

ABSTRACTS

14TH INTERNATIONAL CONGRESS FOR THE STUDY OF CHILD LANGUAGE

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SPECIAL THANKS TO

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SUMMARY



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DAY
1

MONDAY, 17TH

18:00-19:00, **GRAND AMPHI**

PLENARY TALK

Bottom-up and top-down information in infants' early language acquisition

Sharon Peperkamp

Laboratoire de Sciences Cognitives et Psycholinguistique, Paris, France

Decades of research have shown that before they pronounce their first words, infants acquire much of the sound structure of their native language, while also developing word segmentation skills and starting to build a lexicon. The rapidity of this acquisition is intriguing, and the underlying learning mechanisms are still largely unknown. Drawing on both experimental and modeling work, I will review recent research in this domain and illustrate specifically how both bottom-up and top-down cues contribute to infants' acquisition of phonetic categories and phonological rules.

PLENARY TALK

What do the hands tell us about language development? Insights from development of speech, gesture and sign across languages

Asli Ozyurek

Max Planck Institute for Psycholinguistics, Nijmegen, The Netherlands

Most research and theory on language development focus on children's spoken utterances. However language development starting with the first words of children is multimodal. Speaking children produce gestures accompanying and complementing their spoken utterances in meaningful ways through pointing or iconic gestures. Secondly, children learning a sign language use the visual modality (i.e., hands, face and body) to fulfill all linguistic functions at different stages of language development. In this talk I will present recent research on the role visual modality plays both in spoken language development accompanied by gestures as well as in development of sign languages- bringing findings from two fields of research together and how they inform each other. This broader multimodal view shows that expressive affordances of visual modality, allowing for iconic representations and visible indexicality in gesture or sign, provide children alternative routes and stepping stones in language development than speech does alone. I will also show that visual modality might fulfill different functions in language development depending on the language type.

DAY
2

TUESDAY, 18TH

10:30-12:30, GRAND AMPHI

SYMPOSIUM

Tribute to Josie Bernicot: how her reflection will shape the future of developmental pragmatics

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DISCUSSANT: Danielle Matthews, The University of Sheffield, U.K. danielle.matthews@sheffield.ac.uk

Josie Bernicot passed away on May 12, 2015, at 59 years old, after having lived for many years with a neuromuscular disease. She was a generous and passionate scientist and her enthusiasm for research was contagious. Her original way of thinking was a source of inspiration to many colleagues and students and her groundbreaking ideas still greatly contribute to advance the field of pragmatics in language acquisition.

This symposium aims to be a tribute to the original perspective she developed in developmental pragmatics and to show how her thinking still paves the way to future research. Josie Bernicot thought that the key explanation of linguistic knowledge is not to be found in language itself but in the relation between the structure of language and the characteristics of communicative situations. In other words, language knowledge cannot be reduced to grammar. Mastering a language requires being able to adjust linguistic markings to the social context and the goals of the situation at hand. She noted that such a position, "which corresponds to the scientific field of Pragmatics", has implications for how language acquisition in children -- but also at later ages -- is conceived. She applied this perspective not only to typically developing children but also to atypical development in fundamental and applied research. In her last years, she became interested in digital writing and she showed that the practice of text messaging has no influence on the spelling of high school students. This symposium will bring together four researchers, juniors and seniors, who have worked with J. Bernicot both on typical and atypical development and on digital writing. They will put her work in perspective and show how inspiring her thinking was to their own research. The discussant will celebrate

Josie's contribution to the field of developmental pragmatics in language acquisition.

References

Bernicot, J. (1992). *Les actes de langage chez l'enfant*. Paris: PUF.

Bernicot, J. (2014). Bases of linguistic development. In C. Fäcke (Ed.). *Manual of language acquisition* (pp. 143-161). Berlin: de Gruyter.

Matthews, D. (2014). *Pragmatic development in first language acquisition*. Amsterdam/Philadelphia: John Benjamins Publishing Company.

PRESENTATION 1:

Tribute to Josie Bernicot: Gestures and communicative acts in lan- guage acquisition

Michèle Guidetti, CLLE, Université de Toulouse, CNRS & UT2J, France michele.guidetti@univ-tlse2.fr

Children begin to gesture long before talking. Gestures, such as pointing or waving goodbye, constitute the principal means of interacting conventionally with others before the emergence of the lexicon. Children continue to gesture after they start talking, and through to adulthood. Josie Bernicot never worked on very young children or on gestures and multimodal development. But she gave me the opportunity from the moment I started working in her research team to extend and apply the speech act theory she used a lot to study requests, to gestures and communicative development.

I will show in this talk how heuristic this perspective is to study both typical and atypical development in cross linguistic environments. I will also show there still is a lot to be done in order to better understand some key concepts related to gesture and language acquisition, both theoretical and methodological, such as gestures and language acquisition and evolution, multimodal development, form and function in gestures, and gesture classification and terminology. Human communication should therefore be regarded as multimodal, incorporating gestures from the very outset. Multimodality has recently become a subject of interest, stressing the importance of multidisciplinary in order to improve our understanding of human cognition, in both its typical and pathological aspects.

References

Cameron-Faulkner, T. (2014). The development of speech acts. In: D., Matthews (ed). *Pragmatic development in first language acquisition* (pp. 37-52). Amsterdam/Philadelphia: John Benjamins Publishing Company.

Guidetti, M. (2015). Gestures and multimodal communication: developmental and pathological aspects. In: C. Astesano & M. Jucla (eds). *NeuroPsychoLinguistic Perspectives on Language Cognition*. Abigdon: Routledge.

Guidetti, M., Fibigerova, K., & Colletta, J.M. (2014). Gestures and multimodal development: some key issues for child language acquisition. In: M. Seyfeddinipur & M. Gullberg (eds). *From Gesture in Conversation to Visible Utterance in Action*. (pp.351-370). Amsterdam, Philadelphia: John Benjamins Publishing Company.

PRESENTATION 2:

Interactional context, speech acts and meaning in dialogue: how much are they entwined?

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In the French and international scientific landscape, Josie Bernicot was an active promoter of the central position of pragmatics in the study of language acquisition. Her enthusiasm, tenacity and determination allowed the development of a community of scholars, linguists and psychologists. This was made possible because of strong theoretical choices that made her call, in her book on speech acts, for a new kind of psycholinguistics which would consider pragmatics at each level of the production and understanding processes.

For Bernicot, acquisition of language could not be reduced to the acquisition of a system of forms and structures. Children also have to grasp the features of social contexts of language use and learn to map linguistic devices to the features of social contexts. In that way, Bernicot considered pragmatics as an essential dimension of the process of language acquisition.

A superficial reading would suggest that she saw pragmatics as external to language. On one side, language as a formal system, and on the other side, social conditions of use and a socio-cognitive competence linking the one to the other. However, from her early work, Bernicot demonstrated a more complex perspective, adopting, for example, the components of a speech act as a variable to study its acquisition. Moreover, she considered that meaning is built in interaction through cooperation. Therefore, pragmatics cannot be relegated to conditions of use of forms but is part of the linguistic activity.

In this paper, I will examine the implications of her

epistemological choices in the field of pragmatics on language conception in the context of an interactionist approach. I will follow this thread from her early work on speech acts to her more recent studies on repetition through the attention paid to the influence of interactional conditions in structural and functional aspects of language development.

PRESENTATION 3:

Tribute to Josie Bernicot: Pragmatic Disorders across the life span

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Josie Bernicot has devoted much of her research to the pragmatic aspects of language in the atypical development. She first focused on the issue of communication for children with degenerative diseases such as Duchenne muscular dystrophy. Her research has led to the emergence of a neuropragmatic approach when people with right and frontal lesions are concerned. These brain-damages are part of their "invisible disability". Josie Bernicot's research has drawn attention to the need to take them into account in the reeducation process. More recently, she has contributed to refine the pragmatic profiles of children with Williams syndrome and Specific Language Impairment. She has built a number of collaborative relationships with psychologists, linguists, doctors and speech therapists. These pragmatic developmental researches were conducted in a life span perspective with a growing interest in the study of communication in the typical and atypical aging process. In keeping with this interest, she has recently developed a test, the Pragma Test Senior. This test can be used by clinicians to assess various populations with communication impairment (e.g., Alzheimer's and related diseases, semantic dementia, primary progressive aphasia).

References

Broc, L., Bernicot, J., Olive, T., Favart, M., Reilly, J., Quémart, P. & Uzé, J. (2013). Lexical Spelling in Children and Adolescents with Specific Language Impairment: Variations with the Writing Situation. *Research in Developmental Disabilities*, 34, 3253-3266.

Dardier, V., Bernicot, J., Delanoë, A., Vanberten, M., Fayada, C., Chevignard, M., Delaye, C., Laurent-Vannier, A., & Dubois, B. (2011). Severe Traumatic Brain Injury, Frontal Lesions, and Social Aspects of Language Use: A Study of French-Speaking Adults. *Journal of Communication Disorders*, 44, 359-378.

Lacroix A., Bernicot, J. & Reilly, J. (2007). Narration and collaborative conversation in French-speaking children with Williams syndrome. *Journal of Neurolinguistics*, 20(6), 445-461.

Register of electronic communication

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Electronic communication (email, text message, forums, etc.) has developed with Internet. Adolescents seem to have largely appropriated these new communication tools. The study of electronic communication tools is providing new data with which to answer questions regarding language acquisition and use. The appearance of communication technology has caused drastic changes in the modes of interaction used by modern societies. The most predominant characteristic is the use of orthographic forms which differ from those found in traditional writing. In research conducted with Josie Bernicot, we considered electronic discourses as specific register, that is a set of linguistic variations that are context-dependent .

I will show in this talk how this new register of electronic discourses (email and text message) is different from traditional oral communication, and written communication. I will explain methodological design necessary to apprehend these new forms of communication and demonstrate that this register is not stable, and the extremely rapid evolution which it is currently experiencing makes it difficult for researchers to capture. Finally, I will also show there still is a lot to be done in order to improve our knowledge of the written electronic communication. Additional studies will be necessary to take into account the turn-taking sequence in the communication or the social characteristics of the interlocutor.

References

Bernicot, J., Goumi, A., Bert-Erboul, A. & Volckaert-Legrier, O. (2014). How do skilled and less-skilled spellers write text messages? A longitudinal study. *Journal of Computer Assisted Learning*, 30(6), 559-576.

Bernicot, J., Volckaert-Legrier, O., Goumi, A. & Bert-Erboul, A. (2012). Variation in Forms and Functions of SMS Messages: The Case of Adolescents in France. *Journal of Pragmatics*, 44, 1701-1715.

Volckaert-Legrier, O., Bernicot, J. & Bert-Erboul, A. (2009). Electronic Mail, a new written-language register: a study with French-speaking adolescents. *British Journal of Developmental Psychology*, 27, 163-181.



SYMPOSIUM

Language development in children with cochlear implants: From vocabulary in infancy to language processing in the school years

CONVENER: Demuth, Katherine, Macquarie University, Sidney, Australia, katherine.demuth@mq.edu.au

DISCUSSANT: Katherine Demuth

Early language experience shapes the perceptual and processing strategies needed for effective language processing, and early vocabulary size is a strong predictor of later language abilities [1]. This raises many questions about early language development in children with severe to profound hearing loss who are fitted with cochlear implants (CIs), where variable later outcomes are often reported across individuals, some showing more limited lexicons, delayed morphosyntax, poor sentence comprehension, and lack of appropriate discourse/pragmatic interactions compared to peers [2, 3]. However, there is still much that is unknown about the factors that may contribute to individual differences in the language development of children with CIs, and even less is known about their later language abilities. This symposium bringing together recent research by developmental psycholinguists working on both of these issues. The first two studies focus on aspects of the (early and later) lexicon, whereas the last two focus on higher levels of language processing involving prosody – a known challenge for CI users. Study 1 examines very early predictors of vocabulary development in children with CIs. Study 2 explores later aspects of lexical access for production and recognition in school-aged (8-11) children. Study 3 demonstrates that even teens with CIs have slow language processing compared to normal hearing (NH) peers, and that this has major implications for discourse interactions. Study 4 finds that Brazilian Portuguese-speaking children (9-11) with CIs fail to use prosodic cues for attachment in the sentence comprehension. Taken together, these studies point to the importance of early lexical abilities and prosody for later aspects of language processing in children with CIs. This has major implications for early interventions, including early access to speech and

gesture/sign, child-directed speech, therapy during the preschool years, and therapy during the school years, all of which are discussed.

References

Fernald, A. Marchman, V. & Weisleder. (2013). SES differences in language processing skill and vocabulary are evident at 18 months. *Developmental Science* 16, 234-248.

Nittrouer, S., Burton, L. T. (2001). The role of early language experience in the development of speech perception and language processing abilities in children with hearing loss. *Volta Review*, 103, 5-38.

Toe, D. M. & Paatsch, L. E. (2013). The conversational skills of school-aged children with cochlear implants. *Cochlear Implants International*, 14, 67-79.

PRESENTATION 1:

Variability in early vocabulary of children with CIs: the impact of child abilities on outcomes

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There is wide variation in the language of young children with cochlear implants (CIs) [1] and language outcomes in the school years vary [2]. Environmental factors are frequently reported as predictors of early language for CI recipients [3]; less attention has been given to individual differences in other areas of development in infancy. Rather than recruiting children post-implantation, we recruited 35 children prior to implantation (mean age: 10.7 months, range 6 months 10 days - 21 months 13 days, with only 5 >12 months) to identify language trajectories over four years. Using the Bayley Scales-4 (BS-4), assessments of Cognition, Fine and Gross Motor skills and Receptive and Expressive Language were made at the time of recruitment. In six 3-monthly sessions following recruitment, the M-B CDI: Words and Gestures was used as a measure of gesture use and vocabulary development. A negative bimodal model was adopted for data analysis. Following variable selection adjusting for gesture use and the BS-4 measures, Early Gestures and BS-4 Receptive Language were identified as associated positively with Words Produced 12 months post implantation (both p s \leq .001). A second negative binomial model identified that children who took longer to consistently use their CIs said fewer words. Age was not significant. Using the same predictor

variables for Words Produced 3 months later, after variable selection Early Gestures, BS-4 Fine Motor and BS-4 Receptive Language remained and were positively and significantly associated with Words Produced ($p = .001$, $p = .016$, $p < .001$). As found for children with typical hearing, gesture use predicts early words for children with CIs but, additionally, their pre-implant abilities also account for significant variability. As we examine the trajectories of language development in the sample, we will explore the impact of these early predictors on later language.

References

Duchesne, L., Sutton, A., & Bergeron, F. (2009). Language achievement in children who received cochlear implants between 1 and 2 years of age: group trends and individual patterns. See comment in PubMed Commons below *Journal of Deaf Studies and Deaf Education*, 14, 465-85.

Johnson, C., & Goswami, U. (2010). Phonological awareness, vocabulary, and reading in deaf children with cochlear implants. *Journal of Speech and Hearing Research*, 53, 237-261.

Niparko, J.K., Tobey, E.A., Thal, D.J., Eisenberg, L.S., Wang, N-Y., Quittner, A.L., & Fink, N.E. for the CDaCI Investigative Team. (2010). Spoken Language Development in Children Following Cochlear Implantation. *JAMA*, 303 (15). 1498-1506.

PRESENTATION 2:

Lexical access for production and recognition in children with cochlear implants

Richard G. Schwartz, Susan Steinman, Elizabeth Ying, Zara W. DeLuca, Georgia Drakopoulou and Derek Houston

Despite generally normal standardized vocabulary comprehension scores [1], children with CIs have deficits in learning new words [2]. This study therefore used several methods to examine lexical recognition and production in children with CIs and NH peers (8;0-11;0). Auditory priming with lexical decision examined phonological and semantic factors ($n_{NH}=64$ $n_{CI}=30$). Pair members shared an onset or rhyme; half were high phonotactic probability and half were low phonotactic probability (20 pairs per condition). Semantically-related pairs were associates or coordinates. Mixed-effect-model analyses examined the predictivity of demographic factors (CA, implantation age, test scores, speech perception). Children with CIs had lower accuracy and distinct patterns of priming effects. Picture-Word and Picture-Picture-Interference examined production ($n_{NH}=66$ $n_{CI}=27$; $n_{NH}=66$ $n_{CI}=24$). These methods rely on rapid naming of a picture while ignoring an

interfering stimulus (IS—auditory word or superimposed picture). By varying the relationship (phonological, semantic, or none) between the IS and the picture name and varying the SOA, the time-course of semantic or phonological information activation during naming is revealed. NH children exhibited typical patterns of facilitation/inhibition for PWI, and distinct patterns for PPI. CI children exhibited atypical PWI patterns and larger, nearer-to-typical effects for PPI, as expected because of the absence of an auditory stimulus. Although these data are very useful, they are discontinuous. Eye-tracking experiments ($n_{NH}=19$ $n_{CI}=19$) provided continuous moment-by-moment time-course of recognition and production. For production, the child heard a word and then a border appeared around the picture to be named in an array of four. Mouse-click responses indicated recognition. Gaze time-course analyses were used to examine arrays with various phonological and semantic competitor types. CI children exhibited atypical patterns of looks to targets and competitors in various conditions. This will be discussed in terms of on production/recognition comparisons and the predictive nature of demographic variables.

References

Nicholas, J. G., & Geers, A. E. (2008). Expected test scores for preschoolers with a cochlear implant who use spoken language. *American Journal of Speech-Language Pathology*, 17(2), 121-138.

Houston, D. M., Carter, A. K., Pisoni, D. B., Her Kirk, K., & Ying, E. A. (2005). Word learning in children following cochlear implantation. *Volta Review*, 105(1), 41-72.

PRESENTATION 3:

Prosody, processing speech and discourse interactions in adolescents with cochlear implants

Colleen Holt, Katherine Demuth & Ivan Yuen

It has long been reported that children with cochlear implants (CIs) exhibit problems with language processing [1]. If listeners do not have the sensory abilities to perceive prosodic information, understanding discourse structure and meaning is a challenge. This paper presents results of two studies. The first assessed the use of prosodic and contextual cues to focus when identifying target phonemes. Eight prelingually deaf adolescent users of CIs and eight NH peers (aged 13-18 years, mean age at implantation 1.8 years) completed two phoneme-monitoring tasks: a prosodic condition, where the target phoneme was in a focused/stressed word, and a semantic condition, where the previous sentence provide semantic context for

anticipating the focused word. As anticipated, reaction times of the CI group were slower than those of the NH group in both conditions, suggesting slow language processing, even when no discourse was involved. The second study examined the use of discourse strategies and prosodic cues when participating in a referential communication task. Participants were 8 prelingually deaf adolescent CI users and eight NH adolescents (aged 12-14 years, mean age at implantation 2.1 years). Participants were required to direct the interlocutor around a map (MapTask). The use of information requests, directives, acknowledgments and comments was compared between the two groups. The use and magnitude of fundamental frequency (F0) rises on information requests and directives was also compared. The CI users differed from the NH speakers in how they resolved communication breakdown, showing a preference for repeating directives, rather than seeking information. They also produced larger F0 rises on directives than on information requests, a pattern opposite to that displayed by the NH speakers. These differences may stem from difficulty in either perceiving prosodic changes, or understanding how prosody is used to signal discourse, suggesting the need for further research.

References

Geers, A. E., & Sedey, A. L. (2011). Language and verbal reasoning skills in adolescents with 10 or more years of cochlear implant experience. *Ear Hear*, 32(1), 39S-48S.

task. The stimuli were eight base sentences containing a prepositional phrase attachment ambiguity. Prosodic boundaries were manipulated by varying IPh, ip and null boundaries, controlling for F0, component duration, and pauses between components. Psychoacoustic tests that investigated gap detection threshold and frequency discrimination ability on nonlinguistic stimuli were also employed. Unlike NH children, children with CIs did not exhibit an overall effect of prosody on syntactic disambiguation. Nonetheless, children in both groups provided responses consistent with two predictions of the RBH. The ABH did not characterize the syntactic disambiguation of children with CIs. Attachment responses and psychoacoustic measures were not correlated in NH children. In children with CIs, only gap detection thresholds were correlated with attachment responses, despite adequate perception for all prosodic manipulations. Overall, children with CIs did not use prosodic information to disambiguate sentences or to facilitate comprehension of unambiguous sentences. Furthermore, the acoustic parameters that reflected prosodic characteristics at a nonlinguistic level did not explain performance at a linguistic level.

References

Carlson, K., Clifton, C., & Frazier, L. (2001). Prosodic boundaries in adjunct attachment. *Journal of Memory & Language*, 45, 58-81.

Snedeker, J., & Yuan, S. (2008). Effects of prosodic and lexical constraints on parsing in young children (and adults). *Journal of Memory and Language*, 58, 574-608.

PRESENTATION 4:

The effects of prosody on syntactic disambiguation in children with cochlear implants

Talita Fortunato-Tavares, Richard G. Schwartz, Claudia F. de Andrade, Klara Marton, Derek Houston

Manipulations of prosodic structure influence how listeners interpret syntactically ambiguous sentences [1,2.] Until now, sentence comprehension deficits in children with cochlear implants (CIs) have been attributed only to syntax, leaving prosody a neglected area, despite apparent deficits and the crucial role it plays in sentence comprehension. This study investigated prosodic boundary effects on the comprehension of attachment ambiguities in children with CIs and normal hearing (NH) who are monolingual speakers of Brazilian Portuguese (BP) and tested the absolute boundary hypothesis (ABH) and the relative boundary hypothesis (RBH). Relations between attachment and nonlinguistic gap detection and frequency discrimination were also investigated. Fifteen NH children (M = 10;5) and 13 children with CIs (M = 9;9) speakers of BP participated in a computerized sentence comprehension

DAY
2

TUESDAY, 18TH

10:30-12:30,

AMPHI LUCIE AUBRAC

SYMPOSIUM

A new perspective on referentiality in elicited narratives

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The goal of this symposium is to trace the developmental trajectory of referentiality in elicited narratives, to compare TD with SLI children and to find out typological regularities, if any, in the production of referential devices across different languages. While referentiality in elicited narratives has been discussed in numerous publications (Berman & Slobin, 1994, etc.), few studies have so far used picture stories that were controlled for cognitive complexity and for the order of appearance of protagonists. Furthermore, no previous research group has used parallel sets of theoretically-based pictorial stimuli and protocols for narrative elicitation and analyses. This is the empirical and theoretical novelty of this symposium, which uses elicited narratives from *Multilingual Assessment Instrument for Narratives* (MAIN, Gagarina et al. 2012) to answer the following questions: How do monolingual and bilingual TD and SLI children introduce and maintain animate referents? Which regularities can be traced across languages with and without an article system and/or other expression of definiteness? The methodological novelty is grounded in the similarity of data elicitation and evaluation in the two modes of story production – retelling and telling – across all studies of this symposium. Finally, the distinctly set theoretical model of *story grammar* (Stein & Glenn, 1979) and *binary decision tree* (Westby, 2005), which explicitly highlight the *Goal-Attempt-Outcome* episodic organization of stories, allows us to approach the investigation of referentiality in a well-defined clean way.

The symposium brings together 5 studies, investigating bilingual (Swedish-German (TD), Russian-Hebrew and Russian-Greek (SLI)) and monolingual TD and SLI children (Greek, Lithuanian, Hebrew, Russian, South African English) from age 4 to 7. All studies use the same data elicitation method and the same scheme of analyses; one study focuses on the effect of (non)joint-attention methodology of reference production.

Key words: referentiality, narratives, bilingual, monolingual, children

References

Berman, R. A., & Slobin, D. I. (Eds.). (1994). *Relating events in narrative: A crosslinguistic developmental study*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Gagarina, N., Klop, D., Kunnari, S., Tantele, K., Välimaa, T., Balčiūnienė, I., Bohnacker, U., & Walters, J. (2012). MAIN: Multilingual Assessment Instrument for Narratives. *ZAS Papers in Linguistics*, 56.

Stein, N. L., & Glenn, C. G. (1979). An analysis of story comprehension in elementary school children. In R. Freedle (Ed.), *Discourse processing: Multidisciplinary perspectives* (pp. 53-120). Norwood, NJ: Ablex.

Westby, C. E. (2005). Assessing and facilitating text comprehension problems. In H. Catts & A. Kamhi (Eds.), *Language and reading disabilities* (pp. 157-232). Boston, MA: Allyn & Bacon.

PRESENTATION 1:

Character introductions in oral narratives of Swedish-German bilingual children aged 4 and 6

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The aim of this study was to analyze effects of age and language on children's ability to use appropriate referring expressions to introduce story characters. We investigated character introductions in oral narratives of 20 four-year-old and 20 six-year-old Swedish-German bilinguals living in Sweden. This combination of related languages has not been previously studied in children. All children had at least one German-speaking parent, had been exposed to Swedish daily for at least two years, and were able to speak both languages well enough to perform the tasks. One narrative per child in each language was elicited with the Multilingual Assessment Instrument for Narratives (MAIN, Gagarina et al., 2012).

Distributions of different types of referring expressions were analyzed in both languages and age groups. Focus was on the proportions of pronouns and fully appropriate referring expressions for referent introduction, i.e. indefinite NPs. Significant differences between the two age groups were found: The six-year-olds outperformed the four-year-olds, using around 80% fully appropriate (indefinite) NPs

in both languages. The older group used almost no pronouns to introduce the story characters, whereas this was done more often by the younger children. Pronouns were mostly used to introduce the human character, indicating that, in addition to age, animacy plays a role in the choice of referring expressions. Differences were also found between the age groups in the types of constructions used to introduce the characters, e.g. between 'once there was a dog' (full narrative introduction) and 'a dog' (naming). Overall, there were no significant differences between the languages, although relatively large variation was found in the younger group.

The results suggest that the development of referent introduction in bilingual children resembles that of monolingual children, and most importantly, is similar for both languages.

PRESENTATION 2:

Referential cohesion in the narratives of monolingual and bilingual children with typically developing language and with SLI

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The study analyzes the use of anaphoric reference in the narratives of Russian-speaking and Hebrew-speaking monolingual and bilingual preschool children with and without specific language impairment (SLI). Although discourse coherence is universal across languages, referring expressions are language-specific (Gagarina, 2012). Russian and Hebrew both allow null pronouns (Figures 1a & 1b), but differ in pronominal reference (definiteness): Hebrew speakers may use indefinite and definite NPs along with pronouns (Figures 2a & 2b), while Russian has no article for marking definiteness.

Narratives were collected from 89 preschool children (mean age 71.65mo SD 3.06) using a story retelling procedure (*Multilingual Assessment Instrument for Narratives*, Gagarina et al., 2012). Participants included: 20 Hebrew-speaking monolinguals (10 with SLI), 20 Russian-speaking monolinguals (10 with SLI), and 49 Russian-Hebrew bilinguals (14 with SLI). Analyses examined the effects of group (SLI vs. TD), bilingualism (monolinguals vs. bilinguals), and language (Russian vs. Hebrew) on the use of referential expressions.

Preliminary results show that children with SLI overuse pronouns. Narratives of bilingual children

with SLI have ambiguous references in both languages, but fewer ambiguities and more syntactic errors than monolingual children with SLI. More specifically, bilingual children with SLI have difficulty introducing new referents appropriately and refer to more than one antecedent. Story length and complexity influence the use of cohesive devices, and the distance between referent and antecedent is greater in monolingual and bilingual SLI narratives. Bilinguals (both typically developing and SLI) fail to use definiteness in L2/Hebrew. Language differences show more extensive use of pronominals in Hebrew than in Russian.

Results are discussed in light of the role of referential expressions in discourse coherence and in other aspects of narrative macrostructure.

Figure 1. Examples for Null reference in Hebrew (1a) and Russian (1b)

(1a) Null reference Hebrew

ve- az ba kelev amic.
and then came^{MASC} dog brave^{MASC}
ve- Ø hicil exad ha- gozolim
and Ø saved^{MASC} one^{MASC} DEF baby-birds

(1b) Null reference Russian

lisa prygnula
fox jumped^{PF FEM}
i Ø svatila kozlionku [] za nozhki*
and caught^{PF FEM} baby-goat^{DAT} by leg^{ACC}

Figure 2. Examples of Definite marking (2a) and Pronominal reference (2b) in Hebrew

(2a) Definite

pa'am-axat havta ima im shtey gozolim
one-time was^{FEM} mother with two baby-birds
ve- ha- ima barxa
and DEF mother ran-away^{FEM}

(2b) Pronominal reference

ve- ha- ciporim racu gam.
and DEF birds wanted^{PL} also
ve- ha- ima natna lahem
and DEF mother gave^{PF FEM} them

References

Gagarina, N. (2012). Discourse cohesion in the elicited narratives of early Russian-German sequential bilinguals. In K. Braunmüller & C. Gabriel (Eds.), *Multilingual Individuals and Multilingual Societies* (pp. 102-120). Amsterdam: Benjamins.

PRESENTATION 3:**Determiners and Clitics in character reference: A comparison between monolingual and bilingual children with typical development and SLI**

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Russian lacks articles and allows null objects with specific reference. Greek, on the other hand, has definite and indefinite articles whose use is regulated by argument position (Roussou & Tsimpli, 1994), and discourse appropriateness in the referential functions of entity Introduction, Maintenance and Reintroduction. The choice between clitics and DPs in contexts where specific entities are already established in discourse is regulated by the degree of ambiguity created for the listener. The present study attempts to disentangle the effects of cross-linguistic influence from language impairment through investigating the use of D elements in Russian-Greek bilingual children with and without SLI.

Participants were four age-matched groups of 8-year-old children: 34 simultaneous Greek-Russian children with and without SLI, and 34 monolingual Greek-speaking children with and without SLI. Narratives were elicited with the Multilingual Assessment Instrument for Narratives (Gagarina et al., 2012), and were analyzed for grammatical and appropriate use of definite and indefinite articles in DPs, and clitics.

The results demonstrate that both bilingual groups with and without SLI tended to omit articles in obligatory contexts, which indicates an L1-transfer effect. On the other hand, bilingual children with SLI produced more definite DPs in the Introduction function than TD bilingual children, which implies that the former group faced particular difficulty with integrating the pragmatic effects on new/given distinctions associated with the use of indefinite articles in narration. In Maintenance, both groups with SLI produced higher clitic omission rates and grammatical errors on clitics than their TD peers. The findings suggest that while the impact of bilingualism was particularly strong for the categories differently represented in L1 and L2 (like the articles), the impact of SLI was mostly evident on overt pronominalization processes and the use of pragmatic constraints regulating the appropriate use of determiners in the Introduction function.

References

Roussou, A., & Tsimpli, I. M. (1994). On the interaction of case and definiteness in Modern Greek. In

I. Philippaki-Warbuton, K. Nicolaidis & M. Sifianou (Eds.), *Themes in Greek linguistics* (pp. 69-76). Amsterdam: John Benjamins.

PRESENTATION 4:**Referentiality in elicited narratives of Lithuanian TD and SLI preschoolers**

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Referentiality is considered to be one of the main characteristics of a coherent speech. It functions as an introduction of new concepts, a maintenance of foreground, and a reintroduction of concepts (Wong/Johnston, 2004). However, despite numerous studies on reference acquisition, we still lack a "referential profile" of both typically-developing (TD) and specifically language-impaired (SLI) children.

The study examines reference structure in story-telling of Lithuanian monolingual SLI children (n=12, mean age 6;1) and TD children (n=12). The MAIN methodology (Gagarina et al 2012) was employed for narrative elicitation. Since the stories significantly varied in their productivity, only the first three mentions of each character of the stories were selected for analysis. All references were coded as either: noun-phrases; zero-references; demonstrative pronouns; personal pronouns.

In both groups, noun-phrases prevailed among all references, but the distribution of reference types differed between groups. SLI children demonstrated higher individual variability in the reference structure than TDs. Also, a difference between first and non-first mentions was observed. For first mention, only noun-phrases were used by the TDs, but the SLI children produced inappropriate demonstrative pronouns. For second mention, noun-phrases and zero-references were the most frequent in the SLIs, while the TDs used mainly noun-phrases; in both groups a few personal pronouns were also used. For third mention (i.e. character reintroduction), both TDs and SLIs used only noun-phrases and zero-references (except for one SLI who used personal pronouns).

Reference structure in both SLI and TD children might be regarded as incomplete at the age of 6;1. The majority of children employed noun-phrases for first and non-first mentions. However, TDs were at the successful transition from noun-phrase to more elaborated reference types, while SLIs still made cohesion errors which presumably may be caused by lexical limitations.

References

Wong, A. M.-Y., & Johnston, J. R. (2004). The development of discourse referencing in Cantonese-speaking children. *Journal of Child Language*, 31(3), 633–660.

PRESENTATION 5:

When the listener cannot see: referencing in children's stories told to a blindfolded person

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Using a naive listener has become part of standard operating procedures in research on children's narrative abilities. Previous studies (e.g. Kail & Hickmann, 1992) have shown that children are more inclined to introduce referents when listeners cannot see the pictures, or are presumed to be unfamiliar with the content. The purpose of this study was to examine the validity of this assumption in 12 monolingual English speaking children with language impairments, aged 7 to 8 years. The Multilingual Assessment Instrument for Narratives (MAIN, Gagarina et al., 2012) was used to compare listener effects on the children's use of referencing in two parallel stories. As a novel concept, we also conducted focus interviews to ask children about their experiences and perceptions regarding the two listener conditions. A crossover, within-subject, mixed-method design was used to compare the narratives told to a familiar listener, with those that were told to an unfamiliar person who was also blindfolded during the storytelling. The referencing expressions to introduce characters and objects in the MAIN narratives were analysed with the First Mentions measure developed by Schneider and Hayward (2010). As expected from children with language impairments, their narratives indicated problems with referencing, but no significant differences between the two sets of narratives. However, significant interaction effects for order of telling were observed – children who told the narratives first to the naive listener produced less complex stories with fewer referring expressions than when they told the parallel story to the familiar listener. The focus interviews revealed that some children disliked telling stories to a blindfolded person and that they prefer to tell stories to familiar listeners. In contrast

with previous studies, the results indicated that our participants' narratives were similar in terms of referencing and complexity, regardless of listener condition.

References

Kail, M., & Hickmann, M. (1992). French children's ability to introduce referents in narratives as a function of mutual knowledge. *First Language*, 12(34), 73–94.

Schneider, P., & Hayward, D. (2010). Who does what to whom: Introduction of referents in children's storytelling from pictures. *Language, Speech, and Hearing Services in Schools*, 41(4), 459–473.

DAY
2

TUESDAY, 18TH

10:30-12:30,

AMPHI JEAN-BAPTISTE SAY

SYMPOSIUM

Same learning mechanisms – different morphologies: what factors determine learning?

CONVENER: Elena Lieven, University of Manchester, U.K., elena.lieven@manchester.ac.uk

DISCUSSANT: Aris Xanthos, University of Lausanne, Switzerland, aris.xanthos@unil.ch

Children have to learn vastly different linguistic systems. The goal of this symposium is to use crosslinguistic variation to identify the critical factors that allow them to learn any of these systems. We focus on the learning of verb morphology (both what forms children produce correctly and what errors they make) in four different languages, all of which have more pervasive verb morphology than English. Granlund et al. present an elicitation study of children's production of present-tense, person and number marking in Finnish and Polish and investigates whether the pattern of errors can be explained in terms of form frequency and phonological neighbourhood density. Engelmann et al. present a computational model of this learning, which takes as input naturalistic data from CDS corpora of Polish and compares the pattern of learning to that of the children as outlined in Granlund et al. Mazara et al. address the learning of verb morphology in a Tibeto-Burman language where children hear around 23,000 different verb form types in their input. Martin, Bannard and Pine present an experimental study, which uses an 'artificial language learning' methodology to teach Spanish present tense morphology to English-speaking participants, in order to tease apart the roles of frequency and phonology in explaining the pattern of errors found in early child Spanish

The overall aim of the symposium is to address two crucial questions in understanding children's learning: (1) What factors affect the growing productivity of children's morphological systems? and (2) How can we explain the particular pattern of errors made by children learning different languages? Providing answers to these questions across several typologically different languages is critical to

gaining an understanding of language learning that connects the characteristics of the actual language that children hear to the cognitive mechanisms with which it must be learned.

PRESENTATION 1:

Predicting errors in children's production of verb morphology: evidence from person/number marking in Finnish and Polish

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Studies of naturalistic data have suggested that young children acquiring highly-inflected languages do so in a way that is largely error-free. However, overall low error rates in children's production may hide higher error rates in certain parts of the paradigm. To investigate this possibility, the current study elicits children's production of person/number marking in present tense verbs in two morphologically complex languages, Finnish and Polish, which differ in the complexity of the verb inflection pattern. We investigate not only whether children make errors, but also whether input-based accounts are able to predict where in the verb paradigm errors occur.

77 native Finnish-speaking children (mean age: 49.4 months; range: 35-63) and 81 native Polish-speaking children (mean age: 48.7 months; range: 35-59) participated in the study. Children were shown animations of different characters (1st, 2nd, 3rd person; singular and plural) performing various actions, and produced both the pronoun and the inflected present-tense form of the verb. Verbs were chosen across a range of surface form frequencies and from verb classes varying in phonological neighbourhood density (PND), with counts taken from CDS corpora and standard grammar dictionaries respectively.

Analysis with mixed-effects models revealed that, for both languages, despite overall low error rates, children made more errors with verb forms with lower token frequencies in the input (Finnish: $\beta=0.38$, $SE=0.06$, $\chi^2(1)=39.14$, $p<0.0001$; Polish: $\beta=0.26$, $SE=0.05$, $\chi^2(1)=29.47$, $p<0.0001$) and with verbs belonging to

classes with lower PNDs (Finnish: $\beta=0.17$, $SE=0.07$, $\chi^2(1)=5.78$, $p=0.016$; Polish: $\beta=0.21$, $SE=0.07$, $\chi^2(1)=8.36$, $p=0.004$).

These findings suggest that successful models of children's acquisition of verb morphology need to be sensitive to the statistical properties of children's input, i.e., both token frequency (reflecting children's retrieval of individually stored verb forms) and PND (children's use of phonological analogy).

PRESENTATION 2:

The acquisition of verb inflection in a connectionist model

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Recent studies on the acquisition of noun and verb inflection show that, in morphologically complex languages, error patterns are shaped by low-level information in the input. In order to investigate the relation between statistical input properties and error patterns in a purely experience-based learning mechanism, we trained neural network models on the task of producing person/number inflected verbs in Finnish (FI) and Polish (PL) and compared these with experimental results.

Three-layer network models were presented with phonological rePresentations of verb stems (e.g., FI: /roik:u/; PL: /risuj/) together with a code for one target person/number context on the input layer and were trained to produce the complete inflected form on the output layer (e.g., FI: /roikut/; PL: /risuje/ for 2nd singular). In each language, 800 present-tense verbs (FI: 1785 forms; PL: 2419) were presented probabilistically during training according to their token frequencies in child-directed speech corpora. By limiting the intermediate layer to 200 units, the models were forced to generalise rather than rote-learn by extracting morphophonological subregularities.

The models could correctly inflect over 99% of the training tokens after seeing 250,000 (FI) and 500,000 (PL) examples and correctly generalised 90% (FI)

and 96% (PL) of unseen Tokens. Learning in both models was facilitated for highly frequent forms and for verbs with high phonological neighbourhood density (morphophonological analogy). Suffix errors often resulted from overgeneralisation (i.e., producing the correct person/number context but from a different inflectional class) and occasionally from substitutions of low-frequency forms with higher-frequency forms (e.g., producing 3rd singular instead of 1st singular). These results are consistent with our experimental findings.

The results suggest that a common learning mechanism underlies the acquisition of inflectional morphology cross-linguistically, and that this mechanism extracts subregularities in the distributional properties of the input. We discuss differences between the languages and detailed error patterns at different training stages.

PRESENTATION 3:

The acquisition of Chintang verbal morphology

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Does complexity in verbal morphology influence its acquisition? To find out, we compare the acquisition of two languages with different morphology: Chintang (Tibeto-Burman) with 4,745 synthetic verb-forms, English with three forms and a number of irregulars. We report two analyses based on corpora of 4 Chintang children between age 2 and 4;6 (Stoll et al. 2016) and 3 English children between age 2 and 4;11 (Theakston et al. 2001).

Analysis 1 reveals considerable differences in input patterns. Two normalized sub-corpora of child-surrounding speech (96'000 verb-form tokens each) revealed 23,000 different verb-form types in Chintang in contrast to 1,243 in English. As a result, the frequency-rank slope (i.e. log of raw frequency in relation to log of rank) is considerably steeper in English than in Chintang. This implies lower rates of word form repetition in Chintang and therefore an increased learning challenge.

Analysis 2 shows that this challenge is resolved in Chintang by statistical patterns in the input. Chintang verbs fall into two parts with different frequency distributions detectable in the input. Heads include the initial stem in verb-forms and carry structurally independent information, while depen-

dents comprise affixes and secondary stems that provide modifying lexical, derivational and grammatical information. Our results show that children approximate adult performance earlier with heads than with dependents. Age of first production is best predicted by the frequency distributions of heads and dependents in the input, which reveals a steeper frequency-rank slope and therefore better learnability for heads than for dependents. Predictability (i.e. how expectable a head/dependent is given the dependents/head that usually accompanies it) is not a statistically significant factor in the model.

These results suggest that complexity of morphological forms can be acquired by statistical learning alone.

References

Stoll Sabine, Elena Lieven, Goma Banjade, Toya Nath Bhatta, Martin Gaenszle, Netra P. Paudyal, Manoj Rai, Novel Kishor Rai, Ichchha P. Rai, Taras Zakharko, Robert Schikowski & Balthasar Bickel. (2016). Audiovisual corpus on the acquisition of Chintang by six children. Unpublished Electronic Resource.

Theakston, Anna L., Elena V. M. Lieven, Julian M. Pine & Caroline F. Rowland. 2001. The role of performance limitations in the acquisition of verb-argument structure: an alternative account. *Journal of Child Language* 28. 127–152.

PRESENTATION 4:

A training study to establish the cause of children's "defaulting errors" in Spanish

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Support for constructivist models of morphological development comes from the many studies that show a relationship between patterns of errors in child speech and the frequencies of forms in child-directed speech (e.g. Aguado-Orea & Pine, 2015; Matthews & Theakston, 2006; Räsänen, Ambridge & Pine, 2014). Such findings, however, are only correlational. We introduce an experimental approach designed to establish a causal link between linguistic experience and language development.

We test the claim that Spanish children's present-tense errors - specifically their use of the third person singular (3SG) form in non-3SG contexts - reflect "defaulting" to the most frequent verb form. 45 adults and 34 children (aged 9-10) were shown

animations involving different characters (including an animated version of themselves). These were described in Spanish using different person/number forms, which participants were asked to imitate. After 40-80 such training trials participants were shown another sequence of animations and asked to describe them without guidance. The distribution of inflections at training was either skewed toward the 3SG form as in natural Spanish, or was uniform. This was repeated on 3 separate days.

Both adults and children showed greater accuracy on 3SG forms but reduced accuracy on other forms in the skewed relative to the uniform condition, and 3SG substitutions accounted for a significantly greater proportion of errors in the skewed condition. However, 3SG substitutions were also common in the uniform condition, despite there being no frequency bias at training.

These results suggest that the frequency of 3SG forms does affect learning and is likely to play a role in children's "defaulting". However, it is apparently not the only cause, with semantic or phonological factors also playing a role. We are currently exploring an extension of our method in which we decouple phonology and semantics at training in order to distinguish between these two possibilities.

References

Aguado-Orea, J., & Pine, J. M. (2015). Comparing different models of the development of verb inflection in early child Spanish. *PLoS One*, 10(3), e0119613.

Matthews, D. E., & Theakston, A. L. (2006). Errors of Omission in English-Speaking Children's Production of Plurals and the Past Tense: The Effects of Frequency, Phonology, and Competition. *Cognitive Science*, 30(6), 1027-1052.

Räsänen, S. H. M., Ambridge, B., & Pine, J. M. (2014). Infinitives or bare stems? Are English-speaking children defaulting to the highest-frequency form? *Journal of Child Language*, 41(4), 756-779.

SYMPOSIUM

Giving new significance to null results in child language research

CONVENER: Titia Benders, Department of Linguistics, Macquarie University, Australia, titia.benders@mq.edu.au

DISCUSSANT: Suzanne Curtin, Calgary University, Canada, scurtin@ucalgary.ca

A null result in child language research occurs when a study's p -value associated with a linguistic ability stays (well) above the .05 threshold. Null results are inherently ambiguous: is the ability absent, or undetected? This ambiguity is unfortunate, as the true *absence* of linguistic abilities is critical to theories of language development. This symposium provides practical and theoretical discussions of null results, focussing on infant and toddler language development.

Presentation 1 argues that single null results cannot pinpoint the absence or emergence of linguistic abilities. Instead, meta-analyses of effect sizes from published effects and null results highlight gradience. The Presentation will demonstrate the importance of meta-analyses for methodological and theoretical refinement.

Null results are often difficult to publish, which is particularly unfortunate if they replicate across labs. A solution can be collaborative publishing. Presentation 2 presents null results on infant word segmentation across two UK labs, which were collated into one 13-study paper that highlights the impact of input variation on language development. Presentation 3 presents a case of file drawer null results on the emergence of sound symbolism, which are incorporated in a collaborative meta-analysis to reveal a sound symbolism effect in toddlers that is small enough to expect null results in small samples.

Presentation 4 discusses Bayesian statistics as a solution to null result ambiguity. Bayesian statistics let researchers quantify for any given study the evidence that a linguistic behaviour is truly *present* or *absent*, with the added benefit that testing can stop immediately when a publishable result has been obtained. This Presentation will make recommen-

dations on how to switch from p -values to Bayesian statistics.

The discussant will inspect null results through the lens of theories of infant language acquisition, to outline how learning about the true absence of linguistic abilities in children is indispensable for theory development.

PRESENTATION 1:

Tracing the emergence of native-language abilities through combined meta-analyses

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In developmental research, it is crucial for theory building to estimate when abilities emerge (e.g., word segmentation) or decline (e.g., non-native vowel discrimination). To establish emergence, two age groups are typically compared and a nonsignificant result in the younger age group along with a significant outcome for older infants is taken as pinpointing the onset of an ability.

This reasoning is problematic, because nonsignificant outcomes can be due to a number of reasons: 1. The phenomenon is not present in the younger age group – the typical interpretation; 2. Low statistical power, which is likely in infant research as many phenomena result in small behavioral changes (e.g., looking times) and are tested with few participants (e.g., 16-24 per condition); 3. Chance variability, which will lead to non-significant results one in five times even in studies with 80% power, which is typically considered sufficient.

Addressing this issue, we make use of a collection of meta-analyses of phenomena in early language acquisition, from vowel discrimination (native and non-native) to word and concept learning, all freely available at metalab.stanford.edu. We use me-

ta-analyses to aggregate significant and nonsignificant results and trace the emergence and trajectory of abilities, gaining a clearer picture of infant language acquisition across domains. For each dataset, we estimate the size of the underlying effect in the population, taking age into account. While some abilities emerge quickly, others develop slowly; making it difficult to pinpoint the exact age at which the skill emerges. We thus gain a graded picture of language development, moving beyond an all-or-nothing view of infants' abilities. Practically, this quantification allows for more careful experiment planning with estimates of the strength of the effect at different ages and across methods.

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PRESENTATION 2:

A Robust Failure to Replicate Word Segmentation Findings in British English Infants

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The word segmentation paradigm (Jusczyk, Houston & Newsome, 1999) is widely used to examine infants' ability to extract novel words from continuous speech. Jusczyk and colleagues showed that American 7.5-month-old infants can carry out such segmentation. We report on a series of 13 Headturn Preference Procedure (HPP) experiments independently conducted in two British laboratories. The studies were originally designed to test the influence of dialect (US vs. UK as well as different UK dialects) on segmentation, by replicating Jusczyk et al. (1999), while varying e.g., age, Infant Directed Speech (IDS) style, speaker dialect, etc. We expected a mix of success and failure, depending on condition. However, British-English-learning infants (aged 8 -11 months) failed to segment in all but one manipulation, which used a highly exaggerated, atypical British-English IDS. This talk focuses on accounting for the divergence between our results and those from American labs by offering two types of explanations: One methodological and one substantive, based on IDS style in the two cultures.

The two labs conducted their studies independently; both have published successful HPP experiments. We therefore think that these null results are not due to difficulties in conducting HPP studies but are a genuine finding that merits consideration. Subtle differences between methodologies used by different labs (familiarization time, masking material, etc.) may partially account for the differences found between American and British infants. However, British parents also differ from American parents in IDS style (Fernald et al., 1989). This may make British English IDS harder to segment than North American IDS (see also Nazi et al., 2014, for European and Canadian French). British infants may thus face a harder task in breaking into their ambient language than their American peers, which is in line with studies showing that, on average, British toddlers comprehend and produce fewer words.

References

Fernald, A., Taeschner, T., Dunn, J., Papousek, M., de Boysson-Bardies, B., & Fukui, I. (1989). A cross-language study of prosodic modifications in mothers' and fathers' speech to preverbal infants. *Journal of child language*, 16(03), 477-501.

Jusczyk, P. W., Houston, D. M., & Newsome, M. (1999). The beginnings of word segmentation in English-learning infants. *Cognitive Psychology*, 39(3), 159-207.

Nazzi, T., Mersad, K., Sundara, M., Iakimova, G., & Polka, L. (2014). Early word segmentation in infants acquiring Parisian French: task-dependent and dialect-specific aspects. *Journal of Child Language*, 41(3), 600-633.

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PRESENTATION 3:

SymBuki: Making sense of null results in the sound symbolic bouba-kiki effect by means of a meta-analysis

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Evidence that infants and toddlers systematically associate pseudowords such as 'bouba' and 'kiki' with round and spiky shapes, respectively, has been published by several independent research groups (e.g. Asano et al., 2015; Maurer et al., 2006; Ozturk et al., 2013). Yet, other research groups have not found evidence for this early sound-symbolic effect. These individual null results are difficult to interpret: Differences in study design or issues such as low statistical power could have prevented finding an underlying true effect. The present meta-analysis (Symbuki) aims to provide a quantitative and more accurate overview of the emergence of sound symbolism, by integrating published studies and null results that seemed difficult to publish on their own. Symbuki allows a high-powered assessment of the true sound symbolic effect size by pooling over the entire set of 10 extant studies (5 published), entailing data from 816 participants between 4-38 months of age. Moreover, it allows to assess the effect of design choice differences on discrepancies in results.

The quantitative data provide statistical support for a moderate, but significant sound-symbolic effect ($b = 0.198$, $se = 0.079$, $t = 2.51$, $p = 0.021$). Qualitative and quantitative assessments of the relationship between individual effect sizes and design choices (including age) did not reveal any systematic differences between studies that did versus did not find evidence for a bouba-kiki effect.

Our results suggest that the moderate size of the effect, rather than systematic differences in study design, explains discrepancies between the results of individual, relatively low-powered studies: while the average sample size was $n = 19$, power calculations suggest that detecting the effect with 80% power requires around 200 participants. The current meta-analysis leads to a more accurate representation of the bouba-kiki effect, and enables future researchers to better plan and put their study results into context.

References

- Asano, M., Imai, M., Kita, S., Kitajo, K. Okada, H., & Thierry, G. (2015). Sound symbolism scaffolds language development in preverbal infants. *Cortex* 63, 196-205
- Maurer, D., Pathman T., & Mondloch, C.J. (2006). The shape of boubas: sound-shape correspondences in toddlers and adults. *Developmental Science* 9(3), 316-322
- Ozturk O., Krehm, M., & Vouloumanos, A. (2012). Sound symbolism in infancy: evidence for sound-shape cross-modal correspondences in 4-month-olds. *Journal of Experimental Child Psychology* 114(2), 173-186.

PRESENTATION 4:

Bayes(ian statistics) for Babies

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Standard frequentist statistics require testing a pre-determined sample size, computing the p-value, and taking $p < .05$ as publishable evidence for an effect. However, child language researchers may sometimes wish to conclude from their data that children lack a linguistic ability, and/or analyze data after each participant and stop testing at the first publishable test statistic (optional stopping). This Presentation scrutinizes the benefits that child language researchers would gain from switching to Bayesian statistics, and presents Bayesian analysis criteria based on simulations with meta-analyses on infant word segmentation and infant vowel discrimination (Bergmann & Cristia, 2015; Tsuji & Cristia, 2014).

Frequentist null results ($p > .05$) do not distinguish between inability and lack of evidence, which prevents testing theoretical claims about the abilities children do not yet or not anymore possess. Bayesian statistics compare the evidence in favour of children's ability and inability and result in one of three conclusions: C1) children have the ability; C2) children are unable to do it; or C3) there is a lack of evidence for either conclusion. Our simulations provide Bayesian criteria for conclusions about infants' linguistic abilities and inability, based on the typical strength of evidence in word segmentation and vowel discrimination.

When using frequentist effects ($p < .05$) combined with optional stopping, the field will inevitably overestimate abilities, and have no stopping criterion related to inability. Optional stopping with Bayesian statistics allows researchers to interpret evidence for both abilities and inability with the same level of confidence as with a pre-planned sample size (Schönbrodt, Wagenmakers, Zehetleier, & Perugini, 2015). Our simulations show under what conditions Bayesian optional stopping benefits infant language studies, based on the typical sample sizes and effect sizes in word segmentation and vowel discrimination.

References

- Tsuji, S., & Cristia, A. (2014). Perceptual attunement in vowels: A meta-analysis. *Developmental psychobiology*, 56(2), 179-191.
- Bergmann, C., & Cristia, A. (2015). Development of infants' segmentation of words from native speech: a meta-analytic approach. *Developmental science*, 19(6), 901-917.
- Schönbrodt, F. D., Wagenmakers, E. J., Zehetleitner, M., & Perugini, M. (2015). Sequential Hypothesis Testing With Bayes Factors: Efficiently Testing Mean Differences. *Psychological Methods*.

SYMPOSIUM

Perspectives on developmental complexity: syntax and semantics

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The growth of grammatical competence in children involves the production of longer, more complex utterances as the result of grammatical development. To produce complex utterances children must acquire special lexical items, specifically, relational terms that connect constituents such as verbs, prepositions and complementizers, and associated functional morphology. An additional component of the learning task relates to learning the consequences of the mode of composition. Our goal is to meet for an in-depth discussion on what it means to acquire the syntax and semantics of complex phenomena, and how considering the different dimensions of learning (lexical/syntactic/pragmatic) will help us understand the learning problem. The proposed symposium aims to integrate traditional empirical explorations on children's acquisition of structurally complex clauses with an emerging discussion about the nature of complexity, emerging from the subfields of language typology, creoles, and learnability theory. Among the questions we explore are: Why are some forms of structural elaboration more complex than others? Specifically, why are embedded structures complex? Is complexity a property of rePresentations or derivations? How do children learn to semantically integrate embedded structures? Are the effects of complex structure parallel across populations (children vs. adults, monolinguals and bilinguals)?

PRESENTATION 1:

Syntactic complexity and the developing production system

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Although much of the research on children's syntactic knowledge is based on their speech, surprisingly little research focuses on the developing production system itself. This is a significant gap in the field, since we know that some development occurs in this domain. The question is how much of young children's apparent difficulty producing complex structures is attributable to production processes per se.

In addition to a general discussion of theoretical and methodological issues, we report on our ongoing research on children's production of filler-gap structures (McDaniel et al. 2010, McDaniel et al. 2015, McKee et al. 2013). We measure both dysfluency (locations of pauses, and other types of hesitation phenomena) and articulation rate. Not surprisingly, we find that both fluency and articulation rate increase with age. More interestingly, certain patterns of dysfluency and certain rate changes over the course of the sentence are largely the same in 3- to 5-year-olds and in adults. The clustering of empty pauses at clause boundaries suggests that the clause is a major planning unit for children as it is for adults. Both children and adults produce structures with long-distance object extraction less fluently than structures with long-distance subject extraction, which indicates similar planning processes for filler-gap structures. We have also found some age differences. Pauses filled with elements like *um* tend to occur at the beginning of adult utterances, whereas they occur across the utterance for young children. Another difference concerns rate changes over the course of a sentence, which, for adults, depends on the structure; young children tend not to modify rate in this way.

Taken together, our findings suggest that children (at least by age 3) have an architecturally adult-like production system, but they are not as adept at advance planning and adjusting for different syntactic structures. We discuss possible reasons for this development and the ways it might mask linguistic competence.

References

McDaniel, D., McKee, C., Cowart, W., & Garrett, M. F. (2015) The role of the language production system in shaping grammars. *Language*, 91, 415-441.

McDaniel, D., McKee, C., & Garrett, M. F. (2010) Children's sentence planning: Syntactic correlates of fluency variations. *Journal of Child Language*, 37, 59-94.

McKee, C., McDaniel, D., Garrett, M. F., Lozoraitis, C., & Mutterperl, M. (2013) Articulation rate: Effects of age, fluency, and syntactic structure. *Revista de Logopedia, Foniatría y Audiología*, 33, 55-63.

embedding introduces complexity that goes beyond the elements and operations used during the semantic composition of the structure, or the cyclic syntax that generates it. We suggest that complexity should be considered as an emergent property of derivations attributable to external systems interface considerations.

References

Pérez-Leroux, A. T., Castilla-Earls, A., Massam, D., Peterson, T., Béjar, S., & Roberge, Y. (2017). The Acquisition of Recursive Modification in NPs. Ms. University of Toronto.

Roeper, T. (2011). The acquisition of recursion: How formalism articulates the child's path. *Biolinguistics*, 5, 57-86.

PRESENTATION 4:

Syntactic complexity in narratives and sentence repetition: A comparison between bilingual and monolingual children's production

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Language abilities in bilingual development have been frequently measured through vocabulary. However, vocabulary is causally linked to input quantity which is typically lower in bilinguals (Bedore et al. 2012). Syntactic complexity (SC) is thus a promising alternative measure of language ability. SC can be defined as the frequency and diversity of complex over simple sentences (Banney et al. 2015), with further distinctions between subordinate clauses. SC in sentence production can be measured in connected speech (narratives) and sentence repetition (SR) tasks. The role of discourse and conceptualization of sentence meaning differentiates between the two tasks: narratives heavily rely on both while SR minimally. The study's research questions are: (a) Do bilingual children produce sentences with lower SC than monolingual peers, and (b) Do SC scores differ between narrative and SR production in bilingual and monolingual children?

Participants: 120, 8-10 (M.A.:9.4) year-old children (30 Greek-Albanian, 30 Greek-German, 30 Greek-English and 30 Greek monolinguals). Children listened to the Greek adaptation of ENNI stories (Schneider et al. 2006) and were then asked to retell the story to a naive listener. The SR task included a variety of simple and complex structures (COST Action IS0804) and children's performance was evaluated in terms of accuracy of repetition.

Results from both tasks were controlled for vocabulary scores. In narratives, monolingual children had lower SC scores than bilingual groups ($p < .01$), with bilingual children producing significantly more adverbial ($p < .001$) and fewer complement clauses ($p < .05$) than monolinguals. SR results show similar performance between the groups in the use of adverbial and relative clauses, but lower performance of bilinguals in complement clauses ($p < .001$, for all cases). We suggest that the bilingual advantage in the use of adverbial clauses in narratives can be attributed to better discourse management skills, while lower performance in complement clauses in both tasks may be a more direct index of pure language skills.

References

Bedore, L. M., Peña, E. D., Summers, C. L., Boerger, K. M., Resendiz, M. D., Greene, K., & Gillam, R. B. (2012). The measure matters: Language dominance profiles across measures in Spanish-English bilingual children. *Bilingualism*, 15(3), 616-629.

Banney, R. M., Harper-Hill, K., & Arnott, W. L. (2015). The Autism Diagnostic Observation Schedule and narrative assessment: Evidence for specific narrative impairments in autism spectrum disorders. *International Journal of Speech-Language Pathology*, 17(2), 159-171.

Schneider, P., Hayward, D., & Dubé, R. V. (2006). Storytelling from pictures using the Edmonton Narrative Norms Instrument. *Journal of Speech Language Pathology and Audiology*, 30, 224-238.

SYMPOSIUM

What is the relationship between Executive Function and language development?

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DISCUSSANT: Caroline Rowland, Max Planck Institute for Psycholinguistics, The Netherlands, caroline.rowland@mpi.nl

Executive function (EF) is a term used to define the cognitive skills, which enable us to co-ordinate processes and manipulate information and includes: Attention control, Inhibition, Working memory, Planning and Set shifting (Miyake et al., 2000). Studies into typically developing children and those with developmental disorders suggest a strong relationship between language and EF. However it is difficult to separate these out clearly. Bishop, Nation & Patterson (2014) propose three possible causal models between EF and language: 1. Weak EFs lead to language development delay; 2. Language delay leads to weak EF or 3. A concurrent relationship between language skills and EF skills exists but there is no causal relationship. Furthermore, it is not clear what aspects of language or EF have a more or less close relationship with each other. To examine these questions and further our understanding of how EFs might support child language development we present a range of papers in this symposium. Four speakers will explore: how variations in language-input during the earliest stages of development are related to variations in EF in typically developing (TD) children (paper 1), how EF, Theory of Mind and syntax development are related in TD children and children with autism (paper 2). The EF and language link and their relationship with motor skills and school achievement in children with developmental coordination difficulties (paper 3). The final paper argues for a causal role for language in EF development for both children born profoundly deaf and normally hearing children. Presentations by each speaker will be followed by a discussant led synthesis of the evidence by a leading researcher and then an audience led general discussion.

PRESENTATION 1:

Language acquisition and executive function from 12 to 36 months in typically developing children.

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The literature assumes a close relationship between language and executive function (EF) in the early years. However most studies only examine concurrent relationships, meaning that the causal relationship (whether EF is predicated on earlier language skills or vice versa) is still unknown. This is problematic for theories claiming that children's ability to use language to think about, and reflect upon, information underpins the emergence of their EF (e.g. Zelazo & Frye, 1998).

Two recent studies examining causal relationships have reported contradictory findings. Kuhn et al. (2014) found children's communicative ability (before 3 years) predicted later EF (at 4 years), but did not control for EF before 3 years. This means that we cannot rule out an autoregressive explanation, where language effects are nullified once EF is controlled. Gooch et al. (2016) did control for early EF, but found no evidence of causal effects, either of language on EF, or vice versa. However, their participants were older (4-6 years). Since many basic building blocks of language are already present by 4 years, it is possible that the causal relationships are stronger earlier in development.

In this study, we tested children during the period of most rapid language growth – between 18 and 36 months of age. Participants are part of a longitudinal project studying 80 children from 6 months to 54 months of age, recording individual differences in language development, and their predictors, throughout the first five years of life. For this paper, we present results, testing the relationship between language measures (gesture, vocabulary and morphosyntactic growth) between 12 and 30 months of age, and EF measures (sustained attention, working memory, BRIEF-P) at 12, 16, 24 and 30 months. We discuss the implications of the results for theories of language and EF development during the first three years.

PRESENTATION 2:**Complement syntax and Executive Functions: Teasing apart their contributions to Theory of Mind**

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Attributing mental states to others and reasoning on the basis of this knowledge is referred to as Theory of Mind (ToM). Children's performance at 'false-belief' (FB) tasks reportedly relates both to language and Executive Functions (EF), but the contributory role of each is not clearly understood. According to the Linguistic Determinism approach, acquisition of sentential complements such as: John says [that the earth is flat] provides a means to represent people's mental attitudes and accurately perform on FB tasks (de Villiers & de Villiers, 2009). According to the EF approach, FB success relates rather to children holding in memory another's knowledge, switching perspectives and inhibiting prepotent responses (Carlson et al., 1998). A third possibility is that EF and syntax interact, and together influence ToM.

This study investigated the impacts of syntax and EF on ToM. Our participants included 132 children aged 3 to 10 years and 25 children with Autism Spectrum Disorder (ASD) aged 6 to 10 years. ToM was assessed via a ToM-scale with minimal verbal demand, EF via measures of inhibition (Stroop), flexibility (Animal Fluency) and verbal working memory (WM) (nonword repetition), and complementation of verbs of communication via a sentence-picture matching task.

For the TD group, partial correlations controlling for age showed significant correlations between ToM and complements, as well as between ToM and WM and flexibility. Complements were the best predictors for ToM performance compared to WM or flexibility, and these EF skills predicted performance on complements.

In TD, certain EF abilities play a role in syntactic acquisition (King & Just 1991), including complementation, and complementation skills in turn impact ToM development. Results of a follow-up study with children with ASD, will be presented. ASD being a condition often associated with difficulties in FB, EF and language, insights into their patterns of performance may help to shape clinical response.

PRESENTATION 3:**The relationship between language and executive function (EF) in children with typical and atypical motor coordination skills**

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Previous research on the association between language and EF has not fully explored the different impact that verbal and nonverbal domains may have on separate language skills. This relationship has often been studied in isolation, while it is likely to be mediated by the development of other functions such as motor skills. The aim of the current study is to explore whether expressive and receptive language relate to different domains of EF, and if this relationship is comparable in children with typical and atypical motor skills. 151 children aged 7-11 years were assessed on language, reasoning and EF abilities, including a verbal and a nonverbal measure for: working memory, response inhibition, cognitive flexibility, fluency and planning. The study included 71 typically developing (TD) children, and 80 children with poor motor skills who scored below the 15th percentile on a standardised assessment of motor coordination. Hierarchical multiple regression analyses were conducted separately in each group to investigate the relationship between language and EF performance, once age and intellectual abilities were taken into account. Expressive language in TD children was significantly related to verbal response inhibition and verbal planning, whilst receptive language was significantly associated with nonverbal working memory and nonverbal planning. Children with motor coordination impairments demonstrated a significant relationship between verbal fluency and expressive language only. Results suggest that different domains of EF may be related to expressive and receptive language separately. In TD children nonverbal EFs seemed to be specifically associated with receptive language, whereas verbal EFs may be responsible for expressive language only. Results differed in children with poor motor skills, as motor coordination may mediate the relationship between language and EF. Further investigation is underway to explore the role of motor skills in determining this relationship.

PRESENTATION 4:**Language mediates executive function differences in deaf and hearing children**

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Executive function (EF) is a term used to define cognitive skills which enable us to co-ordinate processes and manipulate information. Studies into typically developing children and those with communication disorders suggest a strong relationship between language and EF. However it is difficult to separate these clearly because: 1) Children with communication disorders often have co-morbid cognitive difficulties and 2) EF tasks often involve high levels of verbal content (even when described as non-verbal).

A large group of deaf children aged 5-11 years (n=108) were compared to hearing peers on language and EF (using tasks carefully selected to minimise verbal load). The group was followed up a year later and developmental patterns explored.

At time 1 Our findings show that deaf children performed significantly less well on all EF tasks except design fluency, and differences remained when controlling for general IQ and speed of processing. More deaf children also scored below -1SD and -2SD from the hearing group mean. EF skills related to language in both deaf and hearing groups. However when vocabulary was taken into account, these group differences no longer remained. The reverse pattern did not occur, that is vocabulary differences occurred even when controlling for EF performance. At time 2, autoregressive analyses were performed to explore whether language and EF were predictive of each other over time. Again, time 1 language was found to predict later EF skill, but not vice versa. The mediation of EF performance by language appears to be a developmental pathway. The participation of deaf participants is important because vocabulary is affected by a sensory-environmental factor rather than a neurocognitive deficit.

References

Bishop DVM., Nation K., Patterson K. (2014). Preface. Language in developmental and acquired dis-

orders. *Philosophical transactions of the Royal Society of London. Series B, Biological sciences*, 369

Carlson, S. M., Moses, L. J., & Hix, H. R. 1998. The role of inhibitory control in young children's difficulties with deception and false belief. *Child Development*, 69, 672- 691.

Gooch, D., Thompson, P., Nash, H. M., Snowling, M. J. & Hulme, C. (2016). The development of executive function and language skills in the early school years. *Journal of Child Psychology and Psychiatry*, 67 (2), 180-187.

King, J., & Just, M. A. 1991. Individual differences in syntactic processing: The role of working memory. *Journal of Memory & Language*, 30, 580-602.

Kuhn, L.J., Willoughby, M.T., Wilbourn, M.P., Ver-non-Feagans, L., Blair, C.B., & Family Life Project Key Investigators. (2014). Early communicative gestures prospectively predict language development and executive function in early childhood. *Child Development*, 85, 1898-1914

Miyake A, Friedman NP, Emerson MJ, Witzki AH, Howerter A, Wager TD. (2000). The unity and diversity of executive functions and their contributions to complex "frontal lobe" tasks: A latent variable analysis. *Cognitive Psychology*. 41:49-100

de Villiers, J. & de Villiers, P. 2009. Complements enable rePresentation of the contents of false beliefs: The evolution of a theory. In S. Foster-Cohen (Ed.), *Language acquisition*. Basingstoke, UK: Palgrave-McMillan Press.

Zelazo, P. D., & Frye, D. (1998). Cognitive complexity and control: II. The development of executive function in childhood. *Current Directions in Psychological Science*, 7, 121-126.

DAY
2

TUESDAY, 18TH

14:00-16:00, GRAND AMPHI

SYMPOSIUM

Fluency Bank: Studying typical and disordered speech fluency across languages and contexts

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DISCUSSANT: Brian MacWhinney, Carnegie-Mellon University, U.S.A., macw@cmu.edu

Mastering the skill to produce fluent speech is a complex task that is still poorly understood. Similarly, the threshold at which typical fluency breakdown begins to attract clinical concern is also a matter of frequent disagreement. The goal of the recently funded FluencyBank project, an arm of TalkBank, is to facilitate collection and analysis of expressive speech samples across the lifespan, languages, and clinical diagnoses. Speakers will illustrate the challenges and opportunities available to the study of expressive language development skill. The first speaker (Leclercq) will examine the need for reference data across languages in order to distinguish typical developmental disfluency from stuttering, using data from French. The second speaker (Zwitserslood) will confirm and elaborate on the profile of elevated disfluency profiles in children with SLI, using Dutch data. The third speaker (Byrd) will describe the theoretical and practical challenges of discriminating typical fluency profiles from clinical stuttering in bilinguals, with emphasis on Spanish-English child speakers. The fourth speaker (Ratner) will update information linking language proficiency to stuttering onset and persistence/recovery, showing the complex interactions between speech and language formulation. Each speaker will emphasize the many intertwining skills that underlie the development of spoken language fluency and the benefits of specialized cooperative initiatives such as FluencyBank to collect data for exploration of otherwise impossible to answer hypotheses. Moderator Brian MacWhinney, Co-Investigator of FluencyBank will discuss its development, planned research projects and computational tool development, and illustrate potential applications for use by child language researchers.

PRESENTATION 1:

Using FluencyBank to study speech disfluencies in normally fluent, French-speaking children

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The criterion of 3% of stuttered disfluencies – (part-) word repetitions, sound prolongations and blocks – is often suggested to diagnose the stuttering in children (e.g., Boey et al., 2007; Yairi & Ambrose, 2005). There is a long-lasting debate among scholars about the relevance of considering monosyllabic word repetitions as stuttered disfluencies, given their high frequency in typically developing children (e.g., Howell, 2013; Wingate, 2001). Yet, these are the prime characteristics that prompt identification of early stuttering by parents (Yairi & Ambrose, 2013). Nevertheless, very few normative data exist concerning the disfluencies occurring in the speech of normally fluent children (Tumanova et al., 2014), and none exist in French.

The aim of the present study is to establish normative data concerning the speech disfluencies existing in normally fluent children speaking French at age 4, an age at which stuttering has begun in 95% of children who stutter (Yairi & Ambrose, 2013).

Method: We used the CHAT transcription system and the coding conventions of FluencyBank to transcribe and analyse the speech disfluencies of twenty monolingual, French speaking children who do not stutter, aged 4 years.

Results: As expected, part-word repetitions, sound prolongations and blocks occur less frequently than 3 in 100 words. The frequency of monosyllabic word repetitions is around 2%, with a high variability among children, but most are repeated less than three times and are not tensed.

Discussion: Our results support the need for care when considering monosyllabic word repetitions as stuttered disfluencies. The tension and the number of repetitions should be considered when deciding whether or not a monosyllabic word is stuttered in young children.

References

- Howell, P. (2013). Screening school-aged children for risk of stuttering. *Journal of Fluency Disorders*, 38, 102-123.
- Tumanova, V., Conture, E., Lambert, E., & Walden,

T. (2014). Speech disfluencies of preschool-age children who do and do not stutter. *Journal of Communication Disorders*, 49, 25-41.

Yairi, E., & Ambrose, N. (2013). Epidemiology of stuttering: 21st advances. *Journal of Fluency Disorders*, 38, 66-87.

PRESENTATION 2:

Speech disruptions in school-age children with SLI: a developmental perspective

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Purpose:

This study examined the development of speech disruptions longitudinally in children with specific language impairment (SLI) and typically developing (TD) peers.

Method:

Participants were 30 monolingual Dutch children with SLI, 30 language age-matched (TD-LA) children, and 30 chronological age-matched (TD-CA) children. The SLI and TD-CA groups were aged 8 years at T1, and the TD-LA group was 2 years younger. Speech disruptions were analyzed in narratives for frequencies, types, duration of silent pauses, and syntactic distribution. The task used was the Storytelling Task from the Dutch Language Proficiency Test (LPT; Taaltest Alle Kinderen; TAK, Verhoeven & Vermeer, 2001). The narratives were collected at three points in time (T1, T2, and T3) with 12 month intervals, during a two-year period.

Results:

The SLI group exhibited more speech disruptions than the TD-CA and TD-LA groups at all time points. The three groups did not differ on their use of revisions. Frequencies and types of speech disruptions in the SLI group resembled those in the TD-LA group more than those in the TD-CA group. The distribution of speech disruptions followed the same pattern in all three groups: highest frequencies at utterance-initial position, followed by clause-initial, phrase-initial, and word-initial position. However, the SLI group produced more disfluencies than their TD-CA peers at word-initial positions, suggesting

that difficulty with lexical retrieval may contribute to their disfluency. Over time, silent pause rates steadily decreased in the SLI group, but no changes were observed for the other types of disfluencies.

Conclusions: The findings suggest that, although some improvement in speech fluency is seen, sentence formulation continues to be challenging for school-age children with SLI. The higher speech disruption rates in the SLI group reflect their compromised expressive language skills.

References

Boscolo, B., Bernstein Ratner, N., & Rescorla, L. (2002). Fluency of school-aged children with a history of specific expressive language impairment: An exploratory study. *American Journal of Speech-Language Pathology*, 11, 41-49.

Finneran, D. A., Leonard, L. B., & Miller, C. A. (2009). Speech disruptions in the sentence formulation of school-age children with specific language impairment. *International Journal of Language and Communication Disorders*, 44, 271-286.

Guo, L., Tomblin, J. B., & Samelson, V. (2008). Speech disruptions in the narratives of English-speaking children with specific language impairment. *Journal of Speech, Language, and Hearing Research*, 51, 722-738.

PRESENTATION 3:

Clinical versus typical profiles of speech disfluency: Addressing theoretical and practical challenges

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Disfluencies provide valuable insight into linguistic and motoric effort required for speaking, as expressions such as “word fluency” and “second language fluency” reflect. Disfluencies increase when children attempt utterances at the leading edge of emerging linguistic capacity. Fluency can also reflect underlying speech motor control. With increased linguistic and/or motoric demand, disfluencies increase. Our aim is to distinguish objective and perceptual criteria used to distinguish typical and clinical disfluency.

Method: Language sample analysis and clinical judgments of experts.

Results: In samples from 60 preschoolers, typically-developing Spanish-English bilingual children produced significantly more disfluencies than monolingual peers. These elevated levels of disfluency reflect the navigation of multiple language systems and ensuing demands for timely motor execution. Similarly, in over 100 mono- and bilingual children with language impairment, these children also produce markedly more disfluencies than typically-developing peers. However, disfluency arising from bilingualism or language learning is often hard to distinguish from patterns produced by expressive language-impaired or stuttering children. In a study of clinicians, (14/15) had significant difficulty discriminating typical from clinical speech disfluency in typically-developing mono-/bilingual speakers. This difficulty may be due to the overlap in types and frequencies of disfluencies produced by both groups.

Discussion: We need better criteria to distinguish typical disfluency from stuttering to avoid mis-identification of language impairment or stuttering in children who in fact have neither disorder. Mis-identification can be costly, since educational or therapeutic approaches to these diagnoses have virtually no objectives in common. Clinically, initiatives such as FluencyBank facilitate compilation of reliable, language-specific data that can be used to enhance differential diagnosis in children with fluency concerns. FluencyBank should also facilitate accurate identification of overlapping and distinguishing disfluency behaviors that could serve to demonstrate the relative contributions of linguistic proficiency, linguistic planning, and speech motor control to fluency breakdowns in differing populations.

References

- Rispoli, M., Hadley, P., & Holt, J. (2008). Stalls and Revisions: A Developmental Perspective on Sentence Production. *Journal of Speech, Language & Hearing Research*, 51(4), 953-966.
- Byrd, C. T., Bedore, L. M., Ramos, D., Nippold, M., & Packman, A. (2015). The Disfluent Speech of Bilingual Spanish-English Children: Considerations for Differential Diagnosis of Stuttering. *Language, Speech & Hearing Services In Schools*, 46(1), 30-43.
- Byrd, C., Watson, J., Bedore, L., & Mullis, A. (2015). Identification of Stuttering in Bilingual Spanish-English-Speaking Children. *Contemporary Issues in Communication Science and Disorders*, 42, 72-87.

PRESENTATION 4:

Linguistic predictors of recovery from early childhood stuttering

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A growing body of literature finds subtle linguistic impairment in both children and adults with clinical stuttering; some classic language skills such as nonword repetition may predict risk for persistence. A major limitation of much research in stuttering is difficulty with small sample sizes available for analysis, leading to few longitudinal datasets gathered at great expense. Our aim was to explore the potential of combined datasets and analytical resources to answer questions about underlying language skill in children who stutter, and recent findings that identify syntactic and lexical predictors of stuttering persistence and recovery over the first three years after its initial diagnosis.

Method: In an early proof-of-concept of potential data sharing in fluency research, combining data from four separate research labs isolated differences in procedural and declarative language skills in 62 participants (31 children who stutter and 31 carefully matched peers). Such work has prompted continued cooperation, most recently using TalkBank utilities to generate data for a growth modeling analysis of 74 children, to identify potential factors associated with stuttering risk, persistence and recovery.

Results: Children who stutter show differences in mastery of verb morphology. Children whose stuttering persisted showed significant differences in baseline expressive grammar and its growth over time, as well as lags in expressive vocabulary. Children who recovered from stuttering had stronger grammatical skills at onset, and had vocabulary skill that merged with typical profiles over time.

Discussion: These data provide guidance to future analyses of the power of more intensive language assessment to provide potential prognostic data for families of stuttering children and potential intervention strategies. Both projects exemplify the potential of FluencyBank to foster data collection and collaborative analysis that exploits team strengths, in this case for the prospect of clinical advances in stuttering identification, treatment and counseling.

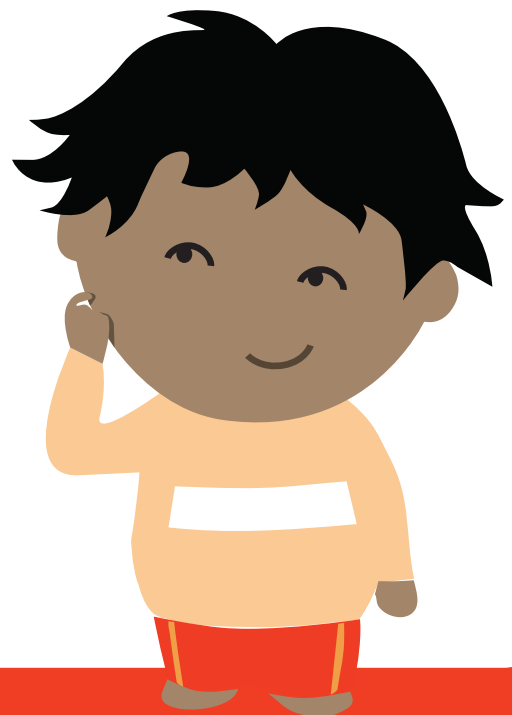
References

- Bauman, J., Hall, N., Wagovich, S., Weber-Fox, C. & Bernstein Ratner, N. (2012). Past tense marking in

the spontaneous speech of preschool children who do and do not stutter. *Journal of Fluency Disorders*, 37(4):314-24.

Leech, K. A., Ratner, N. B. Brown, B., & Weber-Fox, C. (under review). Preliminary evidence that linguistic features in children's expressive language differentiate stuttering persistence and recovery. *Journal of Speech Language and Hearing Research*.

Spencer, C., & Weber-Fox, C. (2014). Preschool speech articulation and nonword repetition abilities may help predict eventual recovery or persistence of stuttering. *Journal of Fluency Disorders*, 41, 32-46.



SYMPOSIUM

Acquisition of case-marking: form and function

CONVENER: Virve-Anneli Vihman, University of Tartu, Estonia, virve.vihman@ut.ee

Case-marking plays a crucial role in signalling syntactic and semantic relations in many languages, yet is absent in others. Moreover, languages which employ case-marking centrally in their grammatical systems exhibit remarkable diversity, in both the “richness” of inflectional paradigms and where the complexity lies, yet children are reported to learn case-marking systems quite early (Slobin 1985). More recently, various approaches have found differences in accuracy both horizontally, across declensional paradigms, and vertically, across cells within a paradigm, depending on frequency of forms (see work cited in Ambridge et al. 2015), typology of the language (Xanthos et al. 2011), and other factors like phonological saliency and functional transparency.

Finding explanations for individual paths to adult-like case-marking, therefore, requires a clear picture of acquisition of the form and function of noun cases within and across languages. This symposium aims to engender discussion around crosslinguistic comparability of the acquisition of a highly variable domain.

The talks draw on corpus and experimental approaches to acquisition of case-marking in Baltic, Finnic and Slavic languages. Three papers present a combination of results from corpus and experimental studies, investigating comprehension of the use of case-marking to signal argument relations in Czech (Presentation 1), factors affecting acquisition of differential object marking in Estonian (2), and effects of frequency and phonological neighborhood on Lithuanian children’s production of case-marked nouns (5). Presentation 3 investigates the effect of lexical and syntactic contexts of case forms in an experimental study with Polish children. Presentation 4 reports on an experimental study with bilingual (Russian-Dutch) children interpreting transitive constructions cued by stress patterns and word order. Together, the talks highlight the variation across (even similar) languages and the importance of gaining a fuller picture of context and level of abstraction in depicting children’s knowledge of morphophonological form and semantic-syntactic function.

PRESENTATION 1:

Interaction of case marking and word order in Czech children’s production

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In Czech, the subject and object status of arguments is marked using case forms. Word order is flexible, but nominative-verb-accusative (SVO) is the unmarked pattern. The existing research suggests that Czech children understand accusative-initial OVS sentences with some delay compared to sentences beginning with nominatives (SVO). This suggests that they understand case marking but have difficulty using it when used in noncanonical word orders. The question is whether the special status of the nominative-initial SVO is reflected in their productions as well.

The key study reported in this paper examined the use of various word orders in spontaneous language transcripts from 62 children aged 30 months (3482 multiword utterances). All utterances containing a verb were coded for verb transitivity, word order, and whether arguments were realized by pronouns or full nouns. The results suggest that children rarely use full transitive sentences with subjects and objects. When they do, they use the canonical word order and avoid the inverted accusative-initial OVS order. However, there are numerous examples of shorter utterances beginning with accusatives (OV) and ending with nominatives (VS). Children thus show good knowledge of case marking and word order flexibility, but they also follow the basic word-order pattern of Czech.

Two subsequent priming experiments (N=40) confirmed the special status of SVO in production. Children did not produce accusative-initial sentences in picture descriptions even after they produced accurate imitations of such sentences as primes. However, they were sensitive to the prime word order, as shown by the greater number of non-target productions after OVS primes. Overall, these results suggest that 3-year-olds can use case forms to mark the syntactic roles of words, and follow distinct word orders in elliptical and pro-drop sentences. However, the sentences with subjects and objects generally follow the nominative-initial SVO pattern.

PRESENTATION 2:**Variability in the input: Acquisition of Differential Object Marking in Estonian**

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This paper investigates the acquisition of case-marking involving syntactically and semantically conditioned functional variation. Differential object marking (DOM) in Estonian is picked up by children early, but the subtle factors involved are not mastered until later. Transitive objects alternate between partitive and genitive/nominative (depending on construction and number). Patterns of DOM in Finnic have been well described (e.g. Kiparsky 1998), but in actual usage, object case is not fully predictable from syntactic, semantic or lexical context, but allows for pragmatic effects and speaker choice (cf Ogren 2015). Hence, this is a fruitful domain for investigating how variation in the input affects acquisition. We asked whether children mirror the relative frequencies of object case with particular verbs in adult speech; and whether children are sensitive to the same factors as those affecting adults' usage.

We present results from a dense corpus study and two experiments testing knowledge of object case alternation among 3 to 5-year-olds. The data in the corpus study consist of 2136 utterances with transitive verbs and overt objects, from a mother and child, at 2 and 3 years. The lexical bias of verbs in CDS to take partitive objects has a more significant effect on the child's use at age 3;0 than 2;0, showing development toward adult-like usage. Co-occurrence with perfective markers, sentence type, and animacy also affect the child's case-marking.

A production study (N=65) and comprehension study (N=41) explored whether 3 to 5-year-old children were more influenced by lexical bias of verbs or semantic aspect (cf Argus 2008, on acquisition of Estonian object case). Three-year-olds and adults reacted primarily to lexical bias, whereas 5-year-olds responded to *both* lexical bias of verbs *and* aspectual semantics of the stimuli. We discuss these results in the light of what trajectories children may follow and how abstract their knowledge may be.

References

Argus, R. (2008). Psühholingvistiline katse eesti keele objekti käändevahelduse omandamise uurimise meetodina. [Psycholinguistic experiment as

a method of studying the acquisition of case alternation of the object in Estonian]. *Emakeele Seltsi aastaraamat*, 54: 22-43.

Kiparsky, P. (1998). Partitive case and aspect. In M. Butt & W. Geuder (eds.), *The projection of arguments*, pp. 265-307. Palo Alto, CA: CSLI Publications.

Ogren, D. (2015). Differential object marking in Estonian: prototypes, variation, and construction-specificity. *SKY Journal of Linguistics*, 28: 277-312.

PRESENTATION 3:**The role of constructions in the acquisition of Polish noun inflections**

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Thanks to a growing body of research, we know more and more about the acquisition of inflections, in particular about the role of frequency and similarity of forms as crucial factors in the process (e.g., Räsänen, Ambridge & Pine, 2016). Little attention has been given so far, though, to the potential role of syntactic contexts in which inflectional forms are used (but cf. Arnon & Clark, 2011). This is an unfortunate gap, since children do not experience inflections in isolation but rather as parts of larger chunks. It can be expected that the emergence of an inflectional schema doesn't depend solely on the properties of stems the child experiences with a given ending (frequency, similarity) but also on the constructions in which the ending is used. This is particularly important in complex inflectional systems, like Polish declension, where the same ending can be used to mark different cases.

We re-examine the data from an elicitation study, in which 49 two-year old Polish-speaking children and 52 three-year-olds produced different case forms of novel nouns. The nouns were presented in dative, locative, or instrumental constructions and either their genitive or nominative form was elicited. Some forms used in the Presentation were syncretic and thus differed only with respect to the context used to introduce them. For both the genitive and nominative, one of two elicitation contexts was used.

We show that both the construction used in Presentation and the construction used in elicitation can affect the provision of correct responses. We also show that, when making errors, children are more likely to use a "wrong-gender" ending for a given noun than a "wrong-case" ending for a given elicitation context, which further supports the role of syntactic context. These findings are important both theoretically and practically, with implications for future elicitation studies.

References

Arnon, I. and Clark, E. V. (2011). Why “brush your teeth” is better than “teeth” -- Children’s word production is facilitated in familiar sentence-frames. *Language Learning and Development*, 7(2), 107-129.

Räsänen, S. H. M., Ambridge, B., and Pine, J. M. (2016). An Elicited-Production Study of Inflectional Verb Morphology in Child Finnish. *Cognitive Science*, 40(7), 1704-1738.

PRESENTATION 4:

The influence of word stress and word order on the comprehension of case in Russian speaking children

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Russian has a rich case morphology; case, gender and number information is marked on the ending, which in many cases consists of a vowel. Whereas stressed vowels are transparent (i.e., endings keep their distinctive features), unstressed vowels are phonetically reduced and may be non-transparent, depending on the vowel and the position relative to the stress. Furthermore, 87% of endings are unclear, making the ‘unstressed’ paradigm even less transparent. Because of the reduction of unstressed gender and case suffixes, gender and case inflections are not easy to determine for children (Smoczyńska, 1985). This study explores the effect of word stress on the comprehension of case in monolingual and bilingual children. Moreover, it aims to clarify whether this interacts with a first noun strategy (VanPatten, 2004).

41 typically developing monolingual Russian (M=4;8, SD=0;8) and 39 Russian-Dutch bilinguals (M=5;0, SD=0;8, AoO to Dutch: M=0;7, SD=0;11) took part in this study. A case comprehension task with 52 fully reversible simple transitive sentences in svo or ovs word order was administered. For each word order condition, half of the nouns had stem-stress and the other half, end-stress. Children heard a sentence and had to select which of two pictures was correct (one match, one mismatch).

Surprisingly, we found no differences between the accuracy of stem-stressed vs. end-stressed nouns, in either svo or ovs sentences (the scores on neuter ovs could not be taken into account due to ceiling scores). Zooming in on strategies, the monolinguals showed no significant differences between svo and ovs comprehension, while bilinguals scored higher on svo than ovs ($Z=-5.124$, $p<.001$). The results of this study indicate that there is no direct influence

of stress on comprehension. In bilinguals, a first noun strategy (svo over ovs reading) was observed.

References

Smoczyńska, M. (1985). The acquisition of Polish. In D.I. Slobin (Ed.), *The crosslinguistic study of language acquisition: The data*. New Jersey/London: Lawrence Erlbaum associates, 595-681.

VanPatten, B. (2004). Input processing in second language acquisition. In B. VanPatten (Ed.), *Processing instruction. Theory, research, and commentary*. Mahwah/New Jersey: Lawrence Erlbaum associates, 5-31.

PRESENTATION 5:

Testing constructivist models of morphological development using case-marking in Lithuanian

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According to recent constructivist accounts of first language acquisition, children’s acquisition of morphology relies heavily on the input, with more frequent forms learned faster, and slot-and-frame patterns based on these forms constructed more readily. Previous studies testing this account have focused on verbs and/or Western European languages such as English, with research into languages with complex noun morphology being largely limited to certain parts of the Polish morphological system (e.g. Dąbrowska, 2004; Krajewski, Theakston, Lieven & Tomasello, 2011).

An experimental sentence completion study tested the full Lithuanian inflectional noun paradigm, which constitutes one of the most complex morphological systems found among the Indo-European languages. Thirty-four monolingual Lithuanian children (aged 4;0-5;5) were tested using both familiar and novel nouns, varying in case, number, declension and frequency. Three major findings emerged. First, errors of case/number/declension marking were neither rare (38% and 53% for familiar and novel nouns respectively) nor distributed evenly across the paradigm. Second, children’s rates of correct production were positively correlated with the input frequency of the target noun form (for familiar nouns), and with the phonological neighbourhood density of the noun (for both familiar and novel nouns). Third, the majority of children’s errors involved the production of a noun form with higher input frequency than the target form.

These findings were further supported by the analysis of eleven hours of naturalistic recordings of one Lithuanian girl aged 2;6. In line with constructivist predictions, there were large differences in different case/number/declension frequencies, error rates and their distributions. The overall error rates were 8% for tokens and 10% for types, with plural number and less frequent declensions showing higher error rates. Interestingly, most errors were found with medium-frequency cases, suggesting the child was already productive with high frequency cases, and still relying on rote-learned forms for the low frequency cases.

References

Dąbrowska, E. (2004). Rules or schemas? Evidence from Polish. *Language and cognitive processes*, 19(2), 225-271.

Krajewski, G., Theakston, A. L., Lieven, E. V., & Tomasello, M. (2011). How Polish children switch from one case to another when using novel nouns: Challenges for models of inflectional morphology. *Language and Cognitive Processes*, 26(4-6), 830- 861.

DAY
2

TUESDAY, 18TH

14:00-16:00,

AMPHI LUCIE AUBRAC

SYMPOSIUM

The effects of conversation on the content and linguistic form of narratives

CONVENER: Edy Veneziano, Université Paris Descartes & CNRS, Laboratoire MoDyCo & LPPS, France, edy.veneziano@parisdescartes.fr

A large body of research shows that children's narrative skills are good predictors of school achievement as well as language, literacy and inferential abilities. It is also known that the practice of everyday conversation with expert speakers provides highly favorable settings in which children can acquire grammatical and pragmatic knowledge.

The papers of this symposium, each in its own domain of study, focus on the impact that conversational functioning has on adults' storytelling and on children's narrative skills. To better capture the effects of conversation on narratives, the studies deal with different settings, typically-developing and atypical children (with SLI or ASD), and different languages.

The first paper focuses on the way scaffolding processes affect French-speaking mothers' choice of referential expressions in the stories they narrate to their 5- to 7-year-old children in comparison to adult controls. The second paper examines the different ways in which French- and Italian-speaking mothers respond to their 5- to 7-year-old children's explanations in two different settings, joint storytelling and collaborative free play. Both studies also compare mother-child interaction with typically-developing and with language-impaired children.

The third paper focuses on the effects of repeated conversations about a story mothers read to their 4- and 5-year-old Hebrew-speaking children on the transmission of socio-emotional and cultural knowledge.

The last two papers, using a pre-post within-subject design, focus on the effects of a conversation about the causes of the story events on the contents and linguistic structures of French-speaking children's monological narratives. The fourth study compares 5- to 8-year-old typically developing chil-

dren to a control group who did not participate in the conversation, while the fifth study compares high-functioning children with ASD to matched typically-developing controls.

A time slot will be devoted to discussion with the public and among the participants.

Keywords: Narratives, conversation, adult-child interaction, narrative content, linguistic forms

PRESENTATION 1:

Models of reference in narratives: Comparing the choices of referring expressions by mothers in conversation with their children, typically developing or with SLI, and by control adults.

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Children become skilled narrators through their experience of narratives in family interactions. While several studies have explored the influence of joint storytelling on structural aspects of narratives, few have focused on the referential dimension. Yet, mastering reference in narratives is a long process. For instance, children's use of anaphoric strategies and sensitivity to the absence of shared knowledge, occur only after 9 years. This process takes place less smoothly and more slowly in children with SLI.

Children's referring expressions (RE) are usually assessed in terms of 'canonical' adult models drawn from experimental settings. However, these models are far from being the sole or most frequent models children experience in family interactions.

This paper examines the models of reference mothers actually offer to their children in naturally occurring joint storytelling.

The participants of the study were 15 mothers of TD children, 15 mothers of children with SLI (children's age: 5-7 yrs. in both groups), and 15 control adults (CA). They told the same story based on a wordless picture book. Referring expressions were analyzed according to several dimensions: the animate or inanimate status of the referent, the grammatical category of the RE (e.g. pronoun, noun), its position in the referential chain (first or subsequent mention, reactivation), and the relation between the RE and its interactional function (e.g., questioning, attention getters).

Compared to CA, both groups of mothers used a wider range of RE in the different positions of the referential chain. Moreover, mothers relied more often on shared knowledge and used specific devices, such as interrogative pronouns, dislocations and cleft constructions. These differences can be explained by the conversational dynamics of each dyad and the kind of scaffolding mothers displayed.

The discussion will deal with the way scaffolding affects the choice of referring expressions in storytelling this determining the referential models children experience in the narratives they hear.

References

Bamberg, M.G.W. (1987). *The acquisition of narratives: learning to use language*. Berlin: Mouton de Gruyter.

Hickmann, M., Schimke, S., & Colonna, S. (2015). From early to late mastery of reference: Multifunctionality and linguistic diversity. In L. Serratrice & S. Allen (Eds.), *The Acquisition of Reference* (pp. 181 - 211). Amsterdam, NL: John Benjamins.

Thordardottir, E. T., & Namazi, M. (2007). Specific language impairment in French-speaking children: Beyond grammatical morphology. *Journal of Speech, Language, and Hearing Research*, 50, 698-715.

PRESENTATION 2:

Mothers' reactions to children's explanations in narrative and free-play setting: A study of conversations with SLI and TD children aged 5 to 7 years

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Explanations are a central and essential component to the production of appropriate narratives. However, while feedback strategies, such as recasts, have been found effective for grammatical interventions (Cleave et al., 2015), less is known about the effectiveness of these strategies to scaffold pragmatic skills such as explanations.

The aim of this study is to start filling this gap by describing the different responses mothers provide to their children's explanations. To have a better understanding of mother-child conversational functioning around explanations, two settings were compared: storytelling and collaborative free-play.

Participants were 54 mother child-dyads (34

French-speaking and 20 Italian-speaking). Children were 5 to 7 years old. Half of the mother-child dyads included a child with SLI (17 French-speaking and 10 Italian-speaking) and were matched in age and gender to dyads where the children were typically developing (TD).

Coding of behaviors, enriched by a binomial logistic regression analysis, revealed that mothers were more likely to respond to explanations in the narrative than in the free-play setting, in particular to explanations relating to the story plot. During the free-play activity, mothers, and particularly mothers of children with SLI, were more likely to respond to the explanations they themselves explicitly solicited. No effect of language was observed. Moreover, results showed that mothers' responses consisted mostly in the explicit acceptance of both the content and the linguistic form of children's explanations. However, mothers of children with SLI provided recasts of the linguistic form significantly more often than mothers of TD children.

We argue that the use of both quantitative and fine-tuned qualitative analyses allows a better understanding of the contribution of conversational exchanges to the development of explanations and of storytelling skills in children.

The clinical implications of these results for naturalistic interventions focusing on discourse and pragmatic skills will be discussed.

References

Berman, R., & Slobin, D.I. (1994). *Relating events in narrative: A crosslinguistic developmental study*. Hillsdale, NJ: Erlbaum.

Cleave, P. L., Becker, S. D., Curran, M. K., Van Horne, A. J. O., & Fey, M. E. (2015). The efficacy of recasts in language intervention: A systematic review and meta-analysis. *American Journal of Speech-Language Pathology*, 24, 237-255.

Donaldson, M. L., Reid, J. & Murray, C. (2007). Causal sentence production in children with language impairment. *International Journal of Language & Communication Disorders*, 42, 155-186.

PRESENTATION 3:

The effects of repeated book reading conversations: A study of Hebrew-speaking mother-child dyads

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Repeated storybook readings to children pro-

vide parent-child dyads opportunities to talk about relevant topics, relationships and emotions as well as opportunities to foster children's ability to function as partners in conversations. This study thus examines the characteristics of mother-child conversations during and after shared book reading of the same book, held three times over a two-week period.

Participants were 50 mother-child dyads. Children's age was around 4 to 5 years. The conversations during and following the three readings were videorecorded, transcribed and analyzed.

Results show that during the first session, mothers focused on the book's plot, while during the second and third sessions, more socio-emotional aspects of the story were discussed. Repeated readings thus encouraged mothers to initiate conversations that moved from the perceptible to the underlying layers of the story.

Analyses further reveal that children participated more actively in the conversations during the second and third reading sessions. During these conversations, children talked more about the relationships between the characters and their feelings than in the conversation of the first session.

In the conversations that followed the readings mothers were able to free themselves from the constraints of the text: They went back to the plot to analyze it, taught morals, and focused on the emotional and social aspects of the story.

Results also show stability in mother-child discourse style across the three sessions, such that mothers and children who conversed more during the first book reading continued to converse more during the subsequent readings.

It is argued that repeated joint conversations about book reading provide privileged opportunities for parents and children to jointly discuss socio-cultural knowledge and rules on various levels.

References

Adamson, M. L. B., & Deckner, D. F. (2005). As stories become familiar: mother-child conversations during shared reading. *Merrill-palmer Quarterly*, 23, 389- 406.

Mcdonnell, S. A., Friel-Patti, S., & Rollins, P. R. (2003). Patterns of change in maternal- child discourse behaviors across repeated storybook reading. *Applied Psycholinguistics*, 24, 323-341.

Ratner, N. K., & Olver, R. R. (1998). Reading a tale of deception, learning a theory of mind? *Early Childhood Research Quarterly*, 13, 219-239.

PRESENTATION 4:

The effects of a short conversational intervention on the content and the linguistic structure of 5 to 8 years old French-speaking children's monological narratives

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It has been shown that after children participate in conversations about story content, they can tell more coherent narratives containing more inferential aspects such as explanations of events and behaviors, and references to the characters' internal states.

The present study aims to 1) confirm these results in a large within-subject design study where French-speaking children tell monological narratives on the basis of a wordless five-picture story, before and after participating in a short conversational intervention (SCI) with an adult; 2) evaluate whether children can not only improve the content of their stories but also use more elaborate syntactic structures to express it.

Could the developmental patterns drawn from studies on children's single narratives be newly fed by data emanating from children's narratives told after a conversational intervention?

Participants were 84 French-speaking children between the ages of 5;6 and 8;8 years, 28 respectively in kindergarten, 1st and 2nd grade. Each child was presented with the five wordless pictures of the "Stone Story", interpretable as a story of a misunderstanding between two characters. The child's first narrative was produced after the pictures were removed and were thus not visible anymore. Then, each child participated in a short conversation around the causes of the story events. Following that, the child narrated again the story on the basis of the same pictures (the second narrative).

Results confirm improvements in the inferential content of the second narrative. Moreover, also children's linguistic expression changed. Second narratives contained more linguistic markers and the complexity of the syntactic constructions used increased, particularly in the narratives of 1st and 2nd graders.

The discussion will focus on the relationship between content and its linguistic expression, on *knowing* and *using* one's knowledge, and on

the relation between the intervention procedure and inter-individual variation in cognitive processes.

References

Bamberg, M., & Marchman, V. (1991). Binding and unfolding: Towards the linguistic construction of narrative discourse. *Discourse Processes*, 14, 277–305.

Berman, R., & Slobin, D.I. (1994). *Relating events in narrative: A crosslinguistic developmental study*. Hillsdale, NJ: Erlbaum.

Silva, M., Straesser, K., & Cain, K. (2014). Early narrative skills in Chilean preschool: Questions scaffold the production of coherent narratives. *Early Childhood Research Quarterly*, 29, 205-213.

PRESENTATION 5:

The effects of a short conversational intervention on the narrative skills of high-functioning children with ASD and matched typically-developing children.

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Previous studies have shown that, even with relatively advanced verbal skills, children with Autism Spectrum Disorder (ASD) often produce shorter and less coherent narratives, with fewer explanations and references to the mental states of the characters than typically-developing (TD) matched children.

The present study aims to investigate whether a short conversational intervention focused on the causes of the events, and already proved useful for typically-developing children, could also help children with High functioning ASD (HFA) to improve the causal and mind-oriented contents, as well as the linguistics structure, of their narratives.

Participants in the study were 26 French-speaking children aged 8;6 to 11;8, 13 with HFA and 13 TD matched controls. The children were confronted with the five wordless pictures of the “Stone Story”, interpretable as a story of a misunderstanding between two characters. Children told their stories before and after a short conversational intervention where the ‘experimenter’ asked the child questions about the causes of each of the main events of the story.

Results showed that both groups considerably improved the overall coherence of their second monological narrative, both at the descriptive and at the inferential levels. In particular, all children provided more overall explanations and attributed more internal states to the characters, also as explanations of the events, though children with HFA did this to a lesser degree than TD children.

With the new causal and mind-oriented contents, children’s narratives produced after the conversation also contained more linguistic markers and presented more inter-clausal relations.

The discussion will focus on the socio-cognitive processes underlying these findings, as well as on their implications for future research and educational practices.

References

Colozzo, P., Morris, H., & Mirenda, P. (2015). Narrative production in children with autism spectrum disorder and specific language impairment. *Canadian Journal of Speech-Language Pathology & Audiology*, 39, 316-332.

Eaton, J. H., Collis, G. N. & Lewis, V. A. (1999). Evaluative explanations in children’s narratives of a video sequence without dialogue. *Journal of Child Language*, 26, 699-720.

Stirling, L., Douglas, S., Leekam, S., & Carey, L. (2014) The use of narrative in studying communication in Autism Spectrum Disorders: A review of methodologies and findings. In J. Arciuli & J. Brock (Eds.), *Communication in Autism* (pp. 171-215). TILAR Series, Amsterdam, NL: John Benjamins.

DAY
2

TUESDAY, 18TH

14:00-16:00,

AMPHI JEAN-BAPTISTE SAY

SYMPOSIUM

Cooperative communication in peer interactions

CONVENER: Bahar Koymen, University of Manchester, U.K., bahar.koymen@manchester.ac.uk

DISCUSSANT: Serratrice, Ludovica, University of Reading, U.K., l.serratrice@reading.ac.uk

Human communication is inherently cooperative (Clark, 1996; Tomasello, 2008). Children learn to be cooperative communicators through their interactions with others. However most of the research in the field of child language acquisition focuses on children's interactions with adults, who often tailor conversations according to the needs and desires of the child. On the other hand, peers are less accommodating partners, as they do not provide much scaffolding for one another. Thus, children could potentially learn more from peers than adults in terms of becoming cooperative communicators (e.g., coordinating actions, decisions with others). In fact, Kruger and Tomasello (1986) showed that when pairs were asked to cooperatively solve problems, 7- and 11-year-old children were more responsive to their partners and produced more arguments when they interacted with their peers than when they interacted with their mothers. Yet, there is still not much known how young children interact with their peers and how this influences their linguistic and communicative development.

In this symposium, we will investigate how children (between 3 to 7 years of age) engage in cooperative communication and jointly solve problems with their peers. The first paper will investigate how children spontaneously create and transmit novel communicative signals to solve coordination problems. The second paper will investigate how children seek the cooperation of their peer partners to deceive an adult experimenter through eye gaze and various other communicative cues. The third paper will investigate how children phrase their justifications for their proposals differently when they are cooperating vs. competing with their peer partners to reach joint decisions. The fourth paper will look into how children's cooperative problem solving facilitates their production of meta-talk (talk about evidence and its reliability) in peer conversations.

Altogether, this symposium will shed light into how children learn to become cooperative communicators in their peer interactions.

References

Clark, H. H. (1996). *Using language*. New York, NY: Cambridge University Press. doi:10.1017/CBO9780511620539

Kruger, A. C., & Tomasello, M. (1986). Transactive discussions with peers and adults. *Developmental Psychology*, 22(5), 681. <http://doi.org/10.1037/0012-1649.22.5.681>

Tomasello, M. (2008). *Origins of human communication*. Cambridge, MA: MIT Press

PRESENTATION 1:

Creating a language: Non-linguistic communication among preschool peers

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Children acquire language at an extraordinary speed with the help of adult speakers. But are children also able to create their own language? In peer interactions, children cannot rely on adult scaffolding but have to find their own solutions together with a partner at eye level. In this study, we investigated how dyads of 4- and 6-year-old children spontaneously create and transmit novel communicative signals to solve a coordination problem. Children played a game in which one child had to communicate to the other which of 5 pictures needs to be selected. Four pictures depicted actions (e.g. eating) and one picture was blank ("nothing"). Each child was in a different room and communication was possible via an audio/video connection (akin to a Skype conversation). At some point during the game, the experimenters switched of the audio connection so that children could no longer hear one another but were still able to see each other. To continue the game, children had to spontaneously create gestures to communicate the content of the pictures to their partner. With this setup we wanted to address the following four questions: 1) Do children spontaneously create gestures to communicate? 2) Are they able to create gestures for abstract concepts ("nothing") 3) Do they converge on the same gestures? 4) Do gestures become more abstract over time? Similar processes have been observed in more naturalistic settings, most promi-

nently in Nicaraguan Sign Language (Senghas, Kita, & Ozyurek, 2004). Our results show that 6-year old peers spontaneously create and understand gestures for actions as well as for abstract concepts. Further analysis will investigate whether children also converge on the same gestures and whether gestures become more abstract over time. Ongoing data collection with 4-year olds will serve to illuminate the developmental origins of these processes.

References

Senghas, A., Kita, S., & Ozyurek, A. (2004). Children creating core properties of language: Evidence from an emerging sign language in Nicaragua. *Science*, 305(5691), 1779-1782. doi:10.1126/science.1100199

PRESENTATION 2:

Nonverbal markers of collaborative lying in a dyadic context

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We examined nonverbal markers of spontaneous co-lying in preschool-aged peers in dyadic context. Ninety same-sex pairs of 4- to 6-year olds who knew each other (Mage = 64.18 month, SDage = 9.32) were observed in a modified resistance-to-temptation paradigm, where they were prohibited from touching attractive toys placed in a corner. The peer dyads were left alone in the room, and then later, they were interrogated by the adult experimenter simultaneously. Several response characteristics of children were coded right after the target question ("Did you touch the forbidden toys when I was not here?") and during the interrogation phase. The findings showed that truth-telling children were almost 3 times faster to respond to the experimenter than lie-telling children. Moreover, the odds of having an overlap with the peer during responding were 2.56 times higher for truth-tellers than lie-tellers. The odds of not gesturing during responding and giving verbal response were 4.21 and 9.09 times higher for lie-telling than truth-telling children. While there was no association between being lie-vs. truth-telling and gazing at the experimenter or other places during responding, the odds of gazing at the peer during responding were 6.22 times higher for lie-telling children than truth-tellers, and this pattern was specific to the time right after the target question, as there was no association between gazing at the peer during the rest of the interrogation phase and being a lie- or truth-teller. These findings indicate that lie-telling children could be distinguished from their truth-telling counterparts from their collaborative behaviors (i.e., minimized

gesture use and giving verbal response). More importantly, lie-telling children appear to search for communicative cues (demonstrated by their later responding and gazing at the peer) to coordinate joint action in responding in dyadic context

PRESENTATION 3:

Children produce justifications according to their pragmatic goals in peer conversations

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Providing justifications for actions is a core aspect of joint decision-making with partners. We report two studies that demonstrate how 5- and 7-year-old peers produced justifications for partners in a cooperative or a competitive context. In both studies, pairs of 5- and 7-year-old peers were asked to build a zoo together and to jointly decide on where to place several toy animals. Each child owned one half of the zoo. In the cooperative condition, both children would get rewards if they found a nice home for every animal, and in the competitive condition, the child with more animals on their side of the zoo would get the reward. In Study 1, children in the cooperative context produced not only more justifications, but also more "two-sided" justifications favoring both their own part of the zoo and that of their partners. Moreover, in the competitive context, 7-year-olds relied on both affirmations (explaining "why") and refutations (explaining "why not") in favor of their cages, whereas 5-year-olds only relied on affirmations in favor of their cages. In Study 2, we controlled children's knowledge for a set of justifications. Each child had a different cage, which had three unusual objects (e.g., an alarm clock). One child received training before playing with their peer, learning three critical justifications for animals (e.g., "The bear goes to the alarm clock because it hibernates in winter"). Critically, reproducing the trained arguments would benefit the speaker only in the cooperative condition. Seven-year-olds reproduced these "trained" justifications significantly more in the cooperative condition than in the competitive condition, whereas 5-year-olds did not distinguish between conditions. The results suggest that 7-year-olds are able to use more advanced justifications (refutations) and use these justifications more strategically than 5-year-olds. Overall, cooperative contexts provide a more motivating context for children to produce justifications.

PRESENTATION 4:

Joint decision-making facilitates children's reasoning with peers

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Providing explanations about information reliability is an advanced meta-argumentative skill, which has only been observed in the discussions of adolescents (Kuhn, 2001). In two studies, we investigated how 3-, 5-, and 7-year-old children evaluate and provide explanations about information reliability while reaching joint decisions with peers. In study 1, pairs of 5- and 7-year-olds were presented with a novel animal with unique characteristics (e.g., eating rocks). Each child within a pair learned about the animal individually by watching a video clip. In the key condition, the unequal reliability condition, children received conflicting information about the animal (one child learned that it eats rocks; the other sand) from unequally reliable sources (one child heard a first-hand report; the other a second-hand report). In the equal reliability condition, children received conflicting information from equally reliable sources. In the same information condition, children received the same information from unequally reliable sources. Later, each pair jointly decided on the three things out of six that the animal needed (e.g., choose sand or rocks). Both age groups favored the items supported by the first-hand report in the unequal reliability condition (also in the same information condition); whereas they did not favor one set of items over the other in the equal reliability condition. Moreover, for both age groups, the two conditions with conflicting information elicited more explanations about information reliability than the same information condition. Overall 7-year-old pairs produced more meta-talk (talk about evidence and its validity) than 5-year-olds did. In study 2, in a modified version of the key condition, 3-year-olds were at chance in choosing the right items supported by first-hand report. These results support the view of children's joint reasoning as a fundamentally cooperative enterprise aimed at making jointly rational decisions, and this ability emerges only in the late preschool years.

References

Kuhn, D. (2001). How do people know? *Psychological Science*, 12, 1–8. doi:10.1111/1467-9280.00302



SYMPOSIUM

Child-external and child-internal factors in the acquisition of Catalan in a multilingual constellation: 2L1, 3L1 and child L2 in the context of societal bilingualism

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PRESENTATION 1:

Optionality in sequential bilingualism: production of Catalan adverbial clitics by children of different L1s

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Few studies have addressed the acquisition of adverbial clitics (Gavarró et al. 2010, L1; Perpiñan 2016, adult bilinguals) and, to our knowledge, none have tested them in child L2 acquisition (or sequential bilingualism). L2 learners seem to acquire the syntactic properties of clitics (Ivanov 2009), whereas the syntax-pragmatics interface properties involved in CLLD constructions result in optionality (Valenzuela 2006; but see Slabakova et al. 2012). It has been claimed that the sooner a child is exposed to a new language, the more native-like the language system will be (Meisel 2011). Here we focus on child L2 acquisition of Catalan adverbial clitics by French and Portuguese children immersed in Catalan in Andorra. Crucially, French has analogous forms for Catalan adverbial clitics, whereas Portuguese does not, so different crosslinguistic effects are expected.

Forty-three L1 Portuguese and L1 French children and 25 native controls (9-12 years) participated in two production experiments, one focusing on syntax and one on the discourse-sensitive properties (CLLD) of adverbial clitics (locative *hi* and partitive *en*); accusative and dative clitics were included as control items.

As for syntax, all groups behaved similarly when producing partitive *en* and locative *hi* with a high rate of omission even among controls, which is typical of language contact situations. Regarding CLLD constructions, Portuguese children differed significantly from controls for partitive *en*, whereas French children patterned with natives in both clitics suggesting transfer of L1 features. All groups performed better with control clitics. We conclude that a difference among clitics is revealed (hierarchy of difficulty: ac/dat > en > hi) with a vulnerable locative *hi*; differences between syntax and interface properties only appeared with partitive *en*. The results from the control group suggest internal language change (Perpiñan 2016) that makes L2 input variable and, together with L1 influence, impacts child L2 acquisition (Unsworth 2016).

References

Gavarró, A., Torrens, V., & Wexler, K. (2010). Object clitic omission: two language types. *Language Acquisition*, 17(4): 192-219.

Ivanov, I. (2009). *Second Language Acquisition of Bulgarian Object Clitics: A Test case for the Interface Hypothesis*. Doctoral dissertation. Iowa: University of Iowa.

Meisel, J. (2011). Bilingual language acquisition and theories of diachronic change: Bilingualism as cause and effect of grammatical change. *Bilingualism: Language and Cognition*, 14(2), 121-145.

Perpiñan, S. (2016). Catalan-Spanish bilingualism continuum: The expression of non-personal Catalan clitics in the adult grammar of early bilinguals. *Linguistic Approaches to Bilingualism*. Published online 1 February.

Slabakova, R., Kempchinsky, P., & Rothman, J. (2012). Clitic-doubled Left Dislocation and Focus Fronting in L2 Spanish: A case of successful acquisition at the syntax-discourse interface. *Second Language Research*, 28(3), 319-343.

Unsworth, S. (2016). Early child L2 acquisition: Age or input effects? Neither, or both? *Journal of Child Language*, 43, 603-634.

Valenzuela, E. (2006). L2 end-state grammars and incomplete acquisition of Spanish CLLD constructions. In R. Slabakova, S. Montrul & P. Prévost (Eds.) *Inquiries in Linguistic Development* (pp. 293-304). Amsterdam / Philadelphia: John Benjamins.

PRESENTATION 2:**Language acquisition and change: the acquisition of Catalan partitive and locative clitics**

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Even though there is much work on the acquisition of Catalan, the sociolinguistic context in which this acquisition takes place is tacitly assumed to be of no import in the development of grammar. Most of the experimental studies conducted on the acquisition of pronominal clitics (Gavarró et al. 2010, a.o.) have been carried out with children who are mainly exposed to Catalan. Perpiñan (2016) stressed that, depending on the sociolinguistic background, the acquisition of some grammatical structures may be attrited, and unveiled a contrast between grammaticality judgment and production of the clitics *en* and *hi*, partitive and locative clitic respectively, non-existent in most contemporary Romance varieties. As there is a study of the acquisition of *en* in Catalan, as well as French and Italian, 5-year-olds (Gavarró et al. 2011) there is a term of comparison for the results of production in Perpiñan (2016) and this should allow us to start evaluating the impact of varying degrees of exposure to Catalan. To account for the results, I hypothesise the emergence of null pronominals in early Catalan as a result of transfer from Spanish in children exposed to attrited Catalan and to Spanish in syntactic contexts in which a full pronominal is available in Catalan. On the methodological side, I argue that metalinguistic performance as in grammaticality judgement reflects on formal instruction, but production better reflects on internalised grammar, and the results of Perpiñan can be encompassed. I show that, in the case of clitic *en*, loss of the overt clitic cooccurs with loss of partitive prepositions (*una de blava* 'a blue one') and the loosening of restrictions on subject placement which disallow a subject intervening between verb and object; by hypothesis, this cluster of grammatical properties can be accounted for by the loss of an uninterpretable feature in *vP*.

References

- Gavarró, A., Guasti, M. T., Tuller, L., Prévost, P., Belletti, A., Cilibrasi, L., Delage, H., & Vernice, M. (2011). The acquisition of partitive clitics in Romance five-year-olds. *Iberia* 3(2): 1–19.
- Gavarró, A., Torrens, V., & Wexler, K. (2010). Object clitic omission: two language types. *Language Acquisition* 17(4): 192–219.
- Perpiñán, S. (2016). Catalan-Spanish bilingualism continuum: The expression of adverbial clitics in different types of early bilinguals. *Linguistic Approaches to Bilingualism*. doi 10.1075/lab.15004.per

PRESENTATION 3:**The acquisition of Spanish-Catalan pronominal clitics: the case of bi-trilingual children**

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Although the study of clitics in early acquisition has been examined greatly, paying attention to the omission of clitics, the differences between weak or strong pronouns, the clitic dislocation, based on generative approach (Wexler et al. 2004), there is little research focused on trilingual children (Khachatryan 2013; Devlin et al. 2012). The comparison of simultaneous bi-trilingual and monolingual children will allow us to evaluate the role of linguistic and non-linguistic factors (amount of input) for linguistic development, since trilingual children receive significantly less input in their languages.

We present results from a study with seven trilingual children longitudinally from the age of 1;6 until 2;8 years. The children were all born in Germany and Spanish or Catalan was one of their three languages. The longitudinal children were exposed to two languages at home and to the third language in kindergarten (Arnaus Gil & Müller 2015). The children were compared on the basis of age, MLU and language combination. The paper will examine the omission or not of the clitics in comparison of their correspondent DPs and the differences between the weak and strong pronouns.

Since both languages, Catalan and Spanish, are pronominal languages, we want to examine whether the differences regarding to the clitics and full pronouns are relevant to the acquisition of pronominal system, as Escobar & Gavarró analysed (1999).

The previous results indicate that children carry out the greatest percent of omission in Catalan at age of 2;0, while children in Spanish present more target like than omission at the same age. Concerning the DPs and strong pronouns, it does not matter in which language of them are used, but they appear later. Nevertheless, we are analysing more data to demonstrate that the clitics in early acquisition can occur different in the two romance languages, Catalan and Spanish.

References

- Arnaus Gil, L. & Müller, N. (2015). The acquisition of Spanish in a bilingual and in a trilingual setting: Combining Spanish with German, French and Catalan. In: T. Judy & S. Perpiñán (Eds.) *The Acquisition*

of Spanish in Understudied Language Pairings. Amsterdam: Benjamins, 135-168.

Devlin, M., Folli, R., Henry, A., & Sevdali, C. (2012). Clitic Left Dislocation in Absence of Clitics: a Study in Trilingual Acquisition. University of Pennsylvania Working Papers in Linguistics, 18(1), 6.

Escobar, L., & Gavarró, A. (1999). The acquisition of Catalan clitics and its implications for complex verb structure. Departament de Filologia Catalana i Departament de Filologia Espanyola, Universitat Autònoma de Barcelona.

Khachaturyan, E. (2013). Acquisition of Italian object clitics by a trilingual child. Christine Meklenborg Salvesen & Hans Petter Halland (Hgg.), Challenging Clitics. Amsterdam: Benjamins, 233-254.

Wexler, K., Gavarró, A., & Torrens, V. (2004). Feature checking and object clitic omission in child Catalan and Spanish. Amsterdam Studies in the Theory and History of Linguistic Science Seires 4, 256, 253-268.

PRESENTATION 4:

Semantic redistribution of copula *ser/estar* in simultaneous Catalan/Spanish bilingual children and adults

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The present study examines the distribution of copula *ser/estar* in Catalan and Spanish among simultaneous bilingual children and adults. In Spanish, *estar* is required in strict locative constructions, but in Catalan, both copula verbs can be used depending on the animacy features of the subject (Brucart, 2012). With stage-level predicates, Spanish uses *estar* almost categorically, while Catalan is more variable. In both languages, *estar* is restricted with locatives with event nominals. Previous research with adult bilinguals shows both overuse and underuse of *estar* in Catalan with locative and adjective constructions (Perpiñán, 2011; Sanz & González, 1995). Geeslin & Guijarro-Fuentes (2008) also found that Catalan and Valencian adult bilinguals significantly preferred *ser* with adjectives in Spanish. No previous work, however, has examined copula use among Catalan/Spanish bilingual children, and the extent to which bilingual children pattern with bilingual adults. Furthermore, we contribute to previous research by examining copula selection with event nominals, a less frequent context of use so far underexplored (Pérez-Leroux et al., 2010).

21 simultaneous bilingual children (age range, 6;7-11;0; $M=9;6$; $SD=2.04$), 19 adult bilinguals (age range, 18-27; $M=21;4$; $SD=2.7$), and 21 Spanish

monolingual children (age range, 7;5-10;9; $M=9;7$; $SD=0.58$) participated in the study. The bilingual children and adults were born and raised in Mallorca, Spain; the monolingual children were from Madrid. An Elicited Production Task tested *ser/estar* use in (a) locative constructions with animate (*Dora está en la playa* “Dora is at the beach”) and inanimate (*Las llaves están sobre el escritorio* “The keys are on top of the desk”) subjects; (b) locatives with event nominals (*El festival es en la Plaza Mayor* “The festival is at the Plaza Mayor”); and (c) with stage-level predicates (*La sopa está caliente* “The soup is hot”). We predicted bilingual children to behave differently from adults in Catalan evidenced in an overuse of *estar* with locatives and adjectives. However, we did not predict difficulties with event nominals, where both languages overlap in their strict use of *ser*, or with copula use in Spanish. Spanish was the dominant language of most of the children and the adults.

Results showed *estar* overuse among the bilingual children in Catalan locative contexts (animates, 89%; inanimate, 90%), and a restrictive use of *ser* (~0.2% for both animates and inanimate), as predicted. The adults showed a more optional pattern (animate, *estar*=56%; *ser*=30%; inanimate, *estar*=44%; *ser*=35%). With stage-level predicates, both bilingual groups preferred *estar* (children, 94%; adults, 79%). In contrast to our expectations, the children overextended *estar* with event nominals (*estar*=65%; *ser*=25%), while the adults preferred *ser* (*estar*=11%; *ser*=61%). In regard to Spanish, both bilingual groups preferred *estar* with locatives and adjectives, as expected, but the bilingual children again overextended *estar* with event nominals (*estar*=79%; *ser*=18%), in contrast with the adults who preferred *ser* (*estar*=0.7%; *ser*=68%). The Spanish monolingual children preferred *estar* with locatives and adjectives but also overextended *estar* with event nominals, although in a lesser extent than the bilingual children (*estar*=58%; *ser*=33%).

We suggest a developmental delay in the complete specification of the semantic features constraining copula selection in Catalan (namely animacy), leading to more restrictive use of *ser* in bilingual children with locative constructions. Furthermore, *estar* overextension with event nominals in Catalan children, and in Spanish among both bilingual and monolingual children might stem from input frequency effects, and a change in progress in monolingual Spanish. This change in progress becomes accelerated in a language contact scenario, leading to a more restrictive use of *ser*, and semantic reconfiguration/neutralization of the copulas, crucially with ‘movable’ events (Camacho, 2012; Batllori & Roca, 2011).

Elicited Production Task (25 items)

Locative context [+animate subject]



Context:

CAT: Na Dora ha sortit a passejar per Palma. En Bart vol jugar amb ella, però no sap on i et demana.

SPAN: Dora ha salido a dar un paseo por Palma. Bart quiere jugar con ella pero no sabe dónde y te pregunta.

"Dora has gone out for a walk around Palma. Bart wants to play with her but he does not know

where she is at and he asks you"

Prompt:

CAT: Digues-li al Bart on...

SPAN: Dile a Bart dónde..

"Tell Bart where..."

Expected response:

CAT: Dora es/està a la platja. (*estar✓/ser✓*)

SPAN: Dora está en la playa. (*estar✓/ser**)

"Dora is at the beach"



(2) Event Locative



Context:

CAT: Avui hi ha una gran festa per a Lisa. Dora vol anar a la festa però no sap on i et pregunta.

SPAN: Hoy hay una gran fiesta para Lisa. Dora

quiere ir a la fiesta pero no sabe dónde y te pregunta.

"Today there is a big party t

but she does not where and

Prompt:



Digues-li a Dora on....

Dile a Dora dónde....

"Tell Dora where..."

Casa de los Simpsons

Expected response:

CAT: La festa és a la casa dels Simpsons. (*estar*/ser✓*)

SPAN: La fiesta es en la casa de los Simpsons. (*estar*/ser✓*)

"The party is at the Simpsons"

References

Camacho, J. (2012): Ser and Estar: The Individual/ Stage-Level Distinction and Aspectual Predication. In José Ignacio Hualde and Antxón Olarrea (eds.), The Blackwell Handbook of Hispanic linguistics. Oxford: Wiley-Blackwell.

Batllo, M. & Roca, F. (2011). Grammaticalization of SER and ESTAR in Romance. In D. Jonas, J. Whitman & A. Garrett (Eds.). Grammatical Change: Origins, nature, outcomes. Oxford: Oxford University Press.

Brucart, J.M. (2012). Copular alternation in Spanish and Catalan attributive sentences. Revista de Estudos Linguísticos da Universidade do Porto, 7, 9-43.

Geeslin, K. & Guijarro-Fuentes, P. (2008). Variation in Contemporary Spanish: Linguistic Predictors of Estar in four cases of language contact. Bilingualism: Language and Cognition, 11, 3, 356-380.

Pérez-Leroux, A.T., Álvarez, Y. & Battersby, T. (2010). Cuando era feliz, e indocumentado: An Aspectual Approach to Copula Choice in L2 Spanish. In Claudia Borgonovo et al. Selected Proceedings of the 12th Hispanic Linguistics Symposium (pp.209-220). Somerville, MA: Cascadilla Proceedings Project.

Perpiñán, S. (2015). The locative paradigm in the L2 Spanish of Catalan Speakers. In Perpiñán, Silvia & Judy, Tiffany (Eds.), The Acquisition of Spanish in Understudied Language Pairings (pp. 105-132). John Benjamins.

Sanz, C., & González, M.J. (1995). Ser and estar in Tortosi Catalan: Language contact, language variation, and language change. Sintagma, 7, 5-25.

Sera, M.D. (1992). To be or not to be: use and acquisition of the Spanish copulas. Journal of Memory and Language, 31, 408-427.

SYMPOSIUM

The impact of congenital hearing loss on spoken language development

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Advances in neo-natal screening and early hearing aid/ cochlear implant technologies (HA/CI) have led to a gradual improvement of spoken language skills in children who are deaf and hard-of-hearing (D/HH). However, there remains a lot of variability in how well these children develop language, either because of individual children's inability to profit from the CI/HA technology, or because the children are less immersed in linguistic interactions than peers. Delays have been identified in several areas for example, Boons, et al (2013) found that deaf children with cochlear implants (CIs) showed poorer morphological and syntactic skills than their hearing peers. It is also less clear what changes are occurring for higher levels of language use e.g. pragmatic skills required in narratives. This symposium has two aims: 1) examine the development of a range of linguistic skills in children with varying levels of hearing loss; 2) begin to explore reasons why variability across D/HH children's language development continues to exist. Presentation 1 presents a new test to evaluate word- and sentence understanding in Dutch toddlers. Results showed that hearing loss significantly increases word and sentence identification errors, especially in noisy backgrounds. Presentation 2 explores narrative productions in American children with mild to severe hearing loss, finding decreased performance because of demands on grammar and working memory. Presentation 3 describes the development of verb morphology in the spontaneous speech of Dutch-speaking deaf children. Children with both CIs and HAs produced more subject-verb agreement errors than typically hearing peers. Finally, paper 4 describes deaf children's difficulties with English grammatical devices in narrative, as well as inferencing difficulties. The discussant will synthesize these four studies and go onto explore the influences of hearing age (time with CI/HA), parent interaction as well as general cognitive skills on deaf and hard-of-hearing children's spoken language development.

PRESENTATION 1:

Identifying auditory barriers to spoken language understanding in Dutch toddlers

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Reduced speech identification due to congenital deafness or severe hearing loss within the first years of life increases the risk for permanent language impairment (Coene & Govaerts, 2014). Therefore, it is important to get a proper evaluation of the speech understanding of pre-school children in relevant listening conditions. In adults, aspects of functional hearing are often measured through a 'listen-and-repeat'-task with materials that are presented against a noisy background (Smits, Goverts & Festen, 2013). Such test materials are not readily available for young Dutch-speaking children (Hammer, Coene & Govaerts, 2013).

We address this issue with a new speech perception screening instrument that is suitable for children from 2 to 6 years old. The test uses a 'picture-pointing' task with mono-syllabic CVC-words and short sentences. Stimuli and test-design are adapted to the language level of the target group. The test includes diagnostic features up to the level of phonology.

The aims are to determine (i) whether the test is able to discriminate between children with and without hearing loss with respect to their speech identification performance, (ii) the contribution of auditory and linguistic factors on speech identification at this young age, and (iii) the potentially beneficial effect of using carrier-sentences on word identification.

The results from a pilot study of 30 typically developing hearing children and 10 children with hearing loss between 4 and 6 years old show that age and hearing loss are significant predictors for successful word and sentence identification. Young children with hearing loss obtain the lowest number of correct repetitions. Furthermore, both study groups make significantly more word-initial consonant identification errors as compared to word-medial vowel errors.

Results are related to differences in sound energy between the two types of phonemes. Through data from an ongoing large-scale study of Dutch-speak-

ing toddlers, we will investigate whether the observed effects are robust across age and populations.

PRESENTATION 2:

Narrative Performance in School-Age Children who are Hard of Hearing

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In children with normal hearing (CNH), early narrative skills predict later academic success (Crais & Lorch, 1994). Children who are born profoundly deaf demonstrate delays in narrative skill development (Crosson & Geers, 2001). Children with mild-to-severe hearing loss are an underrepresented population in research: to date, there have been limited investigations of narrative productions in children with hearing loss in this range.

Research questions:

1. Is hearing status related to narrative production scores?
2. What factors influence spontaneous and retell narrative scores?

Participants included 54 CNH and 88 children who are hard of hearing (CHH; mean age = 7 years, range = 6.75 to 7.25). CHH had bilateral hearing loss ranging from 25 to 75 dB HL in the better ear. Participants generated spontaneous and retell narratives while viewing a wordless picture sequence. A narrative scoring scheme was adapted for scoring purposes.

CNH received significantly higher scores on the scoring rubric for both spontaneous and retell narratives compared to CHH. Aided audibility, syntax, and vocabulary size were significantly correlated with performance on the spontaneous narratives for CHH. Aided audibility, syntax, vocabulary size, and phonological working memory were significantly correlated with performance on the retell narratives for CHH.

The present study demonstrates an ecologically-valid approach for assessing language abilities in school-age children. Narrative elicitation tasks obligate use of advanced grammar and concepts and tap into working memory skills. On average, the CHH demonstrated delays in narrative skills relative to the CNH. Aided audibility is associated with individual differences in phonological working memory, vocabulary, and morphosyntax in CHH (Stiles et al., 2012), likely due to access to high-fre-

quency, low-intensity morphological markers. Better aided audibility appears to support higher-level skills such as narrative production as well. Narrative performance is a clinically- and theoretically-relevant area to examine in this population.

PRESENTATION 3:

Finite verb morphology in the spontaneous speech of Dutch-speaking children with cochlear implants and hearing aids

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Previous studies have shown that children with cochlear implants (CI) and hearing aids (HA) (moderate-severe hearing loss) are delayed in their development of morphosyntax (Geers et al., 2003; Moeller et al., 2010). However, these two groups of children are not often compared directly. Direct comparison will increase our insight into how hearing experience and audibility affects the acquisition of linguistic items of low perceptual salience (Leonard et al., 1992). Spontaneous speech samples were analyzed of 48 children with CIs and 29 children with HAs, aged 4 to 7 years. Standardized language analysis involved MLU, the number of finite verbs produced, and target-like subject-verb agreement. The outcomes were interpreted relative to expectations based on the performance of typically developing peers with normal hearing. Outcomes of all measures were correlated with hearing level in the group of HA users and age at implantation in the group of CI users.

For both groups, the number of finite verbs that were produced in 50-utterance sample was on par with MLU and at the lower bound of the normal distribution. No significant differences were found between children with CIs and HAs on any of the measures under investigation. Yet, both groups produced more subject-verb agreement errors than are to be expected for typically developing hearing peers. No significant correlation was found between the hearing level of the children and the relevant measures of verb morphology. Within the group of CI users, the outcomes were significantly correlated with age at implantation. Profoundly deaf children wearing CIs perform similarly to their peers with moderate-to-severe hearing loss wearing HAs on the production of finite verb morphology. Hearing loss negatively affects the acquisition of subject-verb agreement regardless of the hearing device (CI or HA) that the child is wearing.

PRESENTATION 4:

Narrative skills in deaf children who use spoken English: dissociations between macro and microstructural devices

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Due to advances in hearing aid technologies, cochlear implant technology and neo-natal screening, spoken language skills of deaf children are improving. Despite this, deaf children continue to demonstrate difficulties with higher level language skills (Guo, Spencer & Tomblin, 2013). Deaf children acquiring spoken English have difficulties in narrative development relative to their hearing peers both in terms of macro-structure and with micro-structural devices (Boons et al., 2013). Macro skills relate to experience with the world and general cognitive planning abilities. Micro skills are specific to the linguistic development of the child including grammatical morphemes and reference forms needed for sentential cohesion. A less well understood area for deaf children is their comprehension of a narrative's underlying message through inference making skills.

The current study compared narratives of 6 to 11-year-old deaf children who use spoken English (N = 59) matched to hearing peers for age and non-verbal intelligence. To examine the role of general language abilities, single word vocabulary was also assessed. Narratives were elicited by the retelling of a story presented non-verbally in video format.

Results showed that deaf and hearing children had equivalent macro-structure skills, but the deaf group showed poorer performance on micro-structural components. Furthermore, the deaf group gave less detailed responses to inferencing probe questions indicating poorer understanding of the story's underlying message. For deaf children, micro-level devices most strongly correlated with the vocabulary measure.

These findings suggest that deaf children, despite spoken language delays, are able to convey the main elements of content and structure in narrative but have greater difficulty in using grammatical devices more dependent on finer linguistic and pragmatic skills. These results will be discussed in comparison to similar profiles reported for hearing children with developmental language impairments.

References

- Boons, T., De Raeve, L., Langereis, M., Peeraer, L., Wouters, J., & Van Wieringen, A. (2013). Narrative spoken language skills in severely hearing impaired school-aged children with cochlear implants. *Research in Developmental Disabilities*, 34(11), 3833-3846.
- Coene, M., Govaerts, P.J. The development of oral language in children with bilateral hearing loss: From speech perception to morphosyntax. *Lingua* 139: 1-10 (2014).
- Crais, E. R., & Lorch, N. (1994). Oral narratives in school-age children. *Topics in Language Disorders*, 14(3), 13-28.
- Crosson, J., & Geers, A. (2001). Analysis of narrative ability in children with cochlear implants. *Ear and Hearing*, 22(5), 381-394.
- Geers, A. E., Nicholas, J. G., & Sedey, A. L. (2003). Language skills of children with early cochlear implantation. *Ear and Hearing*, 24 (suppl.), 46S - 58S.
- Guo, L. Y., Spencer, L. J., & Tomblin, J. B. (2013). Acquisition of tense marking in English-speaking children with cochlear implants: A longitudinal study. *Journal of Deaf Studies and Deaf Education*, 18(2), 187-205.
- Hammer, A., Coene, M., Govaerts, P. Zinnen of woorden? Een bespreking van het spraakmateriaal binnen de Nederlandse en Vlaamse spraakaudiometrie. *Stem-, taal-en spraakpathologie* 18,2: 1-13 (2013)
- Leonard, L.B., McGregor, K.K. & Allen, G.D., 1992. Grammatical morphology and speech perception in children with Specific Language Impairment. *Journal of Speech, Language and Hearing Research*, 35, 1076 - 1085.
- Moeller, M. P., McCleary, E., Putman, C., et al. (2010). Longitudinal development of phonology and morphology in children with late-identified mild-moderate sensorineural hearing loss. *Ear and Hearing*, 31, 625 - 635.
- Smits, C., Goverts, S.T. Festen, J.M. The digits-in-noise test: Assessing auditory speech recognition abilities in noise. *The Journal of the Acoustical Society of America* 133:1693-1706 (2013).
- Stiles, D. J., Bentler, R. A., & McGregor, K. K. (2012). The speech intelligibility index and the pure-tone average as predictors of lexical ability in children fit with hearing aids. *Journal of Speech, Language, and Hearing Research*, 55(3), 764-778.

SYMPOSIUM

Encoding events in language and cognition

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One of the fundamental abilities for humans is to create meaningful rePresentations of the world around them that is full of constantly unfolding dynamic events and communicating about these events with others. This ability emerges quite early in development such that young children often talk about the events around them (Pinker, 1989). However, understanding the development of this ability requires a multi-perspective approach as several key questions remain unresolved. What is the nature of infants' pre-linguistic event rePresentations? How do event rePresentations change as they make contact to language? Does cross-linguistic variation in the lexical-structural rePresentation of events affect non-linguistic event construals? And, how do theories of the way linguistic structure maps onto meaning inform our understanding of the nature of mental rePresentations of events?

This symposium brings together researchers working on different aspects of this question using a variety of methodologies across different age groups, ranging from infants and young children who are beginning to acquire language to more mature speakers. Presentation 1 probes the event components that guide infants' (and adults') event conceptualization, presenting evidence that infants attend to endstates and take culmination into account in their non-linguistic event rePresentations. Presentation 2 investigates whether English-learning toddlers' conceptualization of grounds change in ways similar to Japanese speakers depending on the English sentences they hear accompanying events. Presentation 3 examines relative prominence of event roles in linguistic and non-linguistic event construals, presenting cross-linguistic evidence for similarities in event rePresentations in language and cognition. Presentation 4 explores how different syntactic structures

are mapped onto semantic event roles and discusses the implications of such mappings for language acquisition.

Overall, the symposium aims to foster discussion on how these different approaches could be combined and fill the gaps in our knowledge of the link between event language and event cognition.

References

Pinker, S. (1989). *Learnability and cognition: The acquisition of argument structure*. Cambridge, MA: MIT Press.

PRESENTATION 1:

How we conceptualize the ends of events (and what it might mean for verb acquisition)

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To acquire verbs, must infants attend to the ends of the events they denote? In English, change-of-state verbs entail that the change of state is achieved, but in many languages event culmination is only implicated (e.g., Ikegami, 1981). Do infants conceptualize culmination as a critical event component, or do they initially "neglect" culmination until they learn how their language instantiates it (Wittek, 2002)?

We asked whether adults' and 14-month-olds' non-linguistic event conceptualizations reflect attention to culmination. They viewed pairs of events: one depicting a naturally expected result (e.g., dumping blocks out of a truck), the other a partially achieved version (e.g., lifting the truck bed so the blocks slide but do not fall out). Adults rated the similarity between the events; infants were habituated to one and tested for dishabituation to the other. If participants are sensitive to culmination, they should be more surprised if the events occur in the order complete-then-partial (because the latter fails to achieve the expected culmination) than in partial-then-complete order (viewing the partially completed event first should allow them to imagine what the fully completed version might look like).

As expected, adults (N = 23) rated events in the complete-then-partial order as less similar than both partial-then-complete order ($t(44) = 7.27, p < 0.001$). Six of nine infants (data collection in progress) mirror this pattern; though we do not yet have power to detect effects, infants looked longer at the second event in the complete-then-partial condition but did not dishabituate given partial-then-complete order.

For adults, and possibly infants, event culmination is a critical event component. If this pattern holds, it will indicate that infants do not initially neglect end-states (cf. Wittek, 2002), and that they are poised to acquire change-of-state verbs that entail the achievement of particular endstates.

References

Ikegami, Y. (1985). 'Activity'-'Accomplishment'-'Achievement' – A language that can't say 'I burned it but it did not burn' and one that can. In A. Makkai, A. K. Melby & R. Wells (Eds.), *Linguistics and philosophy essays in honor of Rulon S. Wells* (pp. 265-304). Amsterdam: John Benjamins.

Wittek, A. (2002). *Learning the meaning of change-of-state verbs: A case study of German child language*. Berlin; New York: Mouton de Gruyter.

PRESENTATION 2:

Finding common ground: The role of language

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Languages differ in how they encode events in verbs and prepositions. We ask how infants learn the particular way their language encodes event components. In Japanese, for example, different verbs are necessary to describe a person crossing a bounded ground (e.g., street) versus an unbounded ground (e.g., field), while in English, the same verb – crossing – describes both types of grounds. Both Japanese and English 13-to 15-month-old infants detect Japanese ground distinctions while at 18-to 20-months, Japanese-reared infants and only English-reared infants with low vocabulary maintain these distinctions (Göksun et al., 2011). While language is hypothesized to guide infants' progression from language-general to language-specific event perception, no prior studies have examined this hypothesis.

The present set of five between-subjects studies illuminates the role of language in the detection of event encoding. Thirteen-to 15-month-old English-learning infants (Experiment 1) detect Japanese ground-path distinctions in the presence of general language, replicating and extending Göksun et al., 2011. Using language (Experiment 2) accompanying both bounded and unbounded grounds with the same preposition, as in "She's walking keet the road, the field etc." 13-to 15-month-olds' detection of Japanese ground-path distinctions disappeared.

Twenty-one- to 24-month-old children (Experiment 3) no longer detect Japanese distinctions (replicating Göksun et al., 2011) until in Experiment 4 we offer novel prepositions paired uniquely with bounded and unbounded grounds, as "She's walking keet the road" vs. She's walking toke the field." Experiment 5 suggests that the phenomenon is unique to language; tones do not work. This is one of the first studies to show that language can be used to heighten and dampen children's sensitivity to "non-native" event components such as ground type (Casasola et al., 2009; Hespos & Spelke, 2004). Investigating the mechanism underlying semantic reorganization furthers our understanding of how children learn to talk about events in their native language.

References

Casasola, M., Bhagwat, J., & Burke, A. S. (2009). Learning to form a spatial category of tight-fit relations: how experience with a label can give a boost. *Developmental Psychology*, 45, 711.

Göksun, T., Hirsh-Pasek, K, Golinkoff, R. M., Imai, M., Konishi, H., & Okada, H. (2011). Who is crossing where?: Infants' discrimination of figures and grounds in events. *Cognition*, 121, 176-195

Hespos, S. J., & Spelke, E. S. (2004). Conceptual precursors to language. *Nature*, 430, 453-456.

PRESENTATION 3:

How children map event participants onto language

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Although it is widely assumed that the expression of events in language is based on the salience of event components at the perceptual/conceptual level (Jackendoff, 1990), little empirical work has tested this assumption directly. Furthermore, existing evidence on event role prominence comes from English (Lakusta & Landau, 2012; Wilson et al., 2014). Here, we ask whether the asymmetries in event role prominence generalize to other languages drawing on evidence from learners of two unrelated languages (English and Turkish).

Participants were 3-to-4-year-old English- and Turkish-learners (n=48). Stimuli were 24 pictures of caused-motion events in which a person/animal (Agent) used a tool/body part (Instrument) to move an object (Patient) to a destination (Goal). In English, Agents typically appear as Subject NPs, Patients as

Direct Object NPs, Goals as PPs and Instruments as PPs or Vs (e.g., raking).³ Turkish shows more surface variation due to pro-drop and case marking.

In Experiment 1 participants described the action depicted in the pictures. As expected, Agents appeared as Subject NPs in both languages, but were mentioned less in Turkish. Patients were always encoded as Direct Object NPs. As expected, descriptions diverged for the remaining components: Turkish speakers used case-marked NPs frequently for Goals and exclusively for Instruments. Despite this syntactic variation, the relative proportion of mention of each component was Patients=Goals>Instruments in both languages.

In Experiment 2, participants saw two versions of a picture flickering, and had to detect the changing object. Children in both age and language groups had equally low accuracy rates for Agent-changes. For the remaining (inanimate) components, the relative accuracy in detecting changes to each component was Patients=Goals>Instruments.

Summarizing, the relative salience of event components was similar across young learners of English and Turkish, despite the cross-linguistic differences in the syntactic positions in which entities were encoded. These findings offer cross-linguistic evidence for a homology between linguistic and conceptual event roles.

References

Jackendoff, R.S. (1990). *Semantic structures*. Cambridge, MA: MIT Press.

Lakusta, L. & Landau, L. (2012). Language and memory for motions: Origins of the asymmetry between goal and source paths. *Cognitive Science*, 36, 517-544.

Wilson, F., Ünal, E., Trueswell, J., & Papafragou, A. (2014). Paper presented at the 39th Annual Boston University Conference on Language Development, Boston, MA.

PRESENTATION 4:

Mapping from form to meaning: Light verb constructions and event construal

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When children learn to produce language, they learn to share mental models of their worlds with other people, shaping these worlds through their lexical choices, but also their choice of syntactic

structures. We can probe the mental models that comprehenders form, based on the syntactic structure they encounter, to derive mutually informative insights for language acquisition, linguistic theory, and event cognition. Here I present a case study in adult speakers, illustrating how linguistic structure shapes core aspects of mental models, such as the conceptualization of event participants.

For this case study, I will use the alternation between a transitive sentence (Mary kissed John) and a light verb construction (Mary gave John a kiss). This alternation is particularly interesting for the context of this symposium, since light verb constructions are very frequent in child-directed speech, as well as in adult language production. I will demonstrate how the alternation between a light verb construction and a transitive sentence influences the semantic roles associated with the described event; specifically, it is unclear whether a kiss carries a semantic role. Results from a categorization task and an eye-tracking study adapted from methods used in the infant cognition literature suggest that in light verb constructions, there is a tug-of-war between the argument structures of the light verb (give) and the light noun (kiss), which in turn is reflected in the nuances of mental event construals.

The results of these case studies shed light on the mapping from linguistic structure to event construals in adult comprehenders, raising questions on how this mapping might be formed during language acquisition, and the interaction of this mapping with linguistic frequency and the rePresentation of argument structure

PLENARY TALK

Sex and Stability in Early Child Language

Marc Bornstein

N.I.H., U.S.A.

Two enduring features of early child language are moderation by gender and stability of performance over time. In this talk I address both. First, many reports indicate that girls outperform boys in language, but on what measures, under what conditions, and for how long in development are still open questions. Second, I draw on several large scale, prospective, longitudinal studies to explore stability of individual differences in multiple age-appropriate multi-source measures of child language from infancy through adolescence. I also document the robustness of stability in language development across child language, gender, birth status, ethnicity, and socioeconomic class. These considerations of sex and stability lead to concrete recommendations concerning early intervention to improve lagging language in young children and consequences for child mental health.

SYMPOSIUM

Language development from the lens of crosslinguistic variation: A symposium in honor of Ayhan Aksu-Koç

CONVENER: Nihan Ketrez¹, Aylin Küntay, Şeyda Özçalışkan, Aslı Özyürek, Bilgi University¹, Koc University², Georgia State University³, & University of Radboud & MPI⁴

The symposium aims to celebrate the outstanding scholarly work of Dr. Ayhan Aksu-Koç and the publication of a Festschrift volume (Social environment and cognition in language development: studies in honor of Ayhan Aksu-Koç) to honor her pioneering work in child language acquisition. The symposium speakers, consisting of Ayhan's previous mentors, students, and close collaborators, will focus on different aspects of her work, and the impact of this work on the field. More specifically, the papers will address Ayhan's unique contributions in the domains of crosslinguistic variation in language acquisition, particularly with respect to our understanding of the acquisition process in non-Indo-European languages, such as Turkish and Hebrew (Slobin, Berman), evidentiality and theory of mind (Lieven, Aydın), and narrative development (Nicolopoulou). The symposium will not only serve as an acknowledgment of the scholarly contributions of Aksu-Koç to the field, but will also provide a timely reminder of the renewed interest in multi-dimensional approaches to language development, particularly within a crosslinguistic framework.

PRESENTATION 1:

A Turkish window onto child language acquisition

Dan Slobin, University of California, Berkeley, U.S.A.

Each language provides a window through which we can get a view of the child's path toward language mastery—the obstacles along the way, the achievements. The history of our field, until about a half-century ago, was grounded on views through

a small collection of windows, particularly English, German, French, and a few other European languages. Until then, it was expected that views from other windows would not be strikingly different from what had been seen through these windows. But now we have views from many different windows, casting doubt on "the universal child" who is acquiring variants of the same "universal grammar." It was the Turkish window that totally changed my understanding of the problem. The structure of the language was not like any of the others that I knew, and so the child's path had to be different as well. I first looked through that window early in my career, in 1969, and to my great good fortune, Ayhan Aksu-Koç has shared my view since 1970, adding her skilled Turkish-trained eyes. In the course of these 47 years or so she and I and our students (for she has generations of students to her credit) have gained new insights into the acquisition of many systems of language and discourse: morphological inflections; domains of tense, aspect, and modality; the roles of word order and complex syntax in presenting points of view in narrative and interactional discourse; and more. In a tribute to her never-ending and important contributions, I will sketch out ways in which looking through a Turkish window have changed and enriched our understanding of human development.

PRESENTATION 2:

Language acquisition within a cross-linguistic perspective

Ruth A. Berman, Israel Academy of Science and Humanities, Israel

Among the many threads connecting our work over the past several decades, Ayhan's pioneering research and insights on acquisition of Turkish as a first language—formerly little understood and studied at a time when the field was largely anglo-centric—was an inspiration to my own work on Hebrew, as another non-European language spoken in the Middle East. I have had the privilege of working together, on cross-linguistic projects since the early 1980s, sharing an office in the Max-Planck Institute in Nijmegen, at Berkeley with our shared mentor and friend Dan Slobin, at Linguistic Institutes in New Mexico, and at IASCL meetings all over the world. One of her many contributions to our understanding of child language in general and in Turkish particularly is the domain of temporality, where she brings to bear a deep understanding of tense- aspect-modality in an interweaving of form and function that formed a major motif in the frog story crosslinguistic investigations. She is a wonderful friend, an extraordinary human being, and a model of a researcher and scholar, who combines in depth understanding of language and

of psychology – making her a leader in the field of psycholinguistics across the world – a genuine care for social as well as academic issues in her work in education and underprivileged sections of the population, and an unusual integration into her home country of Turkey, in which she has played a unique position in training young scholars to follow in her footsteps, together with a broad and deep affinity for anglo-saxon and European culture.

PRESENTATION 3:

Evidentiality in Turkish

Çagla Aydın, Sabancı University, Turkey

Each language in the world has means to indicate various sources of knowledge. Turkish is one of those languages with grammatical elements that identify the source of the information being communicated. Ayhan Aksu-Koç's pioneering research and insights on the acquisition grammatical evidentiality has surely contributed to a great extent for its study to become a legitimate research area in itself. In the past 30 years, the field of psycholinguistics has witnessed the transformation of research in evidentiality from an area with a minority status (with approximately 15 linguistics journal articles between 1980-1995) to a mainstream psychological research area (half of the work on evidentiality appears in developmental and experimental psychology journals between 2000-2016; Web of Science frequency analyses). This visibility is largely due to the original contributions of Aksu-Koç and her colleagues- and her generosity in sharing her knowledge with younger generations of scientists as well as her modest openness in learning from them. Recognizing her contributions in other areas of research on acquisition of Turkish as a first language, I will outline how Aksu-Koç's former work on evidentiality influenced later work in the field, and end with how her mentorship has helped me shape my own research program by presenting some new data on the interface between evidentiality in local grammar and social-cognitive development.

PRESENTATION 4:

Successes and difficulties facing crosslinguistic language acquisition research

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Ayhan Aksu-Koç's work on children's acquisition of Turkish opened my eyes to the crucial importance of studying languages other than English as well as to

the beauties of the Turkish language. Together with Dan Slobin and others, this work put the empirical study of crosslinguistic issues in language acquisition on the map. In my talk, I will review how far we have come from this seminal early work and how much more there remains to be done. The fact that, for a child, communicative intent, syntax, semantics and pragmatics are all intertwined presents us with enormous theoretical and empirical challenges. These challenges can be met by a variety of methodologies none of which is perfect. I will take as my starting point for considering these issues, Ayhan Aksu-Koç's wonderful work on children's learning of Turkish evidentials on which she has published systematically over many years. I will briefly raise both the successes and difficulties encountered in cross-linguistic research over the last 40 years as well as the changes in methodology and cultural reach that have taken place over this time.

PRESENTATION 5:

Narrative development from a crosslinguistic perspective

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I met Ayhan as soon as I arrived at UC-Berkeley in 1976 to begin my graduate work in Psychology, where Ayhan was already an advanced graduate student. We became friends immediately and our friendship has continued and strengthened over the years. Even though Ayhan worked in psycholinguistics (with Dan Slobin) and I worked in cognitive development (with Jonas Langer) there have been important overlaps in our work over the years and I will highlight some of those. Her dissertation work in Turkish language acquisition focused on evidentials or what came to be known later on as source monitoring (whether the speaker knows the information first hand or from hearsay). In this respect, Ayhan was ahead of her time as the field of theory of mind was still in its infancy. The book based on her dissertation work has not only been read by people interested in the acquisition of a non-Indo-European language, but also by those interested in theory of mind; the book was also among the first to introduce a crosslinguistic perspective in this research area. Among her many contributions is her work on narrative development, which approaches children's narratives from macro- and micro-level perspectives and provides an important model to researchers and practitioners in the field. Last but not least, Ayhan's most important and lasting legacy comes from the many students and brilliant young scholars that she has trained and inspired over the years.

SYMPOSIUM

Constraints on the acquisition of sociolinguistic variation in monolingual and multilingual contexts

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Twenty years ago, in child phonology research, Menn and Matthei (1992) regretted that “competition between two ways to say a word [...] is a strange notion for a linguist’s lexicon; the field has not really even assimilated Labov’s variable rule [...].” However, a growing body of research has recently explored children’s acquisition of sociolinguistic patterns (Chevrot & Foulkes 2013; Lacoste & Green 2016). This symposium aims at sharing current sociolinguistic work on variation acquisition with psycholinguists by presenting five studies on language-internal variation between dialects as well as cross-language variation.

The concept of ‘constraint’, as referring to the notion of *orderly heterogeneity*, has been pivotal in sociolinguistics. The field has widely shown that language is variable and variation is constrained by social and linguistic factors in adult speech, e.g. gender, status, style and linguistic context. A basic question is to ask when and how children acquire these constraints.

Durham & Smith analyse the role of input regarding ten sociolinguistic variables used by 29 adults and their children (2;10-4;0) in a Scottish community. They show early correlations between input and output that stem from the interplay between CDS and sociolinguistic variation. Ghimenton shows that pragmatic constraints influence language choice (Italian vs. Venetan) in the speech addressed to two daughters (aged 5 and 8) in Veneto (Italy). Shin investigates subject-verb order in 24 monolingual children (aged 6-8) in Oaxaca (Mexico). Frequency and complexity explain why certain grammatical constraints are acquired earlier. Kushartanti studies the use of the Indonesian verb prefix *nge-*, which

marks voice and indexes informality, in 36 children (3 and 8) and teenagers. She discusses why linguistic constraints establish earlier than social ones. Khattab & Al-Tamimi investigate acquisition of gemination by 10 Lebanese Arabic-speaking children (1-3), living in London or Beirut. Geographical location constrains children’s variation of phonological contrast due to their respective language contact situation.

References

Chevrot, J.-P., & Foulkes, P. (2013). Language acquisition and sociolinguistic variation, special issue of *Linguistics* 51(2).

Lacoste, V., & Green, L. (2016). *Child Language Variation: Sociolinguistic and Formal Approaches*. *Linguistic Variation* 16(1). Amsterdam: John Benjamins.

Menn, L., & Matthei, E. (1992). The ‘two lexicon’ account of child phonology: Looking back, looking ahead. In C. A. Ferguson, L. Menn & C. Stoel-Gammon (Eds.), *Phonological Development: Models, Research, Implications* (pp. 211-247). Parkton, MD: York Press.

PRESENTATION 1:

Caregiver contrasts: How does input constrain output in the acquisition of sociolinguistic variation?

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Research on the acquisition of variation has shown that caregivers use lower rates of local forms than the adult community in child directed speech (CDS) (Foulkes et al. 2005; Smith et al. 2013). However, as with individuals within a community more generally (Guy 1980), CDS can exhibit wide inter-speaker variation: some caregivers use high rates of local variants, while others use more standard variants. How does this affect their children’s use of standard and local forms? While the influence of input differences on the acquisition of non-variable features is widely debated, our understanding of the effect of input on variable forms is even more limited.

In this paper, we contribute to this area of research through the analysis of data from 29 caregiver/child pairs (age 2;10-4;0) in a community in Scotland. Specifically, we assess the use of ten phonological, morphological and lexical variables, individually, but also, as a whole using a dialect density score which is tied to the degree to which speakers deviate from the means of the children or the caregivers. We then correlate this score across the in-

dividual caregiver/child pairs. Results confirm that there is wide variation across individual caregiver input, but the effects on output are mixed. There is a clear correlation in dialect density scores between caregivers and older children but not younger: these children use much lower rates of the local form compared to their caregivers. We suggest that these results arise from the interplay between variation and CDS: when compared to local variants, standard variants are privileged in the speech of the caregivers to the youngest children through classic characteristics of vowel lengthening and exaggerated pitch. As the child becomes more linguistically fluent, such traits disappear. We assess these results in the light of social evaluation of forms, the effects on CDS and the acquisition of variation more generally.

References

- Foulkes, P., Docherty, G. & Watt, D. (2005). Phonological variation in child-directed speech. *Language* 81(1), 77-206.
- Guy, G. R. (1980). Variation in the Group and the Individual: The Case of Final Stop Deletion. In W. Labov (Ed.) *Locating Language in Time and Space* (pp. 1-36). New York: Academic Press.
- Smith, J., Mercedes D., & Richards, H. (2013). The social and linguistic in the acquisition of sociolinguistic norms: caregivers, children, and variation. *Linguistics* 51(2), 285-324.

PRESENTATION 2:

Contact-induced constraints on the acquisition of phonological length contrast by Lebanese Arabic-speaking children.

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Children acquiring Lebanese Arabic are regularly exposed to French and English alongside Arabic from an early age (Zablitz & Trudeau 2008). Consonant length is contrastive in Arabic (e.g. /'bana/ *he built* vs /'ban:a/ *coffee producer*), but not in French or English. However, the French variety spoken in Lebanon is influenced by Arabic phonology, and medial French consonants in disyllables with iambic stress patterns are often phonetically lengthened, e.g. [ka's:e] *cassé*; [pa'p:a] *papa* (Khattab & Al-Tamimi 2013); a range of short to long realisations can be found, but to-date no systematic study has explored the linguistic or social constraints that govern these patterns of variation. This study aims to start filling these gaps.

We present data from a longitudinal study on the acquisition of gemination by 10 Lebanese children aged between 1 and 3, half of whom were living in London and the other half in Beirut. An acoustic analysis of disyllables with medial short and long targets reveals that at age 1, all children produce phonetically long Cs regardless of target or location, but differences start to emerge around age 2. Arabic Cs start to show a bimodal distribution in both groups, but geographical location predicts medial consonant duration for French words, with children growing up in London producing significantly shorter Cs in French words than in Beirut. We hypothesise that the London-based children's more frequent contact with native English influences their mixed Lebanese variety, showing the early seeds of contact-induced phonological change in the L1 of second-generation immigrants.

References

- Khattab, G., & Al-Tamimi, J. (2013). The role of geminates in shaping early word patterns by Lebanese-Arabic speaking children. In M.M. Vihman & T. Keren-Portnoy (Eds.) *Readings on Phonological Development: Templatic Approaches, Cross-Linguistic Data*. Cambridge: CUP.
- Zablitz C., & Trudeau N. (2008). Le vocabulaire chez les enfants libanais bilingues, libanais arabophones, francophones et bilingues. *Glossa* 103: 35-53.

PRESENTATION 3:

Acquiring constraints on variable morphosyntax: SV-VS word order in child Spanish

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By emphasizing linguistic variation and investigating patterns of language use, sociolinguistic research has revealed the probabilistic nature of grammar (Labov 1994). For example, adult Spanish speakers alternate between pre- and postverbal subjects, and this alternation is probabilistically constrained by factors such as subject, verb, and sentence type (Bentivoglio & Weber 1986). Currently, we still know very little about when and how children learn these probabilistic grammatical patterns. By examining children's linguistic variation, the sociolinguistic approach promises to increase our understanding of how these patterns develop. Thus far, sociolinguistic studies have found that some patterns emerge early, but others emerge late. For example, factors conditioning variable object clitic placement in Spanish are acquired by age three, whereas some constraints on Spanish subject pronoun expression emerge at around age eight (Miller & Hendriks 2014).

The current study examines Spanish subject-verb word order patterns in sociolinguistic interviews conducted with 24 monolingual children in Oaxaca, Mexico, ages 6;3-8;5 (total words produced by the children = 27,413). All lexical and pronominal subjects were extracted from the children's production data, yielding a total of 1,257 tokens. Of these, 16% occurred post-verbally, which is commensurate with rates found among adults (Bentivoglio & Weber 1986). Binary logistic regression was used to measure the relative impact of three predictor variables: subject, verb, and sentence type. Results demonstrated that, like adults, the children's subject placement was significantly conditioned by all three predictors: subjects were more likely to appear in post-verbal position if (i) they were lexical rather than pronominal, (ii) the verb was unaccusative or copulative rather than transitive or unergative, and (iii) the sentence was interrogative rather than declarative.

Why are some probabilistic grammatical patterns acquired earlier than others? The explanation offered here is that both frequency and complexity play a role. More frequent and simpler patterns, including probabilistic ones, should be easier for children to detect in the input.

References

Bentivoglio, P., & Weber, E. (1986). A functional approach to subject word order in spoken Spanish. In O. Jaeggli & C. Silva-Corvalán (Eds.) *Studies in Romance Linguistics* (pp. 23-40). Riverton, USA: Foris Publishers.

Labov, W. (1994). *Principles of Linguistic Change: Internal Factors*. Mass: Blackwell.

Miller, K., & Hendriks, A. E. (2014). What impact does ambiguous input have on bilingual language acquisition? *Linguistic Approaches to Bilingualism* 4(3), 363-368.

PRESENTATION 4:

Social and Linguistic Constraints on the Acquisition of Sociolinguistic Variation: The Use of Verbal Prefix *Nge-* in Jakarta

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This paper is aimed at investigating social and linguistic constraints on the acquisition of sociolinguistic variation with a focus on the use of Indonesian verbal prefix *nge-* marking active voice. The prefix is mainly used by the young adult generation in Jakarta in casual conversations and its sociolinguistic value indicates informality (Sneddon 2006). In a case study on the acquisition of Indonesian, it is

found that a child used it only with certain verb roots in informal situations (Dardjowidjojo 2000). Yet, the child's use of *nge-* conforms to the semantic and morphosyntactic cues constraining the prefix variation in adults (Slobin 1973). Thus an important issue is whether children have a full command of the variable constraints on *-nge* usage. Two studies are conducted to examine this issue by comparing four groups: 20 kindergarteners (mean age: 3;6), 16 primary school students (8;6), 16 secondary school students (13;6), and 12 high school students (18;6). The first study is based on picture-naming tasks eliciting verbs that attract *nge-*. The second one is based on spontaneous speech, obtained from four triadic conversations (two participants represent each age group while the other is the researcher). The instructions are in Colloquial Jakarta Indonesian.

Both studies generalize the result of the case study: the younger the group, the less frequent the use of *nge-*. Results thus suggest that the association of *nge-* with informal situations is still not fully acquired by the younger children. The amount of input may be the reason, as supported by observation during the data collection and by interviews with children's primary caregivers. However, the children have already mastered the grammatical constraint on the variation of the prefix. In conclusion, we will discuss the discrepancy between the acquisition of linguistic constraints and social constraints – i.e. style and age – during the acquisition of variation.

References

Dardjowidjojo, S. (2000). *Echa: Kisah Pemerolehan Bahasa Anak Indonesia*. Jakarta: Grasindo.

Slobin, D.I. (1973). Cognitive prerequisites for development of grammar. In C.A. Ferguson & D.I. Slobin (Eds.) *Studies of Child Language Development* (pp. 175-208). New York: Holt Rinehart & Winston.

Sneddon, J.N. (2006). *Colloquial Jakarta Indonesian*. Canberra: Pacific Linguistics.

PRESENTATION 5:

Variation in a language contact situation: Pragmatic constraints on children's use of multilingual resources in dyadic and multiparty interactions in Veneto (Italy)

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Investigating pragmatic development by examining the production and comprehension of speech acts

sheds light on the link between pragmatic functions and specific linguistic constructions (Bruner 1975; Ninio & Bruner 1978; Cameron-Faulkner & Hickey 2011), and gives an estimate of children's communicative development. Unlike grammatical acquisition, pragmatic development starts early with a wide range of communicative acts mastered by 2.5 years, yet fine-grained pragmatic competence is only fully mastered by the age of 10. So far, studies on pragmatic development have focused mainly on dyadic infant/child and caregiver interactions from either monolingual or bilingual families. Few have observed older children (>2 years), growing up in a diglossic language contact situation. These situations could shed light on the influence of the pragmatic constraints in non-addressed speech on children's production.

This paper aims to address these two points as it investigates two sisters' pragmatic development (respectively aged 5 and 9) in Veneto (northeastern Italy) where Italian (national language) and Venetan (regional language) are spoken along a continuum (Marcato 2002).

In a 10-hour corpus of naturally occurring dyadic and multiparty interactions, we coded speakers' language uses (Italian, Venetan or mixed) per speech act (N=3000), using the INCA-A coding (Ninio et al. 1994). Results show that both sisters receive little Venetan yet the eldest receives more Venetan than the youngest. In addition, Venetan and mixed utterances are produced mainly in directive speech acts although in multiparty interactions their function is to discuss joint focus of attention whereas in dyadic ones it is used to hold a conversation within fantasy play.

References

- Bruner, J. S. (1975). The ontogenesis of speech acts. *Journal of Child Language* 2, 1-19.
- Cameron-Faulkner, T., & Hickey, T. (2011). Form and function in Irish child-directed speech. *Cognitive Linguistics* 22(3), 569-594.
- Marcato, C. (2002). *Dialetto, dialetti e italiano*. Bologna: Il Mulino.
- Ninio, A., & Bruner, J. (1978). The achievement and antecedents of labelling. *Journal of child language* 5, 1-15.
- Ninio, A., Snow, C. E., Pan, B., & Rollins, P. (1994). Classifying communicative acts in children's interactions. *Journal of Communication Disorders* 27, 157-188.

DAY
3

WEDNESDAY, 19TH

10:30-12:30,

AMPHI LUCIE AUBRAC

SYMPOSIUM

Narrative abilities in bilingual children with typical and atypical development

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DISCUSSANT: Aquiles Iglesias

An efficient way to gain information about children's knowledge of vocabulary, grammar and story structure is through the use of narrative sampling. In order to produce narratives children must integrate their knowledge of vocabulary and grammar into a cohesive whole while they take the listeners' perspective into account. Narratives can be evaluated with respect to the story as a whole including episodic structure and story grammar components (macrostructure) (Stein & Albro, 1997). By early school-age, children typically produce stories that include macrostructure elements of: characters, setting, initiating event, plans, attempts or actions, consequence and an internal response. Narratives are also evaluated in terms of the specific linguistic devices (words and sentences) that are used to establish referential and relational coherence (microstructure) (Justice, et al., 2006). As children mature, they refine use of linguistic elements related to literate, decontextualized language.

We can elicit stories in the first and/or second language to better understand developmental outcomes in each language and cross-language influences on language production. The use of narratives may further allow us to identify patterns that are associated with typical bilingual acquisition vs. those associated with language impairment. In this symposium we present data from three countries representing 8 language pairs. The four studies each examine performance differences in children with and without language impairment on narrative tasks focusing on macrostructure and microstructure elements. These are examined using various approaches and scoring systems across studies demonstrating different applications of narrative analysis. Factors that affect narrative performance including age of second language acquisition, exposure to the first and second language, as well as language ability are explored. We demonstrate that L1 and L2 narrative production is related suggest-

ing conceptual transfer of story structure. Children with language impairment demonstrate different profiles of performance in both macro- and micro-structure in the L2 compared to typical bilinguals.

References

Justice, L. M., Bowles, R. P., Kaderavek, J. N., Ukrainetz, T. A., Eisenberg, S. L., & Gillam, R. B. (2006). The Index of Narrative Microstructure: A clinical tool for analyzing school-age children's narrative performances. *American Journal of Speech-Language Pathology*, 15(2), 177-191.

Stein, N. L., & Albro, E. R. (1997). Building complexity and coherence: Children's use of goal-structured knowledge in telling stories. In M. G. W. Bamberg (Ed.), *Narrative development: Six approaches* (pp. 5-44). Hillsdale, NJ: Lawrence Erlbaum

PRESENTATION 1:

Language experience and story grammar in bilingual children with and without PLI

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While story grammar has many universal elements, both language and story telling tasks may influence the production of bilingual children's narratives. In standardized narrative protocols, item difficulty associated with story grammar elements is similar across languages but children with LI may have special difficulties with different aspects of story grammar depending on the language. In this paper we explore the role of language experience in accounting for the relationship between language experience and story grammar. 168 children (21 of whom have language impairment) completed language tests, including a parental questionnaire focusing on language use, as part of a longitudinal study of bilingual language impairment and development. At kindergarten and first grade children produced story retells and tells based on a wordless picture books. Data was collected in English and Spanish. To assess children's production of story grammar elements all stories were transcribed and coded using the Narrative Story Score analysis from the Systematic Analysis of Language Transcripts. In the first analysis we explore the relationship between language experience and story grammar elements in typically developing children bilingual children. In the second analysis we explore the extent to which the same patterns hold for children

with TD and PLI. Overall there was a moderate relationship between experience and story grammar at kindergarten when children's shift to English by virtue of school entry is most notable. For English this relationship decreased in magnitude over time. For children with LI, correlations between experience and story grammar elements were small to moderate but for TD children matched for language experience correlations were moderate to large. Overall these findings highlight that in addition to differences in difficulty for certain aspects of stories, children with LI may have difficulty leveraging their language experience to produce complete and complex stories in both of their languages.

References

Miller, J., Andriacchi, K., DiVall-Rayn, J., Lien, P. (2003). Narrative Scoring Scheme.

Stein, N., & Glenn, C. (1979). An analysis of story comprehension in elementary school children. In R. Freedle (Ed.), *New directions in discourse processing* (pp. 53-120). Norwood, NJ: Ablex.

PRESENTATION 2:

Narrative Macro and Microstructure in School-Age Children: Differences in Performance in Spanish and English

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The current study explored the performance of school-age Spanish-English bilingual children on narrative discourse measures. Children completed the Oral Narration subtest of the Test of Narrative Language (TNL; Gillam & Pearson, 2004), which consisted of three story formats 1) a retell with no picture cues; 2) an independent story generated after a model using 5 sequenced pictures; and 3) an independent story generated after a model using a single picture. A parallel format was used to elicit stories in Spanish utilizing similar (but not translated) story themes for each condition. Macro and microstructure scores were derived from items across all three story formats. Participants included 163 2nd and 4th grade children with the following ability groups: children with language impairment (n=27), low normal performance (n=54), children with typical development (n=82). We explored differences in narrative macro and microstructure by language, impairment status, and grade, while controlling for language experience using percent

English exposure as a covariate. After controlling for exposure, there was a main effect for grade as well as a main effect of impairment status. Fourth graders outperformed second graders, and children without impairments outperformed those with impairment. There was a three-way interaction between language, discourse measures and the covariate. Even after controlling for exposure, children performed higher on macro-structure than microstructure and Spanish microstructure scores were higher than those in English. These findings are consistent with emerging studies that suggest that macrostructural knowledge are more closely interrelated across languages than microstructure (Lucero, 2015; 2016). Differences in microstructure performance across languages may be related to children's acquisition and mastery of using English-specific forms in structured discourse tasks.

References

Gillam, R. B., & Pearson, N. A. (2004). *Test of Narrative Language*. Austin, TX: Pro-ed.

Lucero, A. (2015). Cross-Linguistic Lexical, Grammatical, and Discourse Performance on Oral Narrative Retells Among Young Spanish Speakers. *Child Development*, 86(5), 1419-1433.

Lucero, A. (2016). Oral narrative retelling among emergent bilinguals in a dual language immersion program. *International Journal of Bilingual Education and Bilingualism*, 1-17.

PRESENTATION 3:

Narrative Abilities in English L2 learners with and without Specific Language Impairment

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This study investigated the narrative abilities of Canadian English second language (L2) learners with and without specific language impairment (SLI). First, we examined which narrative sub-skills best distinguished between L2 learners with typical development (TD) and with SLI to understand the utility of narrative tasks for clinical assessment with bilinguals (Iluz-Cohen & Walters, 2012, Tsimpli, Peristeri & Andreou, 2016). Second, we asked how individual difference factors such as, age of acquisition and quantity and quality of L2 input, influenced narrative performance and whether they did so differently for the TD L2 learners and those with SLI (Blom & Paradis, 2015). A standardized English narrative test was administered to 23 L2 children with SLI (mean age=69 months) and 83 L2 children with TD (mean age=70 months) from diverse first language backgrounds (Arabic, Chinese, Hindi/

Punjabi/Urdu, Spanish) who were matched for age, age-of-acquisition and length of exposure to the L2. A parent questionnaire/interview yielded data for the age and input factors. Narratives were coded for the following macro-and micro-structure sub-skills: story grammar, referring expressions in first mentions, syntactic complexity, mean length of utterance, lexical diversity and story length in words. Linear regression models were used to analyze the influence of group (L2-TD or L2-SLI) and the individual difference factors on children's performance for each narrative sub-skill. L2-SLI had significantly lower scores for all sub-skills except referring expressions and lexical diversity, with the strongest between-group differences for story grammar and syntactic complexity. Longer exposure to English in school and higher quality of the English input outside school predicted better narrative sub-skills for both groups. Parental use of English at home and age-of-acquisition did not predict narrative performance. We conclude that narratives show promise as assessment tools for bilingual children from diverse backgrounds and that similar input factors underlie L2 narrative development in children with TD and SLI.

References

Blom & Paradis, J. (2015). Sources of individual differences in the acquisition of tense inflection by English second language learners with and without specific language impairment. *Applied Psycholinguistics*, 36(4), 953-976.

Iluz-Cohen, P. and Walters, J. (2012). Telling stories in two languages: narratives of bilingual preschool children with typical and impaired language. *Bilingualism: Language and Cognition*, 15, 58-74.

Tsimpli I. M., Peristeri I, E., & Andreou M. (2016). Narrative production in monolingual and bilingual children with specific language impairment. *Applied Psycholinguistics*, 37(1), 195-216.

PRESENTATION 4:

“Bilinguals with ASD or with SLI: Can narratives describe their difference?”

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Although diagnostic criteria for Autism Spectrum Disorder (ASD) do not include language impairment, evidence exists on a subgroup of ASD children with concomitant language deficits that meet criteria for specific language impairment (SLI) (Tager-Flusberg, 2006). However, it is currently unknown which linguistic markers differentiate children with SLI from the language phenotype of ASD

children. Differentiating between children with ASD and SLI becomes more complex in contexts where more than one language is learned. The present study attempts to identify language markers unique to bilingual children with SLI and ASD through investigating their narrative production.

Participants included two groups of 60 8-year-old, Albanian-Greek bilingual children with High Functioning Autism (HFA) and SLI, 60 age-matched monolingual children with HFA and SLI, and an equal number of age-matched TD monolingual and Albanian-Greek bilingual children. Narratives were elicited in the children's L2, i.e. Greek, with the Edmonton Narrative Norms Instrument (Schneider et al., 2006), and were analyzed for both micro- and macrostructural properties. Microstructural measures included lexical diversity and syntactic complexity operationalized in terms of sentence forms (coordination-subordination) and types of subordination (complement, relative, adverbial clauses). Macrostructure, on the other hand, was measured in terms of episodic structure and use of internal state terms divided into two subcategories, namely, Theory of Mind (ToM)-related items expressing emotion and mental states, and non-ToM-related terms, including perceptual, physiological, and linguistic terms.

Results show that micro- and macrostructure are differentially affected in the two populations: bilingual children with SLI outperformed their bilingual peers with HFA on all macrostructural measures, while bilingual children with HFA had better performance than the SLI group in microstructure. We consider the role of language ability in Greek L2 so that we can isolate the differences in narrative performance between the two groups as an effect of their partly distinct language impairment.

References

Schneider, P., Hayward, D., & Dubé, R. V (2006). Storytelling from pictures using the Edmonton Narrative Norms Instrument. *Journal of Speech-Language Pathology and Audiology*, 30, 224-238.

Tager-Flusberg, H. (2006). Defining language phenotypes in autism. *Clinical Neuroscience Research*, 6, 219-224.

DAY
3

WEDNESDAY, 19TH

10:30-12:30,

AMPHI JEAN-BAPTISTE SAY

SYMPOSIUM

Individual differences in word learning: predictors and associates across the lifespan

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In this symposium we discuss new findings on early vocabulary, seeking in particular to find better predictors of vocabulary differences in young word learners.

Presentation 1 examines early ERP predictors of later vocabulary – following a large cohort of children from 9 months to 15 months and beyond. Children with a mature ERP pattern indicating better segmentation abilities were found at later ages to have larger vocabularies.

Presentation 2 moves beyond vocabulary sizes to look at vocabulary composition. Infants were found to benefit from domains of higher vocabulary density, as well as overall vocabulary size, in eliminating distractors in looking trials.

Presentation 3 seeks to examine methods of screening infants who may be at risk of early communication delay. We know that, in particular, premature infants, infants with a family history of speech and language delay and boys are more likely to have such communication delay. While vocabulary comprehension and production are often assessed in children under 18 months to screen for this risk, parent report of gesture may be more sensitive and accurate than of verbal abilities.

Presentation 4 presents comparative lifespan data, looking at learning of an artificial language by children and adults. Children are often assumed to be superior vocabulary learners but recent research has challenged this assumption, including these data.

Presentation 5 concludes the symposium by turning to computational modelling of children's vocabulary acquisition, comparing diversity versus quantity of input. In real world child-directed speech,

these two are highly associated, but in this model, diversity of input was more predictive of size of infant vocabulary than sheer quantity.

In conclusion, we will in our symposium widen the range of information we have about what predicts infant vocabulary abilities: size of vocabulary and of input matters, but also segmentation ability, composition of vocabulary, gesture, and diversity of input.

PRESENTATION 1:

Individual differences in segmentation longitudinally predict vocabulary growth

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To acquire vocabulary children must segment words from a continuous speech stream. Several studies using different methodologies (e.g., Headturn Preference, EEG) have linked individual differences in segmentation to later language development (e.g., Junge, Kooijman, Hagoort, & Cutler, 2012; Newman et al. 2006), although efforts to accurately model this relationship have been hampered by small sample sizes and dependent variables measured at single time points. We report on a large longitudinal study of infant segmentation using EEG, and analyse how individual differences in the ERP signal subsequently predict growth in vocabulary. Monolingual English-speaking 9-month-olds (N = 111) listened to sentences containing a medially placed target word (e.g., The eagle is in the tree) and then at test (300ms later) heard either target or control word in isolation. ERP recordings time-locked to the onset of the test word revealed three qualitatively different ERP response patterns in the left frontal brain regions: relative to the control word we observed (i) negativity ('negative responders'), (ii) positivity ('positive responders'), or (iii) no difference ('neutral responders'). Preliminary analyses reveal that these differences predict variance in subsequent vocabulary growth, as measured with MacArthur-Bates CDI (Fenson et al., 2007). Specifically, although the three groups did not differ in their vocabulary knowledge at 9 months, negative

responders had greater vocabulary growth from 9 – 15 months (measured every 3 months) than neutral or positive responders. The data corroborate previous ERP studies of infant segmentation, which have identified relative negativity as indicative of a mature segmentation response (e.g., Junge et al., 2012). They advance previous knowledge by unambiguously linking individual differences in the ERP signal to vocabulary growth across infancy. We continue to collect measures of language proficiency from the children as part of a larger longitudinal study and also discuss prediction of later language measures.

References

Fenson, L., Marchman, V. A., Thal, D. J., Dale, P. S., Reznick, J. S., & Bates, E. (2007). *MacArthur-Bates communicative development inventories (CDIs): Users' guide and technical manual* (2nd ed.). San Diego, CA: Singular Press.

Junge, C., Kooijman, V., Hagoort, P., & Cutler, A. (2012). Rapid recognition at 10 months as a predictor of language development. *Developmental Science*, 15, 463-473.

Newman, R., Bernstein Ratner, N., Jusczyk, A., Jusczyk, P., & Dow, K. (2006). Infants' early ability to segment the conversational speech signal predicts later language development: a retrospective analysis. *Developmental Psychology*, 42, 643-655.

PRESENTATION 2:

Semantic structure influences real-time word recognition in 18-month-olds

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Many early measures of vocabulary focus on the size of the lexicon, and this metric has revealed strong connections between early vocabulary and language processing abilities [1,2]. Recent discoveries suggest that early vocabulary growth is not random; children tend to learn words in semantically-structured patterns [3]. These findings suggest the structure of the early lexicon may illuminate developmental processes in lexical activation and processing. We investigate this idea in 18-month-olds by measuring inter-relations between vocabulary structure (semantic density), size (productive vocabulary) and real-time word recognition in semantically-related (SR) and semantically-unrelated (SU) picture contexts. For each child, we used parental vocabulary report to identify relatively Higher and Lower density semantic categories from several early-acquired semantic domains (e.g. ANIMALS, VEHICLES). Participants' recognition of words with

semantically related and unrelated competitors in these same semantic domains was measured using an eye-tracked looking-while-listening task. In SU trials, named target items were paired with a categorically-unrelated distractor image (DOG-CAR). Infants were faster to view the target object in High (vs. Low) density categories, suggesting that lexical processing was facilitated in Higher density domains. This relation was not influenced by overall vocabulary size. In SR trials, target items were paired with a categorically-related distractor image (DOG-BIRD). Infants with larger vocabularies showed greater interference for High (vs. Low) Density items, indicating that they experienced greater semantic interference from related distractor objects in denser semantic neighborhoods. Infants with smaller vocabularies experienced semantic interference from distractor objects in High and Low Density domains. The findings indicate that vocabulary size and semantic density jointly contribute to lexical processing in 18-month-olds. Importantly, our findings suggest that 18-month olds recognize similarities between early concepts, and that semantic structure may have differential influences on semantic interference and facilitation in lexical recognition as a function of vocabulary size.

References

Fernald, A., Perfors, A., & Marchman, V. A. (2006). Picking up speed in understanding: Speech processing efficiency and vocabulary growth across the 2nd year. *Developmental psychology*, 42(1), 98.

Fernald, A., & Marchman, V. A. (2012). Individual differences in lexical processing at 18 months predict vocabulary growth in typically developing and late talking toddlers. *Child development*, 83(1), 203-222.

Hills, T. T., Maaouene, M., Maaouene, J., Sheya, A., & Smith, L. (2009). Longitudinal analysis of early semantic networks preferential attachment or preferential acquisition? *Psychological Science*, 20(6), 729-739.

PRESENTATION 3:

Gesture screening in young infants: Highly sensitive to risk factors for communication delay

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Screening for early signs of communication delay usually includes spoken and receptive language. Gesture measurement can be an afterthought; the Communicative Development Inventory (CDI) Gesture scale in English1 has never been validated. Gestures are used frequently by infants and can be an important source of information.

We report data from the UK-CDI Words & Gestures (W&G) scale, investigating validity and sensitivity of the UK-CDI Gesture scale.

Parents of 1212 children aged 8-18 months completed the UK-CDI, and the Family Questionnaire assessing biological and social risk factors. Thirty families of 16-18 month olds also completed a gesture challenge task.

This first validation of the Gesture scale yielded significant correlation between gesture challenge and CDI Gesture scores. Both gesture and vocabulary had high internal consistency.

Gesture scores correlated significantly with more biological and social risk factors than verbal comprehension or production.

Gesture correlated with gender, birthweight, prematurity, firstborn status, and childcare hours. Comprehension correlated with firstborn status and childcare hours, and production with birthweight, prematurity, firstborn status and childcare hours.

Controlling for age, gesture alone was significantly poorer in boys, babies born before 33 weeks, and children with fewer hours in childcare.

Gesture and verbal production were together poorer in children with lower birthweights. Gesture, verbal comprehension and production were poorer in children with family history of language impairment.

Verbal comprehension alone was poorer in later-borns and children with some levels of parental education; verbal comprehension and production were poorer in children of mothers in some age groups.

The findings for maternal age and parental education indicate that gesture scores may be influenced less by social desirability. In some groups families may over-report vocabulary but assess gesture more realistically.

We conclude that gesture is sensitive to risk of future communication difficulties, and our parental report gesture scale is valid and internally consistent.

References

Fenson, L., Marchman, V. A., Thal, D., Dale, P. S., Reznick, J. S., & Bates, E. (2007). *MacArthur-Bates Communicative Development Inventories (CDIs)*, Second Edition (Vol. 59). Baltimore, MD: Brookes.

PRESENTATION 4:

Child-adult differences in artificial language learning: Evidence from the cross-situational learning paradigm

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We introduce a novel artificial language paradigm that is part of a long-term project on individual differences in language learning across the lifespan. The paradigm allows us to investigate the simultaneous learning of words from different grammatical categories, as well as the syntax in which they occur. Furthermore, the paradigm enables us to monitor learning as it progresses throughout the exposure phase. The artificial language lexicon consists of a set of pseudowords (drawn from noun, verb, adjective, and subject/object marker categories) while the grammar of the artificial language is based on Japanese syntax. Native speakers of English are trained on the artificial language by means of an innovative cross-situational learning task. We present data from two experiments that demonstrate that children (8-10) and adult learners can simultaneously acquire lexical and syntactic information by keeping track of cross-trial statistics, after brief exposure, without feedback and without the conscious intention to learn. However, the data also demonstrate that there are important differences in what is learned. Whereas both children and adults learn the syntax of the language effectively, the adults learn the vocabulary more quickly, and show an advantage for verbs over nouns, which is not observed so clearly in the children's learning. We conclude by discussing implications for future research on first and second language learning.

PRESENTATION 5:

Quality not quantity in caregiver speech: Why lexical diversity provides a better learning environment than raw exposure to language

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Much of the variation in speed of vocabulary acquisition across children is explained by different experiences of the language environment. Children who are exposed to a lot of child-directed speech, with high levels of lexical diversity, learn language quicker and have larger vocabularies than children who do not. This holds across the preschool years (Marchman & Fernald, 2008).

However, very little work directly compares the independent effects of exposure and diversity on child language. The two are highly correlated in naturalistic speech; adults who produce a lot of speech tend also to produce a greater variety of words. This is problematic, since any complete theoretical account of vocabulary acquisition has to explain how different properties of the input are utilized during learning, and how changes in the amount and structure of this learned knowledge over development affects subsequent learning.

To overcome this problem, we investigated how exposure and diversity impact learning throughout development using a computational model that learns lexical phonological knowledge from exposure to phonemically-coded input (CLASSIC; Jones, 2016; Jones, Gobet, Freudenthal, Watson, & Pine, 2014). In study 1, we measured the model's learning after exposure to different inputs (e.g. more/fewer tokens, more/fewer types) and showed that, while exposure to language may be important early in learning, hearing a diverse vocabulary is ultimately more crucial. In study 2, we tested the model against data from 16 English-learning 2-year-olds, and confirmed that vocabulary size was more strongly predicted by input diversity than exposure. In studies 3 and 4, we showed that a model trained on a diverse input also performed better on nonword repetition and sentence recall tests, and was quicker to learn new words over time. We conclude that a language input that is rich in diversity promotes faster vocabulary acquisition than an input with equivalent richness in exposure.

References

Jones, G. (2016). The influence of children's exposure to language from two to six years: The

case of nonword repetition. *Cognition*, 153, 79–88. <http://doi.org/http://dx.doi.org/10.1016/j.cognition.2016.04.017>

Jones, G., Gobet, F., Freudenthal, D., Watson, S. E., & Pine, J. M. (2014). Why computational models are better than verbal theories: The case of nonword repetition. *Developmental Science*, 17(2), 298–310. <http://doi.org/10.1111/desc.12111>

Marchman, V. A., & Fernald, A. (2008). Speed of word recognition and vocabulary knowledge in infancy predict cognitive and language outcomes in later childhood. *Developmental Science*, 11(3), F9–16. <http://doi.org/10.1111/j.1467-7687.2008.00671.x>

SYMPOSIUM

Beyond words and between the lines: Pragmatic skills acquisition and development in a lifespan perspective

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Pragmatic skills are cognitive abilities which play a crucial role in social interactions: they include what we say, why we say, and how we say it, and whether it is appropriate to the given situation. Very recent studies on irony and sarcasm (Matsui et al., 2016), metaphors (Seigneuric, Megherbi, Bueno, Lebahar, & Bianco, 2016) and idiomatic expressions (Oakhill, Cain, & Nesi, 2016) are a testimony to the continuing interest in non-literal uses of language, and its meaningful to researchers interesting in developmental language psychology. These works showed that pragmatic abilities acquisition developed during childhood and go on during adolescence and early adulthood. Furthermore, when these abilities are impaired, individuals have trouble grasping the communicative intention of the speaker because they fail to adequately use the different sources of information presented in the situation which help generate social inferences: extralinguistic (i.e., context) or paralinguistic cues (i.e., facial expression, prosody). In this symposium, we introduce four recent experimental researches to objectively understand the acquisition and development of pragmatic abilities. The first talk deals with the development of irony, analysing videotaped free discussions produced by young adolescents (Marc Aguert). The second deals with the assessment of idiom comprehension development in a lifespan perspective (Agnès Lacroix). The third and fourth talks report – in a complementary perspective – experimental research in atypical populations: in Asperger Syndrome children and adolescents (Jamila Hattouti), and in developmental dysphasia (Christelle Declercq). Finally, the fifth talk report research about the development of metaphor comprehension, using neuroimaging data (Natalie Kacinik). Cross-Presentation studies about both typical and atypical development, and neural correlates of non literal

language will pave the way for discussions about the complex development of such crucial skills.

Keywords: pragmatic skills acquisition, typical and atypical development, neural correlates of non literal language

References

Oakhill, J., Cain, K., & Nesi, B. (2016) Understanding of Idiomatic Expressions in Context in Skilled and Less Skilled Comprehenders: Online Processing and Interpretation. *Scientific Studies of Reading*, 20(2), 124-139.

Matsui, T., Nakamura, T., Utsumi, A., Sasaki, A. T., Koike, T., Yoshida, Y., Harada, T., Tanabe, H. C., & Sadato, N. (2016). The role of prosody and context in sarcasm comprehension: Behavioral and fMRI evidence. *Neuropsychologia*, 87, 74-84.

Seigneuric, A., Megherbi, H., Bueno, S., Lebahar, J., & Bianco, M. (2016). Children's comprehension skill and the understanding of nominal metaphors. *Journal of Experimental Child Psychology*, 150, 346-363.

PRESENTATION 1:

When do we begin to produce irony? A developmental study in adolescents

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Verbal irony is a frequent figure of speech that represents 8% of conversational turns in talk among friends according to Gibbs (2000). Children are far to produce as much irony as adults as shown by Pexman et al. (2009). Thus, even 10-year-old children produced very few ironic utterances compared with adults, less than 1% of the conversational turns. These studies point out that adolescence would be the period in which irony production widely expands. We investigated this issue with two complementary methods.

First, we videotaped free discussions produced by young adolescents (mean age: 12 years 7 months) and older adolescents (mean age: 16 years 2 months). In all, we collected 2994 utterances. Analysis of this ecological corpus revealed that 2.55% of the 12-year-old adolescents' utterances were ironic while 5.42% of the 16-year-old adolescents' utterances were ironic. This increase, the production doubled between 12 and 16 years, was significant.

Second, we asked participants to perform a short sketch with an experimenter. The context provided to the participant (a very bad day) was designed to

elicit irony on the last sentence of the sketch (“it was really great”). Eighty 12-year-old adolescents participated together with 100 young adults (mean age: 20 years 3 months). Results showed that 64% of the young adults produced irony on the last sentence while only 30% of the adolescents did it. Once again the production was doubled from 12- to 20-year-old and the increase was significant.

Our data clearly establish that adolescence is the period where the production of irony mainly expands. Contrary to a common idea, language is still developing in adolescence, particularly at the pragmatic level. We will attempt to speculate about the determinants of these developments, in the light of late changes recently highlighted in the domain of social cognition (Blakemore, 2008).

References

- Blakemore, S-J. (2008). The social brain in adolescence. *Nature Reviews Neuroscience* 9(4), 267-277.
- Gibbs, R. (2000). Irony in talk among friends. *Metaphor and Symbol*, 15, 5-27.
- Pexman, P. M., Zdravilova, L., McConnachie, D., Deater-Deckard, K., & Petrill, S. A. (2009). That was smooth, Mom: Children’s production of verbal and gestural irony. *Metaphor & Symbol*, 24, 237-248.

PRESENTATION 2:

Understanding the idiomatic expressions in a life-span perspective

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The aim of our study is to determine the cognitive processes involved in the understanding of the idiomatic expressions in a life-span perspective. The idiomatic expressions are a form of non literal language in which there is a considerable difference between what is said (literal interpretation) and what is meant (idiomatic interpretation). The comprehension of these expressions is very context-dependent in which they are produced. So, in our study, we considered the role of the context and the features of these expressions (degree of familiarity and degree of transparency). Five groups of subjects (two groups of children aged between 6 years and 6 months to 10 years and 6 months, a group of adolescents aged between 11 years and 17 years, a group of adults aged between 18 and 30 years and a group of elderly persons aged from 60 years and more) participated to the study. We asked them to realize a task of completion of stories (task of understanding of idioms) where every answer must be justified (evaluation of the metapragmatic abilities). This evaluation was completed by tests

evaluating the working memory capacities (tasks of verbal span, visuospatial and multimodal) and the executive functions (test of Stroop, Wisconsin Card Sorting Test or WCST and Trail Making Test or TMT). Results underline a context effect and a familiarity effect for the children and the adolescents. Nevertheless, no significant effect of transparency appears. The old subjects, as for them, gave fewer idiomatic answers, in idiomatic context and for the familiar and transparent idioms. Besides, we observe that at the various ages of the life, there are links between the understanding of the idiomatic expressions and the executive functions. However, the executive processes involved are not the same during the development.

PRESENTATION 3:

“To cut the mustard”: Pragmatic abilities underlying idiom comprehension in Asperger Syndrome or High-Functioning Autism

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Pragmatic abilities are key to adapt language interactions. It has been proposed that people with an autism spectrum disorder (ASD) have difficulty with pragmatic skills. It attributed to poor ability to draw inferences during communication and to inadequate access to relevant knowledge (Loukusa & Moilanen, 2009). Our study tested this hypothesis by measuring inferences underlying idiom comprehension. The use of idioms is an interesting linguistic phenomenon because it provides the ideal material for operationalizing the difference between “what is said” and “what is meant” according to context. Used idioms were translated of European idioms for which no French equivalents were known (Cain, Oakhill, & Lemmon, 2005), that allows us to assess idiom processing without the confound of prior knowledge (i.e. memory). Our purpose was to investigate ability to use two inference types – semantic analysis and inference from context – in both typical and atypical (i.e. ASD) adolescents. To this aim, we used an original computerized assessment system simulating an ecological communication situation through movies placing the participant at the center of interaction. Idioms were transparent or opaque, and they were presented in a supportive narrative context (i.e., which induced an idiomatic interpretation of the expression) or in a non-informative one (i.e., which idioms are presented without supportive story). 46 normally developing controls and 23 ASD were matched on chronological age, mental age and verbal comprehension. Re-

sults showed that ASD were able to use semantic analysis and to do inference from context to support their idiom comprehension. However, only typical adolescents showed a general facilitator effect of context, including for transparent idioms. This lack of contextual inference's impact in ASD people is discussed according to levels of cognitive switching and in the light of weak central coherence theory (Happé & Frith, 2006).

References

Cain, K., Oakhill, J., & Lemmon, K. (2005). The relation between children's reading comprehension level and their comprehension of idioms. *Journal of Experimental Child Psychology*, 90, 65-87.

Happé, F., & Frith, U. (2006). The Weak Coherence Account: Detail-focused Cognitive Style in Autism Spectrum Disorders. *Journal of Autism and Developmental Disorders*, 36(1), 5-25.

Loukusa, S., & Moilanen, I. (2009). Pragmatic inference abilities in individuals with Asperger syndrome or high functioning autism. A review, *Research in Autism Spectrum Disorders*, 3, 890-904.

PRESENTATION 4:

Figurative language comprehension in children with specific language impairment in relation with conversational perspective-taking and theory of mind abilities

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While an impressive body of research concerns phonological and morphosyntactical abilities of children with SLI (specific language impairment), little is known about their semantic and pragmatic abilities. Our aim was to study how children with SLI understand figurative language (metaphors and idioms) and to determine whether conversational perspective-taking and theory of mind (TOM) abilities play a role on that understanding. Theory of mind traditionally refers to the ability to understand mental states of others. Norbury (2005) showed that children with SLI were impaired in metaphor comprehension in comparison with typically developing children, and that only semantic knowledge,

but not TOM skills, predict metaphor comprehension in both typically developing and SLI children. Furthermore, other studies demonstrated that conversational perspective-taking and theory of mind abilities predicted the comprehension of some idioms by typically developing children (Caillies & Le Sourn-Bissaoui, 2013; Le Sourn-Bissaoui, Caillies, Bernard, Deleau, & Brulé, 2012). These results emphasize that further work is needed on figurative language comprehension in children with SLI. In our study, 21 SLI children aged 6-11 years were asked to listen to metaphors, non decomposable idioms and literal statements inserted in context and to perform a multiple choice task. They also were asked to perform three tasks assessing conversational perspective-taking (language acts, shared/unshared information and conversational maxims) and five theory-of-mind tasks (an appearance-reality task, three false-belief tasks and a second-order false-belief task). Their performances were compared to those of typically developing age-matched children. Results indicated that children with SLI were impaired both in figurative and literal language comprehension. These children also appeared impaired in perspective-taking and TOM abilities, and these difficulties predicted differently metaphors and idioms comprehension. These data indicate that figurative language understanding is not specifically impaired in SLI but confirm the role played by general pragmatic abilities in the development of figurative language comprehension.

References

Caillies, S., & Le Sourn-Bissaoui, S. (2013). Non-decomposable idiom understanding in children: recursive theory of mind and working memory. *Canadian Journal of Experimental Psychology*, 67(2), 108-116.

Le Sourn-Bissaoui, S., Caillies, S., Bernard, S., Deleau, M., & Brulé, L. (2012). Children's understanding of ambiguous idioms and conversational perspective-taking. *Journal of Experimental Child Psychology*, 112, 437-451.

Norbury, C.F. (2005). The relationship between Theory of Mind and metaphor: Evidence from children with language impairment and autistic spectrum disorder. *British Journal of Developmental Psychology*, 23, 383-399.

PRESENTATION 5:

The Neural Basis of Metaphor Comprehension: Examining the Contributions of the Left and Right Cerebral Hemispheres

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Early research on the neural basis of metaphor processing, particularly studies of brain-injured patients, suggested that the right hemisphere (RH) was mainly responsible for comprehending metaphors (e.g., Winner & Gardner, 1977; Bottini et al., 1994). However, most recent divided visual field (DVF), fMRI, and ERP studies of normal individuals have generally not supported the RH metaphor hypothesis and indicate that left hemisphere (LH) regions may be just as, if not more important, for understanding figurative language (e.g., meta-analysis by Rapp et al., 2012). I will present research with young adult participants designed to investigate the extent to which each hemisphere is involved in comprehending metaphors of increasing linguistic complexity, ranging from lexical metaphors (individual words with a literal and figurative sense) to typical nominal metaphors like "My best friend's life is a soap opera". Using DVF, ERP, and TMS techniques, along with a variety of tasks including lexical decision, word generation, and relatedness judgments, the experiments showed that the LH can generally process metaphors just as quickly and accurately as the RH. However, there was some evidence of greater RH involvement when the metaphoric stimuli were more complex, when right posterior temporal processing was disrupted, and when participants had to explicitly judge if a word was related to the meaning of the preceding sentence. Hence, the results do not generally support the RH as the preferred neural substrate for understanding metaphors, since both hemispheres were mainly similar in their ability to process and activate metaphoric meaning, although there are certain conditions where RH processes do become relatively more important. The current findings are thus potentially useful for explaining the discrepancy between studies of brain-injured participants that tend to support the RH metaphor hypothesis versus those with normal non-injured individuals that mostly do not.

References

Bottini, G., Corcoran, R., Sterzi, R., Paulesu, E., Schenone, P., Scarpa, P., & et al. (1994). The role of the right hemisphere in the interpretation of figurative aspects of language: A positron emission tomography activation study. *Brain: A Journal of Neurology*, 117, 1241-1253.

Rapp, A. M., Mutschler, D. E., & Erb, M. (2012). Where in the brain is nonliteral language? A coordinate-based meta-analysis of functional magnetic resonance imaging studies. *Neuroimage*, 63(1), 600-610.

Winner, E., & Gardner, H. (1977). The comprehension of metaphor in brain-damaged patients. *Brain*, 100, 717-723.

SYMPOSIUM

Acquisition of Complex Predicates in Sahulian Indigenous Languages

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While the production of complex predicates (Alsina et al. 1997) represents an important milestone in L1 acquisition (Snyder 2001), their acquisition has yet to be investigated in a range of typologically diverse languages. For instance, languages of the Sahul region (Australia and New Guinea) are known for complex predicates, including serial verbs, light verbs, and classifier verbs. The island of New Guinea alone is home to over 10% of the world's living languages, and most of these include serial verbs, light verbs, or other complex predicates, but a lack of data has meant that Sahulian languages are not referenced in extant literature on acquisition of complex predicates. This symposium presents results on aspects of complex predicate acquisition from five new longitudinal studies of children learning indigenous Australian and Papuan languages.

Two of the papers focus on complex predicates in child-directed speech (CDS). The widely-reported assumption that CDS is syntactically simplified (e.g. Snow 1976) is examined critically with respect to data from Murrinhpatha (Australia) and Nungon (Papua New Guinea). Neither Murrinhpatha nor Nungon CDS involves simplification of complex predicates. In fact, Nungon CDS actually expands simplex verbs into complex predicates. Both papers demonstrate that simplification of CDS must be construed in terms of distributional patterns rather than at the level of the individual utterance. The third paper compares incidences of two complex predicate types, adjunct-verb and serial verb constructions, in child speech, CDS, and adult speech in Ku Waru (Papua New Guinea). The disproportionate numbers of adjunct-verb constructions in early acquisition are argued to relate to structural congruence. The final two papers describe acquisition of prepositional verbs in Qaqet (Papua New Guinea) and serial verbs in Pitjantjatjara (Australia). The symposium aims to enhance discussion of the acquisition of complex predicates

with empirical evidence and analyses from indigenous languages of the Sahul region.

References

Alsina, A., Bresnan, J., & Sells, P. (eds.). (1997). *Complex Predicates*. Stanford: CSLI Publications.

Snow, C.E. (1977). Mother's speech research: from input to interaction. In C.E. Snow & C.A. Ferguson (eds.), *Talking to children* (pp. 31-49). Cambridge: Cambridge University Press.

Snyder, W. (2001). On the nature of syntactic variation: evidence from complex predicates and complex word-formation. *Language* 77, 324-342.

PRESENTATION 1:

Learning Murrinhpatha complex predicates: the role of input

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Murrinhpatha is an Australian polysynthetic language with complex predicates that pose particular challenges for the learner. Murrinhpatha complex predicates are built from two discontinuous stems, both morphologically bound in the verbal word. The classifier stem (in bold) provides generic verbal semantics and aktionsart and is selected from one of 40 paradigms, of which only 11 are ever heard alone. The lexical stem (underlined) provides much of the lexical semantics, and is also generally not encountered as a free form. These complex predicates form polysynthetic verbs, which also contain other affixes, confounding the acquisition task. An example is (1).

(1) ngurdan-wunku-rlarl-deyida-ngime=ngurran

1SGS.SHOVE.NFUT-3PCO-drop-in.turn-PC.
F=1SGS.GO(6).NFUT

'I am dropping them off, one after the other, as I go along.'

This paper addresses the following research questions:

- i) Do Murrinhpatha-speaking adults modify their verb input to young children?
- ii) What cues in the adult input might aid the development of complex predicate use?

Data come from a corpus of over 40 hours of adult-child interaction collected during the Language Ac-

quisition in Murrinhpatha project (2012-2016). We contrast adult-adult speech with adult-child speech coded according to the age of the child being addressed and the complexity of the verbal structure.

Results indicate that adults continue to produce morphologically complex verbs in child-directed speech, as seen in (2) when Beverly (aged 3;1) is prompted to repeat the full adult word:

- (2) 'Tham-ngarra-werr-ward- thama!
a=thim'
2SGS.BE.NFUT-1PL. 2SGS.DO.NFUT
EXLC.OBL-give_chance-
NOW=2SGS.SIT.NFUT

Say 'you're not giving us a chance'!

However, characteristics that are prevalent in child-directed speech may account for patterns found in the analysis of children's Murrinhpatha complex predicates, including the early acquisition of particular inflectional categories in the classifier paradigms, and the early identification of the lexical stem over the classifier stem. This study of input in a polysynthetic language contributes to our burgeoning understanding of how children acquire such complex systems.

PRESENTATION 2:

Syntactic complexity equals morphological simplification in Nungon child-directed speech

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An assumption of literature on child-directed speech (CDS) is that CDS is syntactically simplified relative to adult speech (Pfuderer 1969). Even when not simplified, CDS is expected to never exceed adult language in syntactic complexity. Simplification is presumed to operate at the level of individual utterances, measured by MLU or subordination, among other rubrics (Snow 1977). Data from a two-year longitudinal study of child acquisition of the Papuan language Nungon (1000 speakers in remote villages of Papua New Guinea) show that in one respect, Nungon CDS is more syntactically complex than adult Nungon. The increased syntactic complexity of Nungon CDS is argued to facilitate learning by reducing the number of allomorphs children need to recognize for verbal inflectional suffixes.

In Nungon CDS to children in the early stages of language acquisition, verbal predicates that would comprise a single inflected verb in adult speech

are optionally expanded into complex predicates. The expanded versions are auxiliary constructions with the verb to- 'do' as auxiliary and lexical verb in nominalized form. For instance, a mother at play with her daughter (2;4) produced (1):

- (1) ewek nauk na-ng ta-a-k.
snake water.BABYTALK consume-NMZ do-PRES-3SG

'The snake is drinking wa-wa.' [Literally: 'The snake is doing consuming water.']

In adult speech, (1) would lack the 'do' auxiliary, with *na-* 'consume' itself inflected, as in (2):

- (2) ewek yamuk na-ha-k.
snake water consume-PRES.SG-3SG

'The snake is drinking water.'

The CDS in (1) is both longer than the adult version in (2) and more syntactically complex. Nungon verbs belong to six morpho-phonological classes; across classes, inflectional suffixes take slightly different forms, seen in the different present tense suffix forms in (1) and (2). Expansion of simplex verbs into complex predicates adds syntactic complexity in individual utterances, but reduces morphological complexity when utterances are analyzed cumulatively.

References

- Pfuderer, C. (1969). Some suggestions for a syntactic characterization of baby talk style. Working paper n. 14. Berkeley: University of California.
Snow, C.E. (1977). Mother's speech research: from input to interaction. In C.E. Snow & C.A. Ferguson (eds.), *Talking to children* (pp. 31-49). Cambridge: Cambridge University Press.

PRESENTATION 3:

Structural congruence as a conditioning factor in Ku Waru child language acquisition

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In their study of the acquisition of German passive and future constructions, Abbot-Smith and Behrens (2006) showed how children's acquisition of a new construction may be either facilitated or inhibited by their prior acquisition of other constructions. In conclusion they argued for the need to consider 'in-

put frequency in terms of the frequency of certain aspects of the grammar in the grammar network as a whole, rather than merely of the particular item or construction under consideration' (1023-4). Drawing on that and other studies, Ambridge et al (2015) argue for the need to consider frequency effects at multiple levels of abstraction, and how they interact across those levels. In this Presentation we take up that argument and relate it to recent literature on language complexity — in particular to Culbertson and Kirkby's (2016) reworking of Joseph Greenberg's concept of 'harmony' among structural features of a given language. As evidence we draw on results from our longitudinal study of children's acquisition of Ku Waru, a Trans-New Guinea Papuan language spoken in the Western Highlands of Papua New Guinea. We focus on the acquisition of Ku Waru verb constructions which are widely found in Trans-New Guinea languages: serial verb constructions (SVC) and preverb+verb constructions (PVC). We show that children learn the PVC before the SVC, and argue that this is determined in part by the greater congruence between the PVC and other basic aspects of Ku Waru syntax. We develop implications of this case for the understanding of structural congruence as a dimension of linguistic complexity in general, and of the part it plays in child language acquisition.

References

Abbot-Smith, K., & Behrens, H. (2006). How known constructions influence the acquisition of other constructions: The German passive and future constructions. *Cognitive Science* 30, 995-1026.

Ambridge, B., Kidd, E., Rowland, C., & Theakston, A.L. (2015). The ubiquity of frequency effects in first language acquisition. *Journal of Child Language* 42, 239-273.

Culbertson, J. & Kirkby, S. (2016). Simplicity and specificity in language: Domain-general biases have domain-specific effects. *Frontiers in Psychology*, Jan 12, 2016. doi: 10.3389/fpsyg.2015.01964

PRESENTATION 4:

Acquisition of Qaqet complex verbs

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This paper looks at the acquisition of complex predicates in Qaqet, a non-Austronesian language of Papua New Guinea (ISO 639-3: byx; Baining family, East New Britain). The language is spoken by 10,000 speakers, and it is still being acquired monolingually in the remote Baining mountains. The paper is based on a longitudinal corpus of 5 children (aged 2;0-3;0, 2;0-3;4, 2;10-4;0, 3;2-4;6, 4;4-5;6) who were video-recorded for 1 hour per week in natural settings by their parents.

A large proportion of the Qaqet verb lexicon is compositional, consisting of verb roots plus other elements, often of prepositional origin. Relationships between base and complex forms can be established on formal and semantic grounds. Formally, they share numerous properties, including their (non-predictable) inflectional class. Semantically, we can identify semi-productive patterns. However, these patterns are complex and any given prepositional element never has only one function. Table 1 summarizes the distribution and functions of two such elements in the adult language.

Table 1. *mət* 'IN' and *pət* 'ON/UNDER'

Function	Base form		Complex form	
intransitivizing	*burj	break wise	sth. cross-	*burjmet get broken crosswise
transitivizing	sis	blow	sismet	blow at (+ physical contact)
	nəs	shout	nəspet	shout at (+ affectedness)
creating atelic expressions	tas	eat up	təsmet	eat from inside (e.g., coconut)
lexicalized	at	fall	təspet	eat from outside (e.g., mango)
	yuij	wave hand	atmet	meet
			yuijpet	shake

In our longitudinal corpus, the first complex forms start appearing around 2;8 (for putting and cutting events), but children continue to mainly use base forms in contexts where adults use complex forms. Around age 4;0 we see overextensions of prepositional elements. This study focuses on complex forms with *mət* 'IN' or *pət* 'ON/UNDER', reporting on the children's production and development of complex forms vis-à-vis base forms, their productivity and overgeneralizations.

PRESENTATION 5:

Acquisition of complex predicates in Pitjantjatjara

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Serial verb constructions (SVCs) occur in approximately one-third of the world's languages (Dixon 2006), yet there are vanishingly few studies of how children acquire them. A greater understanding of the acquisition pathways of SVCs would not only improve our understanding of how children acquire language in all its varied forms but also speak to some of the debates regarding the nature of SVCs and how they compare to other constructions. For instance, acquisition data would shed new light on discussions of whether SVCs are formed through coordination (e.g. Larson 2010) or via various other means. In this paper I present results from the initial stage of a longitudinal naturalistic study investigating the acquisition of SVCs by Pitjantjatjara speaking children.

Pitjantjatjara is a Pama-Nyungan language spoken in central Australia and one of the relatively few Australian indigenous languages still being learnt as a first language by children. It is a synthetic language with split-ergative case marking and a large proportion of morphologically complex derived verbs. The study is based around the community of Pukatja (Ernabella) and follows six children with initial ages ranging between 1 and 3 years. Each child is recorded for at least one hour, four times a year, over three years. As expected based on Fung's (2011) study of the acquisition of SVCs in Cantonese, the initial recordings in this study capture the beginnings of SVC use. The younger children competently use simplex verbs but show no uses of SVCs, while the 3 year old children also use SVCs alongside single verb utterances. These early uses suggest possible implications for the nature of SVCs, how they are acquired, and what we might observe as these children are followed over the coming years.

References

Dixon, R.M.W. (2006). Serial verb constructions: conspectus and coda. In A.Y. Aikhenvald & R.M.W. Dixon (eds.), *Serial Verb Constructions: A Crosslinguistic Typology* (pp. 338–350). Oxford: Oxford University Press.

Fung, S.S. 2011. *The emergence of serial verb constructions in child Cantonese*. Hong Kong: The University of Hong Kong MPhil.

Larson, M. 2010. The empty subject construction: verb serialization in Baule. In E.O. Aboh & J. Essegbey (eds.), *Topics in Kwa Syntax* (pp. 195–232). Amsterdam: Springer.



SYMPOSIUM

Song and Prosody for Early Language Acquisition

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Young infants are very sensitive to the melody and rhythm of speech (Nazzi et al 1998). These prosodic cues help to identify lexical and syntactic units in language, and might thereby serve to bootstrap language learning (Morgan 1986). Prosodic cues are often exaggerated in child-directed speech and in songs. This symposium brings together behavioral and electrophysiological studies from 4 different research groups. We will present the state of the art knowledge about the role and importance of (exaggerated) prosodic cues in early language learning, and discuss the mechanisms through which infants can so effectively use these cues.

The first two papers compare the segmentation of phrases (paper 1) and words (paper 2) from song and from speech. The studies provide evidence that 6- and 10-month-old infants are at least as good in segmenting phrases and words from song as from speech, with paper 1 suggesting a potential song advantage. The third paper looks further into prosodic cues used for segmentation from speech, and finds pitch to be a sufficient cue for word segmentation in 9-month-olds.

Another prosodic cue important in language learning is rhythm. Neurons in the brain process information in a rhythmical way, and can take over the speech rhythm to focus on salient aspects of the input (Lakatos et al 2008). The fourth paper addresses neural entrainment in infants as a possible underlying mechanism of WHY rhythmic cues might be so important for language learning.

Rhythm perception remains important for language learning in older children. The results from paper 5 suggest that individual differences in musical rhythm, speech rhythm, and working memory are related to grammar skills in typically and atypically developing children age 5-7.

The papers together show the importance of prosody for early language learning, shedding light on how children use the music of language for language acquisition.

References

Lakatos, P., Karmos, G., Mehta, A. D., Ulbert, I., & Schroeder, C. E. (2008). Entrainment of neuronal oscillations as a mechanism of attentional selection. *Science* 320(5872), 110-113.

Morgan, J. L. (1986). From simple input to complex grammar. Cambridge, MA: MIT Press.

Nazzi T., Bertoncini J., & Mehler J. (1998). Language discrimination by newborns: toward an understanding of the role of rhythm. *J. Exp. Psychol. Hum. Percept. Perform.*, 24(3), 756-766.

PRESENTATION 1:

Infants' recognition of phrases in song and speech

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Phrasing of acoustic information is a universal phenomenon that can be observed in human speech, song and instrumental music. Here we investigate whether infants are able to exploit the acoustic boundary between phrases to perceptually organize the information in song, as well as in speech.

While infants' ability to segment speech into phrases is well-attested (Nazzi et al 2000; Johnson & Seidl 2008), there is no evidence whether this also holds for songs. Sung phrases, however, can carry even stronger phrase boundaries cues than spoken phrases.

Six-month-old Dutch infants (N=43, final N will be 48) were tested with the headturn-preference pro-

cedure in two sessions: a session with sung stimuli and a session with spoken stimuli (order of sessions counterbalanced between infants). In both sessions, infants were familiarized with two sequences of the same words (familiarization phase) and were then presented with longer passages that contained the familiarized sequences (test phase). While one word sequence was uttered as phrase internal, carrying phrase boundaries at the edges, the other was uttered as phrase straddling, carrying phrase boundaries halfway. There was a significant interaction between condition (phrase internal / straddling) and modality (song / speech) (linear mixed effect model, $X^2=5.25$, $p<.05$). In the song session test phase, infants favored the passage that contained the phrase internal sequence ($X^2=4.95$, $p<.05$). In the speech session, however, we found no difference between looking times to phrase internal or phrase straddling sequences.

These results provide novel evidence for infants' domain general ability to segment acoustic information into smaller constituents, while we fail to replicate infants' ability to segment speech into phrases. Our results might be partly driven by differences between our and earlier studies in experimental design and stimuli. Yet they also shed novel light on the early connections between processing music and speech (Brandt et al 2012).

References

- Brandt, A., Gebrian, M., & Slevc, L.R. (2012). Music and early language acquisition. *Frontiers in Psychology*, 3, 327.
- Johnson, E.K., & Seidl, A. (2008). Clause segmentation by 6-month-old infants: A crosslinguistic perspective. *Infancy*, 13(5), 440–455.
- Nazzi, T., Nelson, D.G.K., Jusczyk, P.W., & Jusczyk, A.M. (2000). Six-Month-Olds' Detection of Clauses Embedded in Continuous Speech: Effects of Prosodic Well-Formedness. *Infancy*, 1(1), 123–147.

PRESENTATION 2:

Segmentation of words from song in 10-month-old infants

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Infant-directed songs are highly rhythmic and melodic. These properties in speech promote word segmentation. Does that mean that infants are particularly good at segmenting words from songs? We exposed forty 10-month-old Dutch infants to songs and stories, in each of which a word was repeated across phrases. Electroencephalography (EEG) was measured, and segmentation of the repeated word was inferred from the ERP familiarity effect (Junge et al 2014), comparing the last two Presentations to the first two Presentations of the repeated word.

We identified a positive shift in the ERP, 300-900 ms after onset of the repeated word, over left frontal electrodes ($p=.004$, corrected for multiple comparisons). This effect did not differ between song and speech sessions ($p>.5$), although the effect was numerically larger in song. This suggests that 10-month-old infants are able to segment words from song, and do so at least as well as from speech. The identified ERP familiarity effect in both speech and song has a positive polarity, similar to previous results in speech with 7-month-old infants (Kooijman et al 2013), but contrary to the negative polarity observed in speech with 10-month-old infants (Junge et al 2014). The positive polarity in the present study might reflect increased segmentation difficulty in comparison to the previous study with 10-month-old infants (Junge et al 2014). Increased difficulty with the speech segmentation may have resulted from the less prosodically exaggerated speech stimuli in the present study (cf., Floccia et al 2016). Increased difficulty with the song segmentation may be due to the fact that infants encounter fewer songs than speech.

These results show that 10-month-old infants are able to segment words from the auditory input provided by songs as well as speech. The enhanced rhythmicity in songs, which was hypothesized to enhance segmentation, is potentially offset by children's relative unfamiliarity with songs for early word learning.

References

- Floccia, C., Keren-Portnoy, T., DePaolis, R., Duffy, H., Delle Luche, C., Durrant, S., ... & Vihman, M. (2016). British English infants segment words only with exaggerated infant-directed speech stimuli. *Cognition*, 148, 1-9.
- Junge C., Cutler A., & Hagoort, P (2014). Successful word recognition by 10-month-olds given continuous speech both at initial exposure and test. *Infancy*, 19(2), 179-193.
- Kooijman V., Junge C., Johnson E.K., Hagoort P., & Culter A. (2013). Predictive brain signals of linguistic development. *Frontiers in Psychology*, 4, 25.

PRESENTATION 3:**When high pitch matters most: Evidence for a pitch-driven segmentation mechanism**

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Infants growing up in stress-timed environments interpret stressed syllables (cued by duration, intensity, spectral energy and often – but not necessarily – by high pitch) as word onsets (Jusczyk et al 1999; Bartels et al 2009), even when stress conflicts with other word boundary cues (Johnson & Jusczyk 2001). In three head-turn-preference experiments, we study the role of the individual stress cues (pitch vs. other prosodic cues) for segmentation by manipulating the alignment of the pitch peak in regard to the stressed syllable in German (aligned or misaligned).

In Experiment 1, nine-month-olds were familiarized with trisyllabic WSW-words in sentence-contexts, with aligned or misaligned pitch peaks. Infants only showed recognition of SW-units in the peak-stress-alignment condition (1.4sec longer looking times to unfamiliarized than familiarized SWwords, $p < 0.05$). Experiment 2 investigated whether high pitch on its own is powerful enough to signal stress. Infants were familiarized with trisyllabic WWSnonce words in an alignment and misalignment condition and tested on the last two syllables of the WWS-word, but with a reversed metrical structure (SW). They only showed recognition of SW-items (1.2sec longer looking times to familiarized items) in the misalignment condition, in which the high-pitched syllable preceded the stressed one ($p < 0.05$). Experiment 3 replicated Experiment 2 with resynthesized materials, in which the f_0 -contour of the misalignment condition was modeled from the alignment condition. Preliminary results also show longer looking times to familiarized SW-items (0.7sec, $n=9$ infants).

These findings suggest that high pitch is a sufficient cue to metrical stress for German nine-month-olds: stressed syllables need to be high-pitched to be perceived as word onsets and infants treat high-pitched syllables as word onsets even though they were unstressed (and lack other prosodic stress cues). Consequently, our findings shed new light on the underlying mechanism of metrical segmentation, revealing that the driving force in this process might be high pitch – rather than other prosodic stress cues.

References

Bartels, S., Darcy, I., & Höhle, B. (2009). Schwa syllables facilitate word segmentation for 9-month-old German-learning infants, 33rd Annual Boston University Conference on Language Development, Somerville, M.A., pp.73-84.

Johnson, E.K., & Jusczyk, P.W. (2001). Word segmentation by 8-month-olds: when speech cues count more than statistics, *Journal of Memory and Language*, 44, 548-567.

Jusczyk, P.W., Houston, D.M., & Newsome, M. (1999). The beginnings of word segmentation in English-learning infants, *Cognitive Psychology*, 39, 159-207.

PRESENTATION 4:**Nine-month-old infants' neural oscillatory entrainment to sung nursery rhymes exceeds their parents'**

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During their early years, infants use the temporal statistics of the speech signal to boot-strap language learning (Morgan & Demuth 1996), but the neural mechanisms that facilitate this temporal analysis are poorly understood. In adults, neural oscillatory entrainment to the speech amplitude envelope has been proposed to be a mechanism for multi-time resolution analysis of the speech signal (Giraud & Poeppel 2012). However, it is not known when this oscillatory analysis mechanism becomes mature during development. Here, we provide a first demonstration that by 9 months of age, infants already show adult-like (or better) oscillatory processing across a wide range of temporal patterns in infant-directed (nursery rhyme) speech.

Typical infants and their mothers (N=58, mean age 9.1 months) concurrently viewed videos of sung nursery rhymes while their neural activity was concurrently monitored using dual-electroencephalography (dual-EEG). The accuracy of infants' and adults' neural oscillatory entrainment to speech was compared by calculating their phase-locking values (PLVs) across the EEG-speech frequency spectrum.

As compared to adults, infants showed markedly enhanced phase-locking to rhyme units (Theta, ~4.5 Hz) and phoneme patterns (Alpha, ~9.3 Hz) and were matched to adults for syllables and prosodic stress patterns (Delta, ~1-2 Hz). By contrast, infants were less accurate than adults at tracking slow (~0.5 Hz) phrasal patterns.

These results demonstrate that neural oscillatory mechanisms mature early enough in development to be able to support infants' encoding of speech temporal patterns and statistics during their sensitive period for phonetic and phonotactic learning. Therefore, oscillatory entrainment could be one neural mechanism that supports early bootstrapping of language learning from acoustically-enhanced forms of spoken language such as nursery rhymes.

References

Giraud, A.L., & Poeppel, D. (2012). Cortical oscillations and speech processing: emerging computational principles and operations. *Nature Neuroscience*, 15, 511-517.

Morgan, J.L., & Demuth K. (1996). Signal to syntax: An overview. In J.L. Morgan & K. Demuth (Eds.). *Signal to syntax: Bootstrapping from speech to grammar in early acquisition* (pp. 1-22). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

PRESENTATION 5:

Why we should take rhythm and working memory into account when investigating grammar skills in children

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A growing body of research shows correlations between language and music skills in children. However, the relationship between rhythm and grammar in typical and atypical language development has received little attention until recently. Musical rhythm and linguistic grammar are both hierarchically organized, and the timing of speech contains relevant cues to grammar. The objective of this line of research is to investigate the role of rhythm in explaining individual differences in language. Here we present a series of studies aimed at understanding the cognitive

and neural mechanisms driving an association between rhythm skills and grammatical development in children.

Children with typical development and specific language impairment between the ages of 5 and 7 participated in a series of experiments. The behavioral test battery includes multiple measures of musical rhythm (Beat-based Advantage task and Primary Measures of Music Audiation), speech rhythm sensitivity (a prosody-matching task, and the Tennessee Test of Rhythm and Intonation Patterns: T-TRIP), grammar (the Structured Photographic Expressive Language Test-3: SPELT-3) and auditory working memory (digit span). Electroencephalography (EEG) paradigms measuring musical rhythm (beat perception) and auditory working memory (1-back task) are also utilized.

Preliminary data in the pooled group (n=17 with typical language and n=3 with SLI) indicate significant correlations between the prosody-matching test and Musical rhythm perception ($r=0.57$), prosody-matching and SPELT-3 (0.50); T-TRIP and Musical Rhythm (0.75); and between 1-back task and SPELT-3 ($r=0.61$) and PMMA ($r=0.64$). Pilot EEG data also indicate that children with larger brain responses to beat perception were more likely to score well on the complex syntax items of the SPELT-3 ($r=0.63$). Preliminary findings suggest that musical rhythm, speech rhythm, and working memory contribute to grammar skills, and will be discussed in light of a concurrent pilot study that uses music training to target grammar skills in children with language impairment.

SYMPOSIUM

Understanding language development at multiple levels of bioecological explanation: Child, family, society and developmental change

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Bronfenbrenner's highly influential bioecological model of human development posits that child development is the result of complex interactions, played out over time, between the child's genetic and biological make-up, their family, school and community and the social and cultural context within which they live (Bronfenbrenner, 1979).

In recent years there has been a growing recognition of the influence of these varying mechanisms and their interactive relationships on the process of Language development and ontogeny of language disorders. Despite this, opportunities to consider language development at multiple levels of explanation are rare.

The Centre of Research Excellence in Child Language brought together experts in molecular genetics, neuro-imaging, epidemiology, biostatistics and health economics to investigate factors that affect and improve child language and development (<https://www.mcri.edu.au/research/centres/centre-research-excellence-child-language>).

In this symposium we will present findings from the CRE-CL, drawing on the Early Language in Victoria Study and the Millennium Cohort and explore different levels of the bioecological framework in turn:

1) the child: neurobiological characteristics associated with Language Impairment (LI) determining if and how they differ from children with Typical Development and Speech Sound Impairments;

2) the family: parenting factors and whether their influences on language outcomes are universal;

3) the school and community: how language difficulties affect children's 'functional outcomes' with respect to literacy, social-emotional adjustment and quality of life at 7 years;

4) developmental change: the levers which predict the rate of language growth from 4 to 7 years; and

5) subgroups in developmental change: the identification of subgroups in language trajectory and the nature and predictors of stable, improving and declining language trajectory groups.

The progress made by the CRE-CL in furthering our understanding of language development and disorders will be discussed and priorities for the future identified.

References

Bronfenbrenner, U. (1979). *The Ecology of Human Development: Experiments by Nature and Design*. Cambridge, MA: Harvard University Press. ISBN 0-674-22457-4

PRESENTATION 1:

Brain structure in children with speech and language impairments: A voxel based morphometry study

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Up to one in five children present with speech and/or language impairment (Eadie et al., 2015; Reilly et al., 2010). While there is clear evidence to suggest a neurobiological contribution in developmental language impairment and speech sound impairment (Liegeois, Mayes, & Morgan, 2014), the precise neural basis of each of these conditions remains poorly understood. This study aimed to determine whether subtle neuroanatomical abnormalities underlie childhood speech and language impairments. The current study used voxel-based morphometry (VBM), an unbiased and automated imaging technique to examine whole brain volumes in

school-age children with a history of speech sound impairment, developmental language impairment, co-existing speech and language impairment, and typically developing children (age range for all groups: 9-11 years), recruited from a longitudinal community cohort. Results indicated childhood speech and language impairments were associated with greater grey matter volumes in the right cerebellum when compared with the age and gender matched control group. Additionally, increased grey matter volumes in the right putamen was detected in the language impaired group when compared to the control group. While the role of the cerebellum and subcortical structures in speech and language function is well established, this study suggests these brain regions are related to the development of childhood speech sound and language impairments. The findings are discussed in the context of genetic, neurobiological and environmental context.

References

Eadie, P., Morgan, A., Ukoumunne, O. C., Ttofari Eecen, K., Wake, M., & Reilly, S. (2015). Speech sound disorder at 4 years: Prevalence, comorbidities, and predictors in a community cohort of children. *Developmental Medicine and Child Neurology*, 57(6), 578-584. doi:10.1111/dmcn.12635

Liegeois, F., Mayes, A., & Morgan, A. (2014). Neural Correlates of Developmental Speech and Language Disorders: Evidence from Neuroimaging. *Curr Dev Disord Rep*, 1, 215-227. doi:10.1007/s40474-014-0019-1

Reilly, S., Wake, M., Ukoumunne, O. C., Bavin, E., Prior, M., Cini, E., Bretherton, L. (2010). Predicting language outcomes at 4 years of age: Findings from early language in Victoria study. *Pediatrics*, 126(6). doi:10.1542/peds.2010-0254

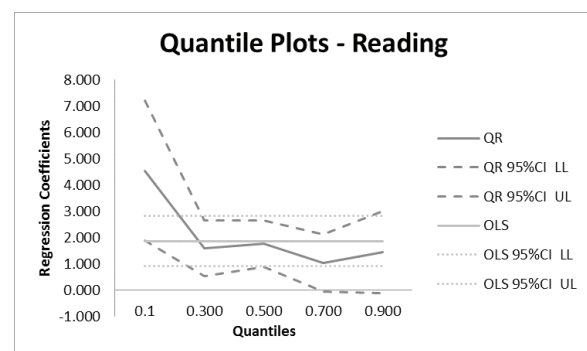
PRESENTATION 2:

Predicting different quantiles of language outcome at eleven years

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A number of studies have identified both positive and negative factors that predict language development. In such cases traditional Ordinary Least Squares (OLS) regression models which are often the default approach may increase the risk of encountering the 'mean focus fallacy' (Hohl, 2009), namely that predictors operate consistently across the distribution of the dependent variable.

Long recognized in econometric modeling of income distribution, quantile regression has the potential to further our understanding of child development and this may be especially relevant to child language (Petscher & Logan, 2014). In this study we used data from 18,000 children in the UK's Millennium Cohort Study assessed on the Verbal Similarities Scale of the British Ability Scales at 11 years. The predictors were child and family factors, home activities and early language skills. The results suggest that the OLS models often misrepresent the distribution of the outcome. In the plot below we look at "reading to the child at three years" as the predictor. If we look at the quantiles we see that early reading has a big effect (5 points difference for the lowest performing children) at eleven years but NOT the rest of the distribution. This pattern is very different for other predictors, some of which fit this patterns and others which do not.



The results have implications for the assumptions we make about linear regression and for the way that potentially we design interventions within a proportionate universal framework.

References

Petscher, Y., & Logan, J. A. R. (2014). Quantile Regression in the Study of Developmental Sciences. *Child Development*, 85(3), 861-881. DOI: 10.1111/cdev.12190

Law, J., Rush, R. King, T., Westrupp, L., Reilly, S. (2017) The association between early home activities and oral language skills in middle childhood: A quantile analysis *Child Development*

PRESENTATION 3:

Language outcomes at 7 years: early predictors and co-occurring difficulties in literacy, social-emotional and behavioural difficulties and Quality of Life (QoL)

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Objective: To examine at 7-years the language abilities of Australian children, the salience of early-life factors and language scores as predictors of language outcome, and the co-occurrence of difficulties associated with low language.

Methods: *Design:* Longitudinal cohort study of 1910 infants recruited at age 8-10 months. *Exposures:* Early life factors - Child gender, prematurity, birth weight/order, twin birth, socioeconomic status, non-English speaking background, family history of speech/language difficulties; Maternal - mental health, vocabulary, education, age; Child language - at ages 2 and 4 years. *Outcomes:* 7-year standardized language scores; low receptive and/or expressive language (scores \geq 1.25 SD below the mean), co-occurring difficulties - autism, literacy, social, emotional and behavioural adjustment, and QoL.

Results: 227/1204 (18.9%) children who provided outcome data met criteria for low language. Early-life factors explained 9-13% of variation in language scores, increasing to 39-58% when child language at ages 2 and 4 years were added. Together, early-life factors moderately discriminated between children with and without low language (area under the curve: 0.68-0.72), strengthening to good discrimination with language scores at ages 2 and 4 (area under the curve: 0.85-0.94). Children with low language at 7 years were more likely to have low IQ, autism, SEB difficulties and literacy difficulties than their peers with typical language and rates of comorbid literacy difficulties were particularly high (37% and 49%). Children with low language were 2-3 times more likely than their peers to have SEB difficulties. To our knowledge this is the first time an association between low language abilities and QoL has been reported in childhood in a community sample. Of concern is that these children were experiencing limitations in school and psychosocial functioning equivalent to those experienced by children with chronic and severe health conditions with

more than twice the frequency reported in their Typically Developing peers.

PRESENTATION 4:

Subgroups in language trajectory from 4 to 11 years: the nature and predictors of stable, improving and declining language trajectory groups

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Recently Zambrana et al (2013) and Snowling et al (2015) suggested that differing 'trajectories' of Language Disorders in early to middle childhood (3 – 5 and 3 – 8 years respectively) may reflect differing aetiological mechanisms with a 'late-emerging group' being most influenced by genetic mechanisms and a 'persisting group' reflecting social risks.

However, these and most studies of language 'trajectory' have a number of limitations. The use of a 'categorical' approach, assigning children to either impaired or unimpaired groups at specific cut-points in language scores at two or more time points is used in many studies but has a number of disadvantages. Measurement error leads to instability in group membership for children whose scores fall near a cut-point and regression to the mean can suggest changes in profile that are artefacts of repeated measurement.

Sampling and measurement issues are also crucial. To yield accurate estimates of the range of language pathways that exist across a population, representative samples are necessary together with repeated robust language measures. Finally longer developmental windows are needed than the 3-5 year periods often studied to fully understand how differences play out over development.

This study aims to meet these methodological challenges through the application of longitudinal latent class analysis to data from a specialist language longitudinal community cohort (the Early Language in Victoria Study).

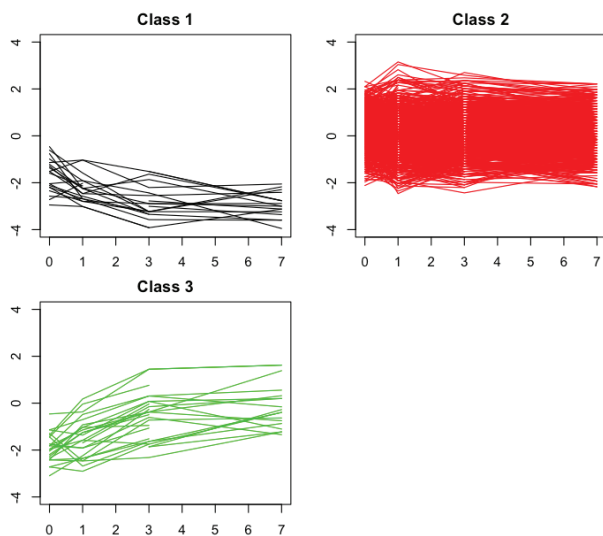
Research questions

Can valid subgroups in *pathways of language development* from 4 – 11 years be derived?

Do ‘persisting’, ‘late emerging’ and ‘resolving’ language difficulties groups exist or are different subgroups present?

Do differing factors predict group membership and hence suggest differing aetiological mechanisms?

Preliminary Results: Analyses suggest 3 distinct language pathways – 1) low-declining; 2) stable; and 3) low-improving. Further analysis will be completed to determine whether it is possible to predict group membership from environmental, biological or social risks.



References

Zambrana IM, Pons F, Eadie P, Ystrom E. Trajectories of language delay from age 3 to 5: persistence, recovery and late onset. *International Journal of Language and Communication Disorders*. 2013.

Snowling MJ, Duff FJ, Nash HM, Hulme C. Language profiles and literacy outcomes of children with resolving, emerging, or persisting language impairments. *Journal of Child Psychology and Psychiatry and Allied Disciplines*. 2015.

PRESENTATION 5:

Levers for language growth: characteristics and predictors of language trajectories between 4 and 7 years

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Background: Evidence is required as to when and where to focus resources to achieve the greatest gains for children’s language development. Key to these decisions is the understanding of individual differences in children’s language trajectories and the predictors of those differences. To determine optimal timing we must understand if and when children’s relative language abilities become fixed. To determine where to focus effort we must identify mutable factors, that is those with the potential to be changed through interventions, which are associated with significant differences in children’s language scores and rate of progress.

Methods: Uniquely this study examined individual differences in language growth trajectories in a population sample of children between 4 and 7 years using the multilevel model for change. The influence of predictors, grouped with respect to their mutability and their proximity to the child (least-mutable, mutable-distal, mutable-proximal), were estimated.

Results: A significant degree of variability in rate of progress between 4 and 7 years was evident, much of which was systematically associated with mutable-proximal factors, that is, those factors with evidence that they are modifiable through interventions with the child or family, such as shared book reading, TV viewing and number of books in the home. Mutable-distal factors, such as family income, family literacy and neighbourhood disadvantage, hypothesised to be modifiable through social policy, were important predictors of language abilities at 4 years.

Conclusions: Potential levers for language interventions lie in the child’s home learning environment from birth to age 4. However, the role of a family’s material and cultural capital must not be ignored, nor should the potential for growth into the school years. Early Years services should acknowledge the effects of multiple, cascading and cumulative risks and seek to promote child language development through the aggregation of marginal gains in the pre-school years and beyond.

SYMPOSIUM

An exploration of parent-child interaction therapy

CONVENER: Margot Zwitserlood, Pento Center for Audiology, Department of Speech and Language disorders, Zangvogelweg, The Netherlands, m.zwitserlood@pento.nl

Parent-child interaction (PCI) therapy is a dominant form of intervention for child language impairments, particularly in the pre-school years. Despite some evidence to suggest that PCI can be effective, this is derived largely from studies of middle class, white, educated families who have volunteered for the studies. This is not necessarily representative of the families who present in clinical contexts. The process of interacting with families and the mechanisms for engaging families is rarely described in detail yet this is potentially critical to the success of interventions. Understanding the perspectives of families and the relationships between practitioners and families may improve how we structure and target these interventions and how practitioners can respond to individual parent preferences for differing approaches. Furthermore, evidence-based practice requires practitioners to apply research evidence appropriately to ensure that interventions meet the needs of individual children and their families. This requires practitioners to judge which components of an intervention can be varied and which must be retained according to the original effectiveness research.

This symposium will report on a number of studies of parent-child interaction therapy identifying the issues that present challenges to the delivery of this approach to intervention for children with language impairment. The purpose of the symposium is to identify important characteristics and components of this intervention approach, clearly distinguishing the mechanisms involved that bring about change in parents and children. One output might be a new research agenda that includes both parent perspectives and practitioner expertise.

The symposium will include a review of evidence supporting PCI interventions, qualitative studies of

practice and parent perspectives and a pragmatic trial of a parent training intervention. The final discussion will encourage delegates to suggest a new research agenda.

PRESENTATION 1:

A critical analysis of the evidence basis of parent-child interaction therapy (PCIT).

Sam Harding, Bristol Speech & Language Therapy Research Unit, U.K. sam.harding@nbt.nhs.uk / **Juliet Goldbart**, Manchester Metropolitan University, U.K. j.goldbart@mmu.ac.uk /

A recent study of evidence-based practice for pre-school children with language impairment found that approaches that focused on the interaction between adults (particularly parents) and children predominate in UK practice. However, the related review of the literature suggested that there were a number of problematic issues related both to the methodology of studies and the theory underpinning those studies. Those issues are summarised here as five questions:

For which children are these interventions appropriate and effective?

Do the assessment processes identify families that need or will benefit from PCIT?

What process is used to determine the combination of strategies that is taught to parents?

What is the method of delivery?

Is effectiveness measured by examining change in the parent, the child or both?

This paper discusses these questions with reference to the wider literature and then draws conclusions in terms of the implications for practice, the unanswered questions and directions for future research.

PRESENTATION 2:

Speech & language therapists' perceptions of parents' engagement in parent-child interaction therapy.

Inge Klatte, University of Applied Sciences, Utrecht, The Netherlands isklatte@gmail.com

Background: Parents play an essential role in Parent-child interaction therapy (PCIT), since they are

the ones that decide if they want to engage in therapy. Unfortunately, speech and language therapists (SLTs) report that parents' engagement is frequently challenging when conducting PCIT.

Research question: What factors do SLTs perceive to be influential in parents' engagement in PCIT?

Methods: This qualitative study recruited ten SLTs who were currently using PCIT with preschool children with language impairments. Semi-structured interviews were conducted using a topic guide. Interviews were recorded, transcribed verbatim and then analysed thematically following Braun & Clark's process of familiarisation, development of codes and then themes. Findings will be displayed using mind mapping diagrams.

Findings: Parents' engagement was identified as one of the potentially critical components of PCIT alongside parents' reflection, parents' understanding and therapists' skills. This Presentation focuses in detail on the factors that were perceived by SLTs to be related to parents' engagement. Those factors included parents' backgrounds, parents' feelings, parents' understanding and the practicalities of PCIT for parents.

Conclusion: In most studies of PCIT, parent engagement is assumed to be present and little is included in evaluations about how best to motivate and increase parent engagement. However, this is a well-researched issue in other fields. The Presentation will conclude with a comparison of factors perceived to be influential by SLTs and findings from other research.

PRESENTATION 3:

Changes in parents' conceptions of roles during their children's speech and language intervention

Karen Davies, University of Manchester, U.K. karen.davies-3@manchester.ac.uk

Background: This paper uses conceptual change theory to explore changes in parents' conception of their role during speech and language therapy (SLT) intervention. Conceptual change has been well documented in education as an important construct in promoting children's learning, but has not been widely explored in adult learning.

Research questions: (i) What conceptions do parents have of their role in supporting speech and language (S&L) development in pre-school children with S&L difficulties? (ii) How do parents' conceptions change during intervention?

Methods: A qualitative, longitudinal study used semi-structured interviews with 15 parents of pre-school children with primary S&L needs. Parents were recruited following first assessments with therapists. Data were collected at three points over thirty weeks and analysed using thematic network analysis for first level themes and framework analysis to track changes in perceptions over time.

Results: Parents had a clear conception of their role as advocates, but did not have a firm conception of role during intervention. They were seeking clarification of what needed doing, but some also showed a readiness to learn how to promote S&L development in a range of contexts. After intervention, many parents described their role as facilitators of their child's S&L, not only implementing, but also adapting specific techniques they had gained, indicating that their conception of role had changed. Two types of changes were described by parents: (i) in conception of their role as leading intervention with their child, and (ii) in their approach to parenting.

Conclusions: Parents described important changes in conception of their role, expressed as thinking differently about being involved in, and leading, their child's intervention. Adopting a conceptual change approach to parent education in SLT could enable parents to conceive of their role as interveners, rather than helpers, and promote greater participation as co-workers with therapists during intervention.

PRESENTATION 4:

Parental feedback in parent-child interaction therapy

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Introduction: In the Netherlands, one of the therapy options for young children with persistent language delays is treatment in special day-care centres. Usual care includes group treatment and individual speech-language therapy (SLT). Parents are offered group meetings and additional counselling. The research question for this study was: 'is parental training with feedback more effective than usual care?'

Design: Randomized controlled clinical trial.

Methods: Participants were forty monolingual children randomized to the intervention group or the

control group. All children were measured two times following baseline measurement (T0), i.e. six months (T1) and one year (T2) later. Measurements included standardized language tests and analysis of language samples, parent-child interaction variables and children's quality of life (QOL). The children included in the study had severe language delays as well as a reduced QOL. Parent's number of utterances and mean length of utterance at baseline were three times as high as their children's.

Parents in the intervention group learned language facilitating techniques (LFT) in 12 sessions once every two weeks. SLTs modelled LFT for parents and coached the parents practising LFT with their child. Parents applied LFT at home during daily routines. Treatment was tailor-made to children's needs and parental capacities. Parents in the control group did not attend the SLT sessions of their children. SLT for children in the control group consisted of non-protocolled treatment.

Results: Preliminary results indicate that SLT's enjoyed working with the intervention programme. They reported that the programme is effective and feasible. Parents were highly compliant and feel more skilful in applying LFT in the interaction with their child. Parents felt more competent in helping their child. At the congress results of time and group differences will be presented.

Conclusion: Parental training with feedback is a promising treatment for young children with speech-language delays.



DAY
3

WEDNESDAY, 19TH

14:00-16:00,

AMPHI LUCIE AUBRAC

SYMPOSIUM

Bookreading interactions at home and at school: Promoting narrative production and comprehension

CONVENER: Ageliki Nicolopoulou, Lehigh University, U.S.A, agn3@lehigh.edu

DISCUSSANT: Catherine Snow, Harvard University, U.S.A.

Bookreading is a rich context that offers young children opportunities to hear complex language and to encounter a wide range of storylines that can help enrich and stimulate their knowledge, reasoning, and imagination. This symposium focuses on current research on bookreading with ethnically diverse families and teachers interacting with children from challenging backgrounds, including bilingual children. Our focus departs from a wide range of bookreading intervention research that helps promote vocabulary and emergent literacy skills; it supplements this picture by indicating how bookreading can help go beyond vocabulary and literacy skills in promoting not only narrative skills but also complex reasoning abilities evidenced by narrative comprehension.

The first paper demonstrates that the language of Latino Spanish-speaking mothers with their 4-year-olds during bookreading helps promote the narrative production of these children, with maternal vocabulary diversity and sophistication being the strongest predictors. This picture of what contributes to school readiness skills in ethnically diverse families is nicely enriched by the second paper which shows that beyond the frequency of bookreading, narrative style and especially the type of maternal questions help contribute to increasing language and narrative skills among children both concurrently and longitudinally.

The next two papers focus on how preschool teachers can engage children in enriching bookreading interactions. The third paper delves further into type of teacher questions indicating that high-level and persistent inferential questions (as opposed to literal questions or statements) are most beneficial for children's understanding of picture books. The final paper indicates how a book-based language

enhanced program with young bilinguals promotes their narrative and perspective-taking abilities.

The four papers as well as the discussant will highlight the type of bookreading interactions most successful in promoting narrative production and comprehension skills.

PRESENTATION 1:

Latino Mothers' Language Input during Wordless Book Sharing and Children' Narrative Skills

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Caregiver-child booksharing plays a critical role in scaffolding children's reading-readiness. As such, many interventions efforts have aimed to increase the frequency of adult-child book reading in the homes of children with the greatest risk for academic difficulties, most notably in the U.S., children from low-income Latino communities. The few studies examining booksharing practices in Latino homes document that caregivers rely more on the pictures than on the text, treating pictures books as wordless. This practice is especially salient for Spanish-speaking parents with little access to Spanish-language text-based books, and/or limited reading abilities. Interestingly, researchers and educators have recently recommended the sharing of wordless books at home and school to support preschoolers' emergent literacy. Nonetheless, relatively few studies have examined the predictive relation between Latino caregivers' language and their children's early literacy skills the context of wordless booksharing. Thus, the present study examined various features of Latino caregivers' language in this context and their relation to children's narrative production and comprehension.

Thirty-two low-income, Latino, Spanish-speaking mothers and their four-year-olds participated in the study. Dyads shared a wordless picture book at the beginning of the school year and children's narrative production and story comprehension were assessed concurrently and at the end of the school year. Language interactions were transcribed using a standardized format. Mother-child interactions were coded for caregivers' elaborative discourse, lexical diversity and sophistication, as well as syntactic complexity, whereas children's narrative productions were coded for conversational autonomy, macrostructure, and microstructure. Preliminary results indicate that caregivers' overall language sophistication is predictive of children's narrative production and comprehension skills, with vocab-

ulary diversity and sophistication serving as the strongest predictors across child outcomes. Results are discussed in relation to the importance of caregiver-child wordless picture book sharing to support Latino children's reading readiness. Implications for research and practice will be discussed.

PRESENTATION 2:

The Benefits of Bookreading Experiences in Early Childhood

Catherine S. Tamis-LeMonda, New York University, U.S.A. catherine.tamis-lemonda@nyu.edu / **Rufan Luo**, Temple University, U.S.A. rufan.luo@temple.edu

Bookreading is an unparalleled context for children's developing skills. Books offer children opportunities to hear words they would not encounter in everyday life; books teach children that letters comprise words to combine into the sentences of a story; and books expand children's knowledge and stimulate their imaginations. During booksharing, adults often encourage children to contribute to the storyline, reason about what will happen, and draw inferences about characters' intentions and emotions—experiences that are foundational to school readiness. In three studies, we examine children's bookreading experiences in relation to children's language, cognitive, and narrative skills in U.S. ethnically diverse families.

Study 1 asked whether the frequency of bookreading promotes children's cognitive and language development in 2,500 children followed from 1 to 3 years. Mothers' bookreading with children predicted language and cognitive performance at 3 years through a cascading effect: Early, consistent bookreading led to vocabulary growth, which predicted cognitive performance.

Study 2 (n=270), examined relations between mothers' narrative styles and their 4-year olds' narrative skill, coded from video-recordings during sharing of a wordless book. Mothers' narrative questions (but not statements) related to children's narrative contributions, which in turn predicted children's independent narratives a year later.

In Study 3 (n=235), sequential analyses examined temporal associations between types of maternal questions and sophistication of children's narrative contributions. Mothers' referential questions ("What's that?") led to children's low-level object descriptions, whereas behavioral/inferential questions ("What's he doing?" "How does she feel?") elicited high-level behavioral/inferential contributions. Reciprocally, levels of children's narrative contributions predicted follow-up questions by mothers. Finally, access to specific types of books

explained mothers' questions and child contributions. Children's access to pre-academic books (e.g., numbers, letters) related to low-level questions by mothers and did not predict children's contributions, whereas children's access to narrative books (e.g., folk tales, stories) related to children's high-level narrative contributions.

PRESENTATION 3:

Interactive Bookreading: Promoting Inferential Talk and Narrative Comprehension

Ageliki Nicolopoulou, Lehigh University, U.S.A. agn3@lehigh.edu / **Kathryn Leech**, Harvard University, U.S.A. kathryn_leech@gse.harvard.edu

This study examines whether a teacher's questions during an interactive bookreading with her entire preschool classroom facilitate children's narrative comprehension. Promoting narrative comprehension, which requires making connections, inferences, and predictions, has not received much attention during these early years. Reading researchers (Cain & Oakhill, 1999) have demonstrated that this ability is critical in differentiating good and poor comprehenders. Thus, finding ways to promote narrative comprehension may be critical in preventing reading difficulties (van Kleeck, 2008).

This study investigates change over time within one classroom to capture whether and how teacher questions serve as a way of improving children's narrative comprehension. We hypothesize that teachers' inferential questions (Why did he do that?) encourage children to think more deeply about the story-plot, evidenced by their semantically appropriate responses. Thus, through repeated engagement with the process of teacher probing questions while insisting for appropriate responses, children come to develop more complete story comprehension.

We analyzed monthly bookreading interactions (N=6) and we assessed children's narrative comprehension at the beginning and end of the year using two not-previously-read books. Being read each of these books, AA low-income children (N=12) were asked literal (what) and inferential questions. All teacher questions during bookreading were coded as increasing levels of literal and inferential (Tompkins et al., 2012) and children's responses as increasing levels of appropriate answers.

Across all bookreadings, this teacher asked more inferential (75%) than literal questions and children's appropriate responses improved over the year. Additionally, children's narrative comprehension markedly improved from pre- to posttests for

both books (book 1: $p > .001$, $\eta^2 = .70$; book 2: $p > .001$, $\eta^2 = .84$). We will present evidence that the teacher's repeated, high-level inferential questions over the year helped children see the connections between story content by promoting their abilities to draw inferences, make connections, and predictions, which in turn promoted their general narrative comprehension.

References

Cain, K., & Oakhill, J. V. (1999). Inference making ability and its relation to comprehension failure in young children, *Reading and Writing*, 11, 489–503.

Tompkins, V., Zucker, T. A., Justice, L. M., & Binci, S. (2012). Inferential talk during teacher– child interactions in small-group play. *Early Childhood Research Quarterly*, 28, 424–436.

van Kleeck, A. (2008). Providing preschool foundations for later reading comprehension: The importance of and ideas for targeting inferencing in storybook-sharing interventions. *Psychology in the Schools*, 45(7), 627–643.

PRESENTATION 4:

Book-based interventions support young bilinguals' narrative and perspective-taking skills

Vibeke Grøver, University of Oslo, Norway vibeke.grover@iped.uio.no / **Veslemøy Rydland**, University of Oslo, Norway veslemoy.rydland@iped.uio.no

Research question: A growing body of research suggests that teachers' use of challenging, inferential talk during book sharing may foster children's vocabulary skills (Dickinson & Porche, 2011). Less is known about the potential impact of shared bookreading on children's narrative and perspective-taking skills. The present study examined the effects of receiving a year-long book-based language enhancing program, EXTEND, on young bilingual children's second-language narrative and perspective-taking skills. In addition to discussing targeted words with the children, the teachers in the program were supervised in how to encourage reasoning and identify narrative perspectives.

Methods: The study was designed as a cluster-randomized trial and included 464 bilingual children in 123 classrooms serving children aged 3–5 years in the larger Oslo area. The children spoke a variety of first languages while Norwegian was their second language. Narrative and perspective-taking skills were individually assessed before and after the intervention using a wordless picture book (Alborough, 2002). The children were first invited to tell the narrative from the perspective of the main protagonist (a monkey baby), then to retell the nar-

rative from the perspective of a more distant character in the book (an elephant baby). The narratives were audiotaped and transcribed. Narrative skills during the first telling were assessed using the coding conventions developed by Luo et al. (2014). Perspective-taking skills were demonstrated during the retelling if the child shifted narrative perspective to the more distant character.

Results and conclusion: EXTEND participation resulted in an increase in narrative skills ($F = 4.95$, $p < .05$) as well as in perspective-taking skills ($F = 4.80$, $p < .05$). Recent research on children in bilingual environments suggests that perspective-taking skills are sensitive to qualities of experience and exposure. The results of the present study offer support to claims that narrative and perspective-taking skills may be instructionally supported during shared bookreading.

References

Alborough, J. (2002). *Hug*. Cambridge, MA: Candlewick Press.

Dickinson, D. K., & Porche, M. V. (2011). Relation between language experiences in preschool classrooms and children's kindergarten and fourth-grade language and reading abilities. *Child Development*, 82 (3), 870–886.

Luo, R., Tamis-LeMonda, C., Kuchirko, Y., Ng, F. F., & Liang, E. (2014). Mother-child book-sharing and children's storytelling skills in ethnically diverse, low-income families. *Infant and Child Development*, 24, 402–425.

DAY
3

WEDNESDAY, 19TH

14:00-16:00,

AMPHI JEAN-BAPTISTE SAY

SYMPOSIUM

Multiple perspectives on mechanisms of lexical acquisition

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Word learning is more than simply associating a referent to a new word form. Children infer the meanings of individual words in relation to other words they have learned. Through this process, they acquire knowledge about the nature of the lexicon, such as language-shared or universal semantic patterns underlying the lexicon, and they use this knowledge to learn new words. In short, children's lexicon continuously expands and evolves, not only in terms of vocabulary size but also in terms of knowledge about the lexicon and the ability to apply that knowledge to learn new words more precisely. The four papers in this symposium explore different aspects of this recurrent bootstrapping process in lexical acquisition. The first paper discusses how children's use of the principle of contrast develops and how this development drives lexical acquisition. The second paper presents how children use novel words to refine and broaden their concepts of event force dynamics, which should in turn propel further verb learning. The third paper examines how the ability to separate relevant from irrelevant information in an event influences novel verb learning develops, focusing on the role of comparison and structural alignment. The last paper explores development of the color word lexicon, highlighting the role of contrast in the initial mapping of basic color words to perceptual referents as well as in a later gradual process of restructuring and refining the mapping to match language-specific boundaries. Thus, the symposium will include new evidence of noun, verb, and adjective learning, as well as varied mechanisms which may underlie their acquisition.

PRESENTATION 1:

Contrast and Convention in Meaning Acquisition

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Observational studies of children's spontaneous meaning assignments strongly suggest they depend on convention—they take up adult word forms, and on contrast—they assign distinct meanings to distinct forms. Experimental evidence from word learning studies also supports this view, but a fuller test would be to offer children the option of assigning the same meaning to two distinct forms. Do children assign contrasting meanings? In Study 1, when asked to perform actions using a flexible jointed doll and various props, children (aged 2;0-5;8) consistently chose distinct actions for different verbs, and did so even when the verbs involved the same body-part (e.g., *kick* and *foot*). In short, they observed the principle of contrast, that different forms carry different meanings. And in repeated uses of the same verbs, they were consistent in the action chosen, providing evidence that they keep track of the meaning they have assigned.

In a second study, when asked to judge which of two puppets had offered the 'right' description for a picture, by using either an innovative denominal verb or the conventional verb for the action in question (e.g., for a picture of a scales, use of **to scale* vs. *to weigh*), the youngest children (3;3) were just above chance in choosing conventional verb forms; by 3;8, children favored 75% of conventional forms; and by 5;3, they did this 95% of the time. In sum, children's growing preference for conventional forms shows that they give them priority over novel forms with the same meaning; their rejection of the novel forms here shows they rely on contrast (two distinct words may not carry the same meaning).

PRESENTATION 2:

Building a better event: How language highlights force dynamics

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Infants are adept at carving events into categories, such as those based on paths, manners, and goals of motion, that form the basis for language (Choi, 2006). A hallmark of this process is the facilitative role for language in highlighting how this information is packaged in verbs (Choi, 2006). We consider how language may facilitate attention to a specific feature of event structure: *partonomic hierarchies*. Partonomic hierarchies refer to how events defined by smaller boundaries, such as one child pushing another, can be integrated into broader categories, such as a child *preventing* another from reaching a flag (Zacks, & Tversky, 2001). *Force dynamics* provides a semantic framework for studying par-

tonomic hierarchies, introducing broad categories (e.g., *prevent*, *help*) that are defined by patterns of previously independent relations, such as *paths* (*towards*), *goals* (*flag*), and *causes* (*pushing away*) (Wolff, 2007). We use force dynamics to explore how language may help children *integrate* independent relations into higher-order constructs.

Twenty-seven 4-year-olds ($M=4.41$ yrs) viewed an animated event depicting two characters engaging in one of four force dynamics relations (*cause*, *help*, *prevent*, *despite*). Across 24 trials, children identified which of two perceptually varied events (different settings/characters) depicted the same relation. An additional 27 four-year-olds ($M=4.33$ yrs) completed the same task with syntactic and word-level cues (e.g., "The diamond *blicked* the circle go to the house! Where is the triangle *blicking* the square go to the house?").

Without linguistic cues, children showed no evidence of encoding force dynamics; however, children attended to force dynamics when given linguistic cues, though imperfectly. Children seemed to integrate the causal action and endstate, but continued to neglect the patient's initial path relative to the goal. In sum, children used language to integrate simple relations into broader, meaningful events, providing perspective on how they navigate these hierarchies en route to mature event representations.

References

- Choi, S. (2006). Influence of language-specific input on spatial cognition: Categories of containment. *First Language*, 26(2), 207-232.
- Wolff, P. (2007) Representing causation. *Journal of Experimental Psychology: General*, 136, 82-111.
- Zacks, J. M., & Tversky, B. (2001). Event structure in perception and conception. *Psychological Bulletin*, 127, 3-21.

PRESENTATION 3:

Comparison can help children align elements of events, and subevents, when learning new verbs

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Most verb studies have examined how children learn verbs after seeing relevant events, but in everyday contexts, children must learn verbs while seeing relevant and irrelevant events (and subev-

ents). For example, a child may hear "stir" while seeing stirring, chopping and washing in the kitchen. One cue that could help children focus on relevant events is comparison across repeated events. In Structural Alignment theory (e.g., Gentner & Namy, 1997), related events will be easier to align and compare, while irrelevant events will not align and thus can be ignored. In Study 1, English-speaking 2 1/2-year-olds ($n=23$) and 3 1/2-year-olds ($n=22$) saw events and heard verbs in one of three orders: Target First (TTDDT), Distractor First (DTDDT), or an Alternating condition (TDTDT). Videos shown on an iPad depicted naturalistic events in a kitchen and park. Each child learned two verbs and pointed at test. Analyses showed no differences by order, but a change over age with 3 1/2-year-olds learning the verbs better than 2 1/2-year-olds.

A more difficult, related task is segmenting the dynamic action around them into parts that are linked to a specific verb. In Study 2, 2 1/2- ($n=20$), 3 1/2- ($n=25$), and 4 1/2-year-olds ($n=12$) saw events in which there was an initial irrelevant action that flowed into a key action (Distractor First condition) or a key action that flowed into an irrelevant action (Distractor Last condition). Again, analyses showed no effect of order, but differences by age, with 3 1/2- and 4 1/2-year-olds succeeding, and performing better than 2 1/2-year-olds. Overall, by 3 1/2 years, children are able to ignore irrelevant whole events and subevents during verb learning, perhaps because relevant events are easier to align and compare.

References

- Gentner, D., & Namy, L. L. (2006). Analogical processes in language learning. *Current Directions in Psychological Science*, 15(6), 297-301.

PRESENTATION 4:

The role of contrast in constructing the color lexicon: from the initial mapping to later boundary delineation

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To acquire adult-like word meanings, children need to construct a system in which the clusters of words in each semantic domain are mutually related and in which the boundaries between these words are delineated in accord with the convention of the linguistic community (Clark, 1973). To investigate the developmental trajectory of the color lexicon acquisition, which is notoriously difficult for children (Pitchford & Mullen 2003; Wagner et al., 2013), we

conducted two studies. Study 1 examined how children who knew few color words became able to map eight basic chromic color names (*red, blue, yellow, green, purple, pink, brown, orange*) to their typical referents, by testing 50 Japanese-reared children every month, starting at 24-months of age. In Study 2, Japanese-speaking 3-, 4, and 5-year-olds and adults (20 of each) were tested on their naming of 93 samples of both chromatic and achromatic colors.

The two studies together showed that children go through a process of continuous reorganization of the color lexicon, whereby *contrast* plays a key role. At first, children mapped *red, yellow, blue* to their typical referents, and overextended these words to other colors. As other color names came into their vocabulary, they started to use newly-coming words for the colors they did not yet know the name often erroneously, for example, e.g., consistently switching *brown* and *purple*, or using them for naming all not-yet-mapped colors, guided by *contrast*. Study 2 revealed that, even when the 8 basic chromatic color names have been correctly mapped to their typical referents, children continue to adjust category boundaries between neighboring words. In this process, the entry of Japanese-unique basic words (e.g. *mizuiro* (light blue), *kimidori* (yellow-green)) plays an important role, inviting further contrast among already-existing words and leading to refinement of the boundaries of each word in the color lexicon.

References

Clark, E. V. (1973). What's in a word? On the child's acquisition of semantics in his first language. In T. E. Moore (Ed.), *Cognitive development and the acquisition of language* (pp. 65-110). New York:Academic Press.

Pitchford, N., & Mullen, K. (2003). The development of conceptual colour categories in pre-school children: Influence of perception on categorization. *Visual Cognition*, 10, 51-77.

Wagner, K., Dobkins, K., & Barner, D. (2013). Slow mapping: Color word learning as a gradual inductive process. *Cognition*, 127, 307-317.

SYMPOSIUM

Children's Understanding and Use of Sociolinguistic Variation in Language Acquisition

Conveners and Discussants: Laura Wagner, Ohio State University, U.S.A., wagner.602@osu.edu/ Cynthia G. Clopper, Ohio State University, U.S.A., clopper.1@osu.edu

In classic conceptions of language development, children's task is to make generalizations (about phonemes, words, structures) across noisy input. However, as sociolinguists have long known, some of that noise is actually systematic variation that provides important information about the identity of the talkers, such as what language they speak or where they are from. This symposium examines children's developing skill with this kind of linguistic variation within the larger context of language development.

The first talk examines a broad age range to determine when children link talkers of different linguistic varieties to different regions as well as to different social attitudes. The second talk considers how children's own prior exposure to different amounts of linguistic variation might influence their sociolinguistic skills. The third talk asks how children cope with linguistic variation when processing meaning in speech. And the fourth talk asks how children's exposure to multiple variants interacts with their word learning strategies.

As these talks, and the final discussion, will make clear, linguistic variability connected to the region and/or language of origin of the talker is a core element of linguistic knowledge. Not only must it be mastered by children as part of adult-like sociolinguistic competence, but it is also a feature that influences children's processing and use of their own input. This symposium will highlight state-of-the-art research in this domain and emphasize the importance of considering the richness of children's linguistic environments.

PRESENTATION 1:

Examining the development of sociolinguistic competence across the lifespan

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From simply listening to people speak, adults can tell where people are from and have a variety of opinions about them. This sociolinguistic knowledge is an important dimension of language development, but its developmental timecourse is unclear. The range of language varieties, tasks, listener populations, and ages used across the previous literature makes it difficult to reconcile inconsistent findings. The current study tested 1530 listeners from a single listener population ranging in age from 4 to 86 years old in a series of tasks tapping sociolinguistic abilities with the aim of establishing when children's earliest competencies develop as well as when children achieve adult-like skills.

The study focused on regional dialects of American English, with female talkers from the Midland, Northern, Southern, and New England regions. All listeners were native speakers of American English tested in Ohio. Listeners' beliefs about the talkers' regions of origin were investigated through four tasks: ad-hoc identification, place-based discrimination, free classification, and locality rating. Listeners' social attitudes about the talkers were also assessed with rating tasks.

The results suggested that the foundations of sociolinguistic ability – at least with respect to understanding regional variation in speech – are in place by age 4 years, earlier than many previous investigations have reported. These young children were able to differentiate at least some of the dialects in terms of both region of origin and social attitudes, although there were clear differences in success across the range of tasks. Adult-like skill levels, however, were achieved more slowly across development; with some dialects and tasks, children performed like adults at age 8 years, but for others, they continued improving until age 17 years. These results suggest that the development of full sociolinguistic competence is gradual, reflecting accumulated exposure to language variation and community attitudes.

PRESENTATION 2:**“No Mummy, it’s a b[a:]th not a b[æ]th!” The effects of language background and exposure on the processing of accented speech by monolingual and bilingual children**

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Recent increases in complex international migration patterns have led to increasingly diverse communities, particularly within large urban centres (e.g., Vertovec, 2007). In these communities, native, monolingual, children encounter not just different native regional accents but also foreign-accented speech. Children raised bi- or multilingually are likely exposed to still more variability; accented speech in their home and host community languages as well as foreign-accented speech. In contrast, those raised in more homogeneous, monolingual speech communities likely experience less variation. This study investigates whether children’s ability to process accent variation is affected by language background and exposure, i.e., whether they are raised in a multilingual, multicultural urban city (inner London) or in a monolingual, suburban community in London (Hampton, Middlesex).

Sixty monolingual [30 London, 30 Hampton] and 30 bi-/multilingual children aged 4-7yrs were tested in their ability to comprehend and categorize talkers produced in the accent of their local community (London), an unfamiliar regional accent (Derbyshire) and an unfamiliar foreign accent (Spanish-accented English). Children completed a standardized vocabulary test (BPVS; Dunn & Dunn, 2009), a comprehension task, in which they heard either the unfamiliar regional or unfamiliar foreign accent, and finally, a categorization task in which they heard stimuli from the accent presented in the comprehension task contrasted with the other unfamiliar accent or their local accent.

All children performed above chance in the comprehension task, but language background significantly affected children’s ability to categorize talkers. Monolingual and multilingual children were able to discriminate home from foreign-accented speech, but only multilinguals could reliably discriminate home from unfamiliar regionally-accented speech. Additionally, monolingual urban (London) children performed significantly better overall than monolingual suburban children (Hampton). Taken together, the results suggest that differences in early exposure to variation in the language environment lead to differences in the processing of sociolinguistic variation.

References

Dunn, D.M. & Dunn, L.M. (2009). The British Picture Vocabulary Scale. National Foundation for Educational Research in England and Wales. GL Assessment London.

Vertovec S. (2007). Super-diversity and its implications. *Ethnic and Racial Studies*, 30 (6): 1024-54

PRESENTATION 3:**Children’s dialect and foreign-accent perception in noise**

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Adults are highly accurate at understanding non-native-accented sentences in quiet and only suffer performance deficits in noise, whereas school-aged children have difficulty under both conditions. In a pair of studies, we investigated whether these findings extend to children’s perception of an unfamiliar native dialect and if children’s difficulty understanding nonnative-accented sentences in noise could be moderated by semantic context. Monolingual American English-speaking children between 5 and 7 years and adults between 18 and 35 years with reported typical hearing, speech, and language were included. In Study 1, 90 children and 96 adults repeated sentences in quiet and 8-talker babble that were produced by three female talkers representing the following speech varieties: familiar native dialect (Midland), unfamiliar dialect (British), or nonnative accent (Japanese). Results suggested that while adults’ perception of nonnative-accented speech is highly influenced by noise, their perception of a less familiar native dialect is robust enough that performance suffers only when noise levels are so high that native dialect perception also suffers. Conversely, children appear to have more fragile rePresentations of the less familiar dialect. In noise, their perception of the native dialect remained robust, but their perception of the British talker declined by 20% and the Japanese talker by 40% relative to that of the American talker. In Study 2 (Authors, in press), 168 children repeated Mandarin- or native-accented sentences in 8-talker babble – half contained final words that were highly predictable from context. The high- and low-predictability sentences contained the same final words. The oldest children benefited most from context. Performance gain from context was similar for both accents. In summary, children’s perception of both nonnative and unfamiliar dialects are more influenced by noise than adults, but

contextual cues can enhance their understanding of nonnative-accented speech in noise, despite its significant acoustic-phonetic differences from native norms

References

Holt, R. F. & Bent, T. (2017). Children's use of semantic context in perception of foreign-accented speech. *Journal of Speech, Language, and Hearing Research*, 60, 223-230.

PRESENTATION 4:

Multidialectal toddlers use of the Mutual Exclusivity in novel word learning

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Monolingual toddlers use Mutual Exclusivity to identify the referent of a novel word from 17 months old (Halberda, 2003). On the other hand, the earliest bilingual children have been found to use this strategy is 24 months and only in certain circumstances. Trilingual children have not yet been found to use this strategy at all (Byers-Heinlein & Werker, 2009). Crucially, Mutual Exclusivity relies on the assumption that objects have a single label which does not hold for multilingual toddlers, each object has a name in each of the languages they are learning.

A sub-category of monolingual toddlers that have been likened to bilinguals are those hearing at least 2 dialect variants of a single language. Indeed, differences have been identified between monodialectal and multidialectal populations in terms of familiar word recognition (Durrant et al., 2014). This study explores the idea that dialect variation may influence Mutual Exclusivity use in multidialectal toddlers.

Following Halberda (2003), 18, 21, and 24 month old monodialectal and multidialectal toddlers saw pairs of images split across three trial types: Known-Known, Known-Unknown and Unknown-Known. Mutual Exclusivity can be exploited to map the novel label to the novel object in the Unknown-Known trials only.

None of the 48 18 month olds showed evidence of using Mutual Exclusivity (Unknown-Known trials - $t(46) = .59$, $p = .56$). At 24 months all 32 toddlers succeeded in selecting the intended referent (Unknown-Known trials - $t(31) = -3.88$, $p = .001$). Preliminary analyses with data from 23 toddlers aged 21

months find monodialectals use Mutual Exclusivity (Unknown-Known trials - $t(17) = -2.97$, $p = .009$) but multidialectals do not (Unknown-Known trials - $t(4) = -.61$, $p > .05$).

These results draw parallels with the monolingual and bilingual findings with increased variation in the input delaying the use of Mutual Exclusivity in multidialectal toddlers.

References

Byers-Heinlein, K., & Werker, J. F. (2009). Monolingual, bilingual, trilingual: infants' language experience influences the development of a word-learning heuristic. *Developmental science*, 12(5), 815-823.

Halberda, J. (2003). The development of a word-learning strategy. *Cognition*, 87(1), B23-B34.

SYMPOSIUM

Methodological considerations for studying on-line sentence processing in children using event-related potentials

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One of the key goals of language acquisition research has long been to understand how and when children become competent speakers of language. Behavioural studies have provided an abundance of perception and production evidence regarding children's developing knowledge of language (Gleason & Ratner, 2016). In contrast, there has been much less research on the neural processes underlying this linguistic knowledge (Friederici, 2006; Brandt-Kobele & Höhle, 2014). In particular, it remains unclear how children process various types of information, and the on-line dynamics underlying these processes.

Event-related potentials have been shown to be an excellent research tool for exploring these dynamics: Because of their high temporal resolution, ERPs have been used extensively to study language processing in adults. In light of this, there has been an increasing attempt in adapting existing adult ERP studies to study language processing in children. However, children are still undergoing development and do not have the full cognitive and language capabilities as adults. Methodological implications for exploring the development of language processing in the brain include the design of experimental stimuli, the choice of experimental paradigm, and the protocols used for data analyses. Critically, most adult research has used the visual (reading) modality, whereas research with children may be more ecologically valid using the auditory modality.

To this end, this symposium brings together four papers to discuss the effect of these methodological considerations on the study of various types of

linguistic processing in children. Each paper will focus in detail on one (or more) of these methodological considerations. The symposium will end with concluding remarks from a discussant. The overall goal of the symposium is to provide a framework to stimulate more research on the neural processing in children, thereby providing greater insight into the development of language processing in children.

References

Brandt-Kobele O.-C., Höhle B. (2014). The detection of subject-verb agreement violations by German-speaking children: an eye-tracking study. *Lingua*, 144, 7-20.

Friederici, A. D. (2006). The neural basis of language development and its impairment. *Neuron*, 52(6), 941-952.

Gleason, J. B., & Ratner, N. B. (2016). *The development of language* (9th ed.). Boston: Pearson.

PRESENTATION 1:

Morphosyntactic event-related potential development in children: A review

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Although young children show relatively systematic linguistic behavior, they are often unable to perform meta-linguistic tasks. For instance, young children make very few errors when producing noun phrases in French (Roulet-Amiot & Jakubowicz, 2006). We know that they show sensitivity to certain linguistic structures but this sensitivity is not revealed in meta-linguistic grammaticality tasks. Furthermore, their language comprehension is not easy to assess. Evaluating auditory language processing using event-related potentials (ERPs) allows us to evaluate language acquisition and processing while avoiding formal testing and/or using written input. Recently, a number of ERP studies have examined the development of morphosyntactic agreement in children, but few literature reviews cover this topic (Friederici, 2005). However, many challenges are present when using ERPs with children, and several biases or inconsistencies are found in research results. For instance, stimuli without the same syntactic complexity and acquisition rate in children development are compared, or the data analysis does not take account of the multiples eye movements of children. First we will discuss recent ERP findings on agreement morphosyntax development in language research with children speaking English, French Italian or German, while highlighting

the inconsistencies or biases in these findings in terms of stimuli, design and data analyses. By doing so, we aim to shed light on the potential in using ERPs to better understand child language development and processing.

References

- Friederici, A. D. (2005). Neurophysiological markers of early language acquisition: from syllables to sentences. *Trends in Cognitive Science*, 9(10), 481-488.
- Roulet-Amiot, L., & Jakubowicz, C. (2006). Production and perception of gender agreement in French SLI. *Advances in Speech Language Pathology*, 8(4), 335-346.

PRESENTATION 2:

The neural correlates of gender and semantic processing in children: Age and proficiency effects

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Acquisition of adjective gender agreement in French is difficult because of irregular morphophonological. Neurocognitive processes underlying gender acquisition have just started to be investigated (Friederici, 2005). This study describes neural responses to gender and semantic processing in children, and examines whether these can be correlated with age or grammatical abilities.

Forty French-speaking children aged 4-9 listened to sentences describing objects pictured on a screen while recording their electroencephalogram (EEG). Ninety-two correct auditory sentences (1) were cross-spliced to create adjective agreement errors (2). A visual-semantic error condition was created by presenting incongruent images (e.g., a green hat) with correct sentences.

- (1) Je vois un soulier vert sur la table
'I see a green shoe on the table'
I see a shoe green.MASC on the table
- (2) Je vois un soulier *verte ...
I see a shoe.MASC green.FEM ...

We analyzed event-related potentials (ERPs) for correct sentences versus gender errors or semantic incongruities. For each condition, we analyzed mean amplitudes and baseline-independent peak-

to-peak differences. Mixed-model linear regressions introduced factors such as Age and Grammatical abilities measured with linguistic tasks.

On average, children show a biphasic N400 + P600 to both error types. In the agreement condition, the N400 suggests that children rely at least partly on lexical-semantic cues to process agreement. In the semantic condition, the P600 suggests that children undergo sentence repair mechanisms for semantic incongruities. Finally, we observed that the magnitude of ERP responses to both kinds of violations was positively correlated with the ability to judge and correct erroneous sentences offline.

The novel combination of ERPs with mixed-model analyses allows us to show that ERP responses in children become more adult-like as age and grammatical abilities increase.

References

- Friederici, A. D. (2005). Neurophysiological markers of early language acquisition: from syllables to sentences. *Trends in Cognitive Science*, 9(10), 481-488.

PRESENTATION 3:

Perceptual salience and the processing of subject-verb agreement in 8-11 year-old English-speaking children: Evidence from ERPs

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Approaches to how children process language are often formulated with reference to maturational (syntactic and neurological) limitations (e.g., Friederici, 2006). However, there is also some evidence suggesting that perceptual salience associated with phonological/prosodic factors influences the on-line processing of grammatical information (e.g., Sundara, Demuth, & Kuhl, 2011). This suggests that children might show different types of neural responses to different types of grammatical violations. In particular, children might show different neural signatures to errors of grammatical omission (e.g., *the girl cook) compared to errors of commission (e.g., *the girls cooks) due to the perceptual salience of the error. The current study is the first to explore whether factors such as perceptual salience influence 8-11-year-old English-speaking children's sensitivity to morphosyntactic violations involving the 3rd person-singular -s agreement.

Critically, this was carried out using an auditory processing procedure, rather than using visual (reading) modality.

We asked 24 children to listen to sentences describing objects pictured on a screen, while simultaneously recording their electroencephalogram (EEG). Data was initially analysed using cluster-based permutation tests, followed by ANOVAs, with Grammaticality, Position and 9 defined scalp Regions of Interest (ROIs) as within-subject factors. Overall, children were sensitive to the agreement violations, as shown by an N400 effect. However, the amplitude of the N400 was more pronounced for errors of commission than errors of omission, suggesting that children's sensitivity to agreement violation was modulated by relative perceptual salience due to the overtness of the violation. These results allow us to show that maturational constraints interact with the perceptual salience of grammatical morphemes during sentence processing, in children. Thus, findings of this study have great theoretical and methodological implications for exploring the development of language processing in the brain.

References

Friederici, A. D. (2006). The neural basis of language development and its impairment. *Neuron*, 52(6), 941–952.

Sundara, M., Demuth, K., & Kuhl, P. K. (2011). Sentence-position effects on children's perception and production of English third person singular -s. *Journal of Speech, Language, and Hearing Research*, 54(1), 55–71.

PRESENTATION 4:

Children do not use subvocal prosody to process comma: Evidence from concurrent recording of eye movements and even-related potentials

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Accumulating ERP evidence suggests that readers rely on subvocal prosody (an 'internal voice') to parse commas during on-line processing (Drury, Baum, Valeriotte, & Steinhauer, 2016). However, it is

not known whether children process commas like adults. This is primarily due to the unsuitability of the experimental paradigm known as RSVP (rapid serial visual Presentation) a computer-controlled word-by-word paradigm typically used in adult studies. Compared to natural reading, RSVP imposes a heavier working memory load, and thus more processing difficulties since readers cannot regress to an earlier point in the text (Schotter, Tran, & Rayner, 2014).

As an alternative to RSVP, the current ERP study used a natural-reading paradigm to examine the processing of commas by 24 9-11-year-old children: We presented participants with 100 sentences containing temporarily ambiguous transitive/intransitive verbs (half containing comma violations) while co-registering their eye movements and brain responses. If children process commas like adults, we expect similar ERP effects reported by previous adult studies: a closure positive shift (CPS) to commas indicating a perception of commas as prosodic boundaries, and an N400-P600 effect reflecting processing difficulty elicited by comma violations. However, the results showed only an N400 effect to the intransitive verb and an N400 to the following noun, reflecting children's difficulties in processing intransitive structures per se.

The absence of the expected ERP effects raised the question of whether our participants were aware of the comma violations. An examination of their eye-tracking data showed that they did: Compared to correct sentences, children showed longer dwelling time at the violations and more regressions from violations to earlier parts of sentences. Taken together, the results demonstrate that children—unlike adults—do not rely on subvocal prosody to parse commas, even though they notice comma violations.

References

Drury, J. E., Baum, S. R., Valeriotte, H., & Steinhauer, K. (2016). Punctuation and implicit prosody in silent reading: An ERP study investigating English garden-path sentences. *Frontiers in psychology*, 7, 1375. Retrieved from <http://journal.frontiersin.org/article/10.3389/fpsyg.2016.01375>

Schotter, E. R., Tran, R., & Rayner, K. (2014). Don't believe what you read (only once): Comprehension is supported by regressions during reading. *Psychological science*, 25(6), 1218–1226.

DAY
3

WEDNESDAY, 19TH

14:00-16:00, ROOM D101

SYMPOSIUM

The importance of early experience for language development: the role of phonological working memory

CONVENER: Fred Genesee, McGill University, Canada, fred.genesee@mcgill.ca

In order to build complex language from perceptual input, children must have access to a powerful information processing system that can analyse, store and use information about the input. In this symposium, we propose that one of the most important parts of the underlying machinery used for this purpose is the linked set of cognitive and language processing components that comprise the child's developing working memory (WM). More specifically, we argue that delays in language input, impoverished input or enriched input relative to typically-developing monolingual children can alter the quality and capacity of children's PWM which, in turn, can affect their language learning. To examine this hypothesis, we explore how variations in the timing, quality and quantity of language input during the earliest stages of development are related to variations in phonological WM, and, in turn, language learning outcomes in groups of language learners who clearly differ with respect to these aspects of input. Presenters discuss results of research on: (1) children with delayed exposure to language – internationally-adopted (IA) children who have delayed exposure to the adoption language; (2) children who experience impoverished language input – congenitally deaf children born to non-signing parents; and (3) children with enriched early language input – simultaneous bilinguals and second language learners. The final speaker will review neuroimaging evidence from IA, bilingual/second language learners, and monolinguals collected during the performance of a working memory task. Between-group as well as within-group comparisons along with behavioral and neuroimaging data will be presented. Presentations by each speaker will be followed by a synthesis of the evidence and then a general discussion.

PRESENTATION 1:

Internationally-adopted children: a special case of delayed language input

Fred Genesee, McGill University, Canada fred.genesee@mcgill.ca

Internationally-adopted (IA) children are of interest in discussions of the effects of early language experiences because they experience delayed exposure to the adoption language and most also experience attrition of their first language (L1). Thus, the phonological representations laid down during the first months of life when they are exposed to their birth language differ from those in the language they will ultimately learn. The question thus arises as to how these early experiences influence the development of both PWM and language abilities in the adoption language.

This Presentation will begin with a brief overview of findings from research on IA children in general (Scott & Roberts, 2016). It will then review the results of studies that compared the language and verbal memory (including phonological working memory, PWM) abilities of IA children from China to non-adopted children matched on age, gender and, importantly, socio-economic status. Studies were carried out when the children were 4;2, 7;10 and 10;8 years of age, on average. The children were assessed using tests of language (receptive and expressive vocabulary, receptive grammar) and verbal memory (including short-term and working memory in verbal and non-verbal domains), along with control measures of socio-emotional development and non-verbal intelligence. In brief, while the IA children often scored within the typical range on language tests, they scored significantly lower on these tests in comparison to the control children, and the gap between the groups increased with age. The IA children also scored significantly lower on tests of short-term and working verbal memory but not on tests of non-verbal memory. Regression analyses at 10;8 years of age revealed that the most significant predictor of language test scores for the IA children was verbal short-term and working memory while age was the most significant predictor for the control children.

References

Scott, K. A., & Roberts, J. A. (2016). Language development during the preschool years. In F. Genesee, & A. Delcenserie (Eds.), *Starting Over – The language development of internationally-adopted children* (pp. 65-94). Trends in Language Acquisition Research series (TiLAR). Amsterdam: John Benjamins Publishing.

PRESENTATION 2:**The impact of input quality on early sign language development**

Gary Morgan, City University, London, U.K. G.Morgan@city.ac.uk

There is much debate about how input variation influences language development. Children who are exposed to signed languages from deaf parents are termed native signers but only 5 % of deaf children have deaf parents (DCDP). Sign acquisition in DCDPs shows parallels in onset, rate, and patterns of development compared to children learning spoken languages. The remaining 95% of signers are the children of hearing adults (DCHP) who do not know a sign language before their child is diagnosed deaf and, thus, provide input to their children that is not native-like. The majority of deaf children are therefore first exposed to sign after the first few years by non-native signers. By comparing these two groups it is possible to document the impact of quality of input on language development. It has been proposed in the wider literature that early language development is linked to the development of phonological working memory. Disturbances to this link (in this scenario from impoverished input) have been shown to have long-lasting impacts (Mayberry & Eichen, 1991).

The study explores the outcomes of differential quality of input in DCDP and DCHP children aged two to five years. Two sets of data in British Sign Language (BSL) were collected: an expressive BSL vocabulary measure and an adult-child conversation sample. The data were coded for phonological richness (number and variety of handshapes types) for all children and their parents. DCDPs had a more developed vocabulary and more phonological handshape types compared with the DCHP group. In conversations, deaf parents used more sign tokens and more phonological types than hearing parents. The results are discussed in terms of the effects of early input on subsequent language abilities and, in particular, on how early developmental disturbances in put might impact the child's developing working memory system.

References

Mayberry, R. I., & Eichen, E. B. (1991). The long-lasting advantage of learning sign language in childhood: another look at the critical period for language acquisition. *Journal of Memory and Language* 30, 486–512.

PRESENTATION 3:**Early language experience, verbal memory and later language outcomes in bilingual immigrant children**

Elma Blom, Utrecht University, The Netherlands
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Previous research using between-group designs shows that bilingualism affects verbal short-term (VSTM) and verbal working memory (VWM) differentially. Monolinguals outperform bilinguals on VSTM, in particular if the task is language-specific (de Abreu et al., 2013). On VWM, in contrast, bilinguals outperform monolinguals (Blom et al., 2014; Delcenserie & Genesee, 2016). Using a within-group design, we aimed to (1) identify individual differences in early language experiences that affect bilingual children's VSTM and VWM and (2) detect the effects of VSTM and VWM on bilingual children's later language outcomes.

Longitudinal data from 79 Turkish-Dutch and Moroccan-Dutch bilingual children were analyzed. A parental questionnaire provided information on language experience (e.g., age of acquisition, exposure to both languages) before age 4; VSTM and VWM at age 5-6 (Time 1) and 6-7 (Time 2) were assessed with a forward and backward digit span task, respectively; Dutch vocabulary, morphology and sentence repetition at age 7-8 (Time 3) were tested with standardized tests. No effects of early language experience emerged for time 1 VWM; however, children who started earlier and had longer exposure to Dutch at time 1 tended to score better on time 1 VSTM than children who started later/had shorter exposure. Longer and more exposure to Dutch before age 4 predicted better sentence repetition at time 3, also when current exposure was controlled. Time 1 VSTM did not predict time 3 language outcomes. Time 1 VWM predicted Time 3 sentence repetition, also when VSTM was controlled.

In conclusion, the observed effects of language experience on VSTM support previous findings based on bilingual-monolingual comparisons. No specific early language experiences emerged from our study that could explain bilingual children's VWM enhancement. Regarding the effects of VSTM and VWM, we conclude that in school-aged bilingual immigrant children, VWM is more strongly linked to later language outcomes than VSTM.

References

de Abreu, P. M. J. E., Baldassi, M., Puglisi, M. L., & Befi-Lopes, D. M. (2013). Cross-linguistic and cross-cultural effects on verbal working memory and vocabulary: Testing language-minority children with an immigrant background. *Journal*

of Speech, Language, and Hearing Research, 56, 630-642.

Blom, E., Küntay, A., Messer, M., Verhagen, J. & Leseman, P. (2014). The benefits of being bilingual: Working memory in bilingual Turkish-Dutch children. *Journal of Experimental Child Psychology*, 128, 105-119.

Delcenserie, A. & Genesee, F. (2016). The effects of age of acquisition on verbal memory in bilinguals. *International Journal of Bilingualism*, 1-17. DOI: 10.1177/1367006916639158.

PRESENTATION 4:

Internationally adopted and bilingual children: evidence from neuro-imaging

Lara Pierce, Boston Children's Hospital/Harvard Medical School, U.S.A. lara.pierce@childrens.harvard.edu

Differences in the timing of early language input appear to influence phonological working memory (PWM), however neural mechanisms underlying this phenomenon are unclear. This Presentation examines the neurocognitive consequences of delayed input in two groups – internationally adopted (IA) and bilingual children. Both IA and bilingual children experience delayed exposure to their second language (L2). While bilingual language learners retain their first language (L1), IA children discontinue their L1 at adoption. Comparing neural activation patterns in these groups to monolingual learners can show how delayed language exposure might influence PWM over time.

Three groups of 10-17 year old participants were scanned using functional magnetic resonance imaging (fMRI) while discriminating sounds that were phonemic in Chinese, but not French: 1) IA participants from China who discontinued Chinese before age 3 in favor of their adoption language – French, 2) Chinese-French bilinguals who heard Chinese from birth, began acquiring French at the same time as the adoptees, but retained both languages, and 3) French monolinguals who were never exposed to Chinese. Both IA and bilingual children activated left temporal brain regions that differed from the right temporal activation observed in French monolinguals indicating that both groups retained neural representations from their birth language, despite the fact that IA children had not heard nor used Chinese since adoption. Critically, this retention went on to influence L2 processing. During a PWM task using French pseudo-words, all groups activated regions typically involved in PWM. However, both Chinese-French bilinguals and IA participants acti-

vated left insula/inferior frontal gyrus more weakly than French monolinguals while additionally activating brain regions typically involved in attention and cognitive control processes. Together these studies suggest that children's earliest language experiences establish a foundation for how the brain processes language sounds, and in turn PWM, years later.



DAY
4

THURSDAY, 20TH

9:00-10:00, **GRAND AMPHI**

PLENARY TALK

Language disorders: What do they tell us about child language development?

Gina Conti-Ramsden

University of Manchester, U.K.

Over three decades of research on language disorders have yielded a wealth of thought-provoking evidence regarding the nature and developmental course of language learning in children. In this talk I will discuss how key findings in language disorders help us further specify processes involved in children's language learning as well as help us clarify the role of oral language in other academic and developmental processes.

SYMPOSIUM

Vocabulary delay in children receiving bilingual exposure? Measurement and identification considerations across different language pairs

CONVENER: Daniela Gatt, University of Malta, Malta, daniela.gatt@um.edu.mt

Suspensions of language delay often arise when young children lag behind their peers in vocabulary growth. Assessment of vocabulary skills is therefore clinically important as it identifies delayed language development and detects potential risk for long-standing impairment. When children's exposure is bilingual, their vocabularies contain words in both languages, necessitating a bilingual approach to assessment. However, research suggests that smaller vocabularies in children receiving bilingual exposure may not necessarily constitute a delay. This issue is further compounded by the limited availability of bilingual norms to help identify delays objectively.

This symposium addresses the ambiguity surrounding the diagnostic category of bilingual vocabulary delay by bringing together research on the vocabulary skills of children exposed to different language pairs. It documents the possibility that limited vocabulary skills may be an outcome of single-language measurement and of the amount of input received in that language, leading to a risk of over-identification. Further, it acknowledges that small bilingual vocabularies may signal true cases of language delay, warranting objective evaluation for accurate identification. Together, the four studies attempt to pull apart the issues surrounding the diagnosis of language delay in the context of bilingual exposure. All investigations employed language adaptations of the MacArthur-Bates Communicative Development Inventories (CDI) vocabulary checklists (Fenson et al., 2007) to measure vocabulary. The first two Presentations address the possibility of over-identification in children exposed to Italian and an additional language, and to Basque and Spanish. The third Presentation considers the limited availability of bilingual vocabulary norms in children exposed to Maltese and English, while the fourth addresses the developmental progression of

Polish-English bilinguals' vocabulary skills, tracking the performance of lower-performing children over time. The symposium thus attempts to underscore the importance of careful measurement of children's bilingual vocabulary skills alongside consideration of other variables for accuracy in the identification of delay.

References

Fenson, L., Marchman, V. A., Thal, D. J., Dale, P. S., Reznick, J. S. and Bates, E. (2007). *The MacArthur-Bates Communicative Development Inventories* (2nd ed.). Baltimore: Brookes

PRESENTATION 1:

Measuring lexical skills in bilingual toddlers: linguistic input, total conceptual vocabulary and translation equivalents

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We report on the analysis of monolingual vocabulary sizes (MVS) and Total Conceptual Vocabulary (TCV) in toddlers exposed to different language pairs. We focus on the relationship between TCV size and translation equivalents and on the relationship between lexicon and early grammar within each language and across languages, taking into account the amount of input received in each language.

Parents of 26 toddlers (18-36 months of age) exposed from birth to Italian and to another language (Spanish, Romanian, Arabic, English, French and German) filled in the Word and Sentences Forms of the MacArthur-Bates CDI, in Italian and in the other language the child was exposed to (<http://mb-cdi.stanford.edu>). A semi-structured interview was administered to parents to estimate the percentage of exposure to each language.

Mean Italian MVS (275 words) was significantly larger than mean MVS in the other language (OL) children were exposed to (170 words) ($t(25)=3.173$; $p<.01$). Controlling for age, the percentage of exposure to Italian (64%) was positively correlated with Italian MVS ($Rho(23)=.41$; $p<.05$). Mean TCV size was significantly larger (362 words) than both MVSs ($t(25)=5.441$; $p<.01$ and $t(25)=8.200$; $p<.01$; for Italian and OL respectively). The percentage of translation equivalents significantly increased with increasing

TCV size ($F(1,24)=19.913$; $p<.001$; $r=.67$; adjusted $R^2=.43$). Looking at the percentile (on Italian norms) achieved by children, five children were below the 5th percentile based on the Italian MVS. Three of them resulted in an upper percentile when TCV was considered while the remaining two still remained below the 5th percentile. Lexical and grammar skills were significantly correlated within languages but not across languages.

Our results confirm that single language measures could under-estimate bilingual children's lexical and conceptual knowledge, resulting in a higher possibility of over-identification of language delay. The percentage of translation equivalents increased with increasing TCV size, confirming previous research findings.

PRESENTATION 2:

Can language delay and low amount of exposure to a language in early bilingualism be disentangled? The case of early Basque-Spanish bilinguals

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We investigate the relationship between input and expressive vocabulary in Basque, a minority language in continuous contact with Spanish. First, we analyze the vocabulary size and the amount of exposure of 975 toddlers (16-30 months). Second, we compare the vocabulary size of 40 Basque-Spanish bilingual toddlers in their two languages, and then with normative data, in order to answer the following question:

Do bilingual children have a higher probability of being children "at risk of language delay"... in their two languages?

For each child, the number of expressive vocabulary items and the amount of exposure to the languages were obtained, using the Basque and the Spanish CDI instruments:

Basque CDI (N = 975 monolinguals and bilinguals)

Basque and Spanish CDI (N = 40 bilinguals)

Participants were divided in three groups according to their *expressive vocabulary* and *relative input*.

Three groups were distinguished for vocabulary size: very large (VL), regular, and very small (VS) vocabulary size, corresponding to the P(ercentiles) $P>90$, $P11-90$ and $P<10$ in each age group. Next, four input groups were distinguished based on children's *relative input*: over 90%, 60-90%, 40-60% and <40% Basque input.

1) Basque normative data revealed that VS (or at risk) children rates increase inversely to input rates (10% VS among children" with >90% input vs. 30% VS in <60% input groups).

2) The smaller vocabulary sizes found in the bilinguals when compared to normative data in both their languages contrasts with a similar conceptual vocabulary size in monolinguals and bilinguals (Pearson et al., 1997).

The risk of obtaining false positives is high among bilinguals with low exposure to the tested language. Therefore, relative input cannot be disregarded when diagnosing bilinguals.

References

Pearson, B.Z., Fernández, S., Lewedeg, V. & Oller, D.K. (1997). The relation of input factors to lexical learning by bilingual infants. *Applied Psycholinguistics*, 18, 41-58.

PRESENTATION 3:

Identifying delayed bilingual development in Maltese children: what do we know and what do we need to know?

Daniela Gatt, University of Malta, Malta daniela.gatt@um.edu.mt

Maltese children grow up in a bilingual context where Maltese and English are majority languages. For most children, exposure is predominantly Maltese, with English input being largely fragmented. Documentation of early expressive vocabulary skills in the context of this specific input combination is limited. This Presentation synthesizes the more important findings reported for children receiving Maltese-dominant exposure, with the aim of deriving implications for the early identification of language delay in this population.

Three cross-sectional studies, two based on Maltese children and one comparing early bilingual vocabularies across different language pairs, are considered. Maltese participants in the first and second study were aged 12-30 months ($N = 44$) and 23-34 months ($N = 65$) respectively. The larger cross-linguistic cohort ($N = 250$) was aged 24-36 months. All studies employed adaptations of the

CDI: Words and Sentences vocabulary checklist to measure children's expressive vocabularies.

The first study showed minimum composite vocabulary scores to closely approximate Fenson et al.'s (1993) CDI 10th percentile scores. Results from the second study revealed vast differences in individual pairs of single-language vocabulary scores, despite general uniformity being reported in the participants' language exposure. In the cross-linguistic study, Maltese participants' composite vocabulary scores were relatively lower than those of children exposed to other language pairs. A cross-linguistic 10th percentile threshold showed 38.46% of lower-performing participants to be Maltese. Common to all studies was the immense variability in participants' composite and single-language vocabulary scores.

The cross-linguistic clinical threshold is a useful starting point for identifying potential delays in children receiving bilingual exposure. However, Maltese children's relatively lower performance warrants additional consideration. Together, findings point towards the need for further vocabulary data that elaborate on Maltese children's group-level performance and individual-level classification accuracy, so that language delay may be identified with more confidence.

References

Fenson, L., Dale, P. S., Reznick, J. S., Thal, D., Bates, E., Hartung, J. P., Pethick, S. J. and Reilly, J. S. (1993) *The MacArthur Communicative Development Inventories*. San Diego, CA: Singular.

PRESENTATION 4:

Does CDI performance predict later vocabulary skills in Polish-English bilingual children?

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In this Presentation, we report on the longitudinal analysis of vocabulary development in Polish-English bilingual children living in the U.K. and Ireland. We assess continuity in lexical development by comparing initial performance on the MacArthur-Bates CDI: Words and Sentences with participants' later vocabulary scores and employ both measures in order to identify potential persistent language delay.

Participants' (N=25, 8 girls, 17 boys) early lexical production in Polish and English was assessed at the age of 24-36 months with Polish and English CDI adaptations (English: Meints & Fletcher, 2001; Polish: Smoczyńska, 1999). In the follow-up study, we assessed the same children's receptive and expressive vocabularies when they reached school entrance age (mean age: 6,4 years, range: 5,5-7,1). This assessment was administered in both Polish and English using Crosslinguistic Lexical Tasks (CLTs), which have been created to yield directly comparable results across languages. Information on risk factors and language exposure variables was gathered from a specially designed developmental and language background questionnaire.

Preliminary results demonstrate that children who produced less than 50 words on the CDIs at the first testing point (which may indicate 'late talking') (N=8) did not score significantly lower on the production sub-tests of the CLTs than a sub-group without a history of late talking ($p > .05$).

CDI scores did not predict later vocabulary performance in Polish-English bilingual children, hence the contribution of other variables to this outcome needs to be considered. Therefore we analyse the relation between language input and output in both languages at the first and second testing point and lexical development of the participants. We discuss the role of language exposure, socioeconomic status and risk factors for language development in closing the vocabulary gap between the sub-groups with and without a history of late talking.

References

Meints, K. and Fletcher, K. (2001). *Toddler Communicative Development Inventory*, a UK adaptation of the MacArthur-Bates Toddler Communicative Development Inventories. University of Lincoln Babylab. See <http://www.lincoln.ac.uk/home/media/universityoflincoln/schoolofpsychology/CDItdler.pdf> (accessed 25 January 2011).

Smoczyńska, M. (1999). *Inwentarz rozwoju mowy i komunikacji: Słowa i zdania*, Polish adaptation of the MacArthur-Bates Communicative Development Inventories: Words and Sentences. Unpublished material. Jagiellonian University, Krakow.

SYMPOSIUM

Learning in SLI: from a neurocognitive and linguistic perspective

CONVENER: Annette Scheper, Royal Dutch Kentalis Academy; Behavioural Science Institute BSI, Radboud University, The Netherlands, a.scheper@kentalis.nl.

Basic neurocognitive systems influence language development in children. Statistical learning of complex rules or patterns play an important role in learning language (Ullman & Pierpont, 2005; Obeid, Brooks, Powers, Gillespie-Lynch & Lum, 2016). Disordered language development could stem from an aberration in the neural network underlying procedural memory. The Procedural Deficit Hypothesis (PDH) predicts impairments of procedural memory itself, and that such impairments underlie the linguistic or grammatical deficits in SLI. Also non-linguistic impairments in neurocognition, such as sustained attention or executive functioning, are involved in learning in SLI (Pauls & Archibald, 2016).

Neurodevelopmental disorders such as Specific Language Impairment (SLI) also show strong genetic influence. There is substantial overlap at the phenotypic level and at the genotypic level on SLI. New genetic techniques contribute to understand the pathways from genes to brain systems and language. The challenge is to discover specific genes that influence basic neurocognitive systems that result in impaired language.

This symposium will discuss the results of four studies examining learning from different perspectives in Dutch SLI. From a neurocognitive point of view, evidence of impairments in procedural learning in children with SLI is shown. The linguistic and neurocognitive profile of patients with mutations in particular genes will be presented. Also the results of an executive function training in children with SLI is discussed. From a linguistic point of view, the longitudinal results of intervention and its contribution to develop narrative and executive function skills in SLI is shown.

References

Pauls, L.J. & Archibald, L.M.D. (2016). Executive Functions in Children With Specific Language Impairment: A Meta-Analysis, *Journal of Speech, Language, and Hearing Research*, 15, 0174.

Obeid, R., Brooks, P.J., Powers, K.L., Gillespie-Lynch, K. & Lum, J.A.G. (2016). Statistical Learning in Specific Language Impairment and Autism Spectrum Disorder: A Meta-Analysis, *Frontiers in Psychology*, 7, 1245.

Ullman, M.T., & Pierpont, E.I. (2005). Specific language impairment is not specific to language: The Procedural Deficit Hypothesis. *Cortex*, 41(3), 399-433.

PRESENTATION 1:

Genomics of speech and language disorders: the next generation

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Specific language impairment (SLI) can have a major impact on communication skills and development in children, and often persists later in life. In contrast to other neurodevelopmental disorders, the genetic background of SLI and other speech and language disorders is poorly understood. So far, FOXP2 is the only well-characterized gene implicated in speech and language disorders. Other candidate genes have started to emerge, but the exact speech and language phenotypes associated with gene disruptions are often incomplete, and the crucial molecular mechanisms remain elusive.

In this research project, we aim to identify new candidate genes for speech and language disorders by performing whole exome sequencing on a

well-characterized cohort of 50 children with severe speech and language disorders, against completely normal family histories. A trio approach, which means that the DNA of the child is compared with the parents' DNA, is used to detect de novo (new) mutations. We also aim to characterize the impact of gene disruptions on speech and language development. To achieve this, careful phenotyping is performed in a cohort of 30 patients with mutations in genes that have previously or newly been associated with neurodevelopmental disorders with severe speech and language problems. Extensive linguistic and neuropsychological testing is performed for children in this cohort with mutations in the same gene, to explore the speech/language and neurocognitive profiles associated with specific gene disruptions. In this Presentation the linguistic and neuropsychological profiles of patients with mutations in known (e.g. SATB2) and novel genes will be discussed. In addition to the clinical characterization of patients with DNA mutations in candidate genes, functional assays in a molecular genetics laboratory are being performed to assess the impact of the variants in these genes on protein function, and to define and expand molecular networks in the brain relevant to speech and language.

PRESENTATION 2:

Implicit learning in Specific Language Impairment

Constance Vissers, Royal Dutch Kentalis Academy; Behavioural Science Institute, Radboud University, Nijmegen, The Netherlands c.vissers@kentalis.nl/ **Fenny Zwart**, Donders Institute for Brain, Cognition and Behaviour, Centre for Cognition, Radboud University Nijmegen, The Netherlands f.zwart@donders.ru.nl

Specific Language Impairment (SLI) is a developmental disorder characterized by impaired language skills (American Psychiatric Association, 2000). Language is thought to develop largely through implicit learning mechanisms, which refers to an 'automatic' way of learning. This contrasts the more effortful, explicit learning that we for example use as adults to learn a second language. It has been hypothesized that implicit learning deficits underlie linguistic abnormalities in SLI. Indeed, most scientific studies show that children with SLI show poor performance on implicit learning tasks, although there are some inconsistencies (for a recent meta-analysis, see Lum, Conti-Ramsden, Morgan & Ullman, 2014). The memory system that underlies implicit learning is called 'procedural memory', which literally means memory of procedures, such as skills or any other sequence of events. Recently, some authors have suggested that language difficulties in SLI, in particular grammar deficits, stem from a deficit in this procedural memory system,

and that this deficit is linked to abnormal functioning of the frontal-basal ganglia circuits (Ullman & Pierpont, 2005). Some authors suggest that the declarative or explicit memory system compensates for the deficit in procedural memory in SLI (Lum et al., 2014). This would mean that a child with SLI will not pick up grammar automatically, like other children do, but rather has to explicitly learn grammar. In our recent study, we compared three groups of school aged children: children with SLI (n = 20), children with autism (n = 20) and typically developing children (n = 20). Findings show that children with SLI indeed show impairments on a procedural learning task. Furthermore, EEG data show that the neurobiological processes underlying this procedural learning are also altered. For interventions, this implies that tapping into the intact declarative system might be helpful in overcoming the problems with the automatic, or procedural, system.

References

American Psychiatric Association. (2000). Diagnostic and statistical manual of mental disorders: DSM-IV-TR (4th ed.). Washington, DC: American Psychiatric Association.

Lum, J. A., Conti-Ramsden, G., Morgan, A. T., & Ullman, M. T. (2014). Procedural learning deficits in specific language impairment (SLI): A meta-analysis of serial reaction time task performance. *Cortex*, 51, 1-10.

Ullman, M. T., & Pierpont, E. I. (2005). Specific language impairment is not specific to language: The procedural deficit hypothesis. *Cortex*, 41(3), 399-433.

PRESENTATION 3:

Executive Function training in Specific Language Impairment

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Growing evidence suggests that executive functions (EFs) are in some way involved in the problems associated with specific language impairment (SLI). Several studies reported limitations in EFs in children with SLI (Henry et al., 2011). EF training has proven to be a promising intervention in other groups of children characterized by impairments in

EF (Melby-Lervag & Hulme, 2012). This raises the question whether training of EF might be a meaningful intervention for these children. To date, however, research describing interventions directed at improving EF in children with SLI is very limited. The present study, therefore, explores the effect of EF training in children with SLI. The intervention is the EF training “Braingame Brian”. In this training three EF (visuospatial WM, inhibition and cognitive flexibility) are trained, embedded in a game like environment (Prins et al., 2013). Ten children with SLI, ages 8 to 12 years, completed a 25-session training of visuospatial working memory, inhibition and cognitive flexibility over a 6-week period. Treatment outcome was examined directly after training and at 6 months follow-up by tasks of the three trained EF, tasks of untrained neurocognitive functions (attention, planning and fluency), and ratings of EF and behavioral problems by parents and teachers. Directly after training, results showed significant improvement on cognitive flexibility and a positive trend for visuospatial storage and inhibition. At 6 months follow-up, the children performed significantly better on tasks of all three trained EFs. Furthermore, the results showed significant improvement on sustained attention, attention control, parent- and teacher-rated attention behaviour and parent-rated EF and externalizing behaviour with medium effect sizes. These results highlight the importance of a large-scale, randomized controlled trial examining the possible effects of EF training in children with SLI. First results of this RCT study will be presented.

References

Henry, L. A., Messer, D. J., & Nash, G. (2011). Executive functioning in children with specific language impairment. *Journal of Child Psychology and Psychiatry*, 53(1), 37–45.

Melby-Lervåg, M., & Hulme, C. (2012). Is working memory training effective? A meta-analytic review. *Developmental Psychology*, 29, 270–291.

Prins, P.J.M., Ten Brink, E.L., DAVIS, S., Ponsioen, A.J.G.B., Geurts, H.M., de Groot, H., de Vries, M. & Van der Oord, S. (2013). Braingame Brian: Toward an Executive Function Training Program with game-elements for children with ADHD and cognitive control problems. *Games for Health Journal*, 2, 44–49.

PRESENTATION 4:

Efficacy of intervention in SLI: interaction between narrative and executive functioning

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It is well-known that children with specific language impairment (SLI) have impaired narrative abilities. There is growing evidence that the problems associated with SLI are not limited to language. Executive functions (EFs) are also to be involved in these problems (e.g. Henry et al., 2012, Boelhouwer, Scheper, Cuperus & Verhoeven, to be published).

To date, there is still need for interventions for children with SLI to enhance their narrative ability. The present study, explores the effect of a multidisciplinary intervention in children with SLI. The aim of this study was to evaluate the efficacy of an intervention in which language ability is trained by speech and language therapists, alongside a neuropsychologist who trains EF skills. Sixty-one children with SLI of nine, ten, and eleven years of age, received eight weeks of multidisciplinary treatment by speech and language therapists and a neuropsychologist, adjusted to the children’s personal weak and strong skills. Narrative ability and EF skills were tested beforehand (T1) and approximately six months after treatment (T2). At six-month follow-up, children performed significantly better on narrative measures. Moreover, children showed improved visual short-term memory and cognitive flexibility. Scores for verbal short-term memory and (complex) sustained attention did not differ between T1 and T2. This study shows that children with SLI can benefit from multidisciplinary treatment that taps into their language ability as well as their EF skills.

References

Henry, L.A., Messer, D.J. & Nash, G., (2012). Executive functioning in children with specific language impairment, *Journal of Child Psychology and Psychiatry*, 53, 37–45.

Boelhouwer, W., Scheper, A.R., Cuperus, J. & Verhoeven, L. (to be published). The role of executive functioning in narrative construction in children with specific language impairment, *International Journal of Language and Communication Disorders*.

DAY
4

THURSDAY, 20TH

10:30-12:30,

AMPHI LUCIE AUBRAC

SYMPOSIUM

The long and winding road to text quality: Cross-linguistic aspects of the developmental trajectory of text writing

CONVENER: Anat Stavans, Beit Berl College, Israel, stavansa@beitberl.ac.il

The ultimate goal of learning to write is proficient text production. Research in writing have been dedicated at determining which text features are the best indicators of proficient writing and what knowledge and skills of writers would best explain variability in mastering the qualities of good text writing. While certain features of writing quality are genre – dependent, others are valid indicators across genres e.g., logical connectives might be indicators of expository text quality while temporal connectives are better indicators of narrative quality. Moreover, the knowledge and skills that purportedly underpin writing quality are age/schooling dependent e.g., notational abilities have been found to explain writing quality in the first years of schooling while planning is crucial to the writing quality of older children. Both text-features and writers' skills are language and orthography dependent. While some languages favor the use of complex syntax in the form of subordination other languages favor coordination or juxtaposition and differences in orthographic consistency explain the different contribution of spelling in the writing quality of young writers.

The proposed symposium advances several features at a micro and macro text level – from number of words and spelling accuracy, through lexical sophistication, use of connectives and complex morphosyntax up to text structure – as predictors of quality in summary and full expository (and narrative) text writing. Studies in different languages and orthographic systems – Catalan, English, Hebrew, and Spanish – examine the contribution of cognitive, linguistic, discursive, notational, planning and reading skills to explain variability at different school levels. Comparison across ages and languages would be instrumental to detect developmental trends, to tease out general and language specific factors that explain writing success and to draw pedagogical implications.

PRESENTATION 1:

The relative contribution of oral and written abilities to the writing quality of Spanish speakers in the first years of primary school

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In Spanish children learn to spell words shortly after formal instruction begins but text production is a protracted and many times a poor and painful achievement. Research emphasizes that automatizing transcription skills is crucial for attaining text quality since inefficient transcription interferes with high-level writing processes. The goal of the study is to determine whether children's linguistic discursive abilities or rather their transcriptional efficiency explain the quality of their written productions.

Participants were native Spanish speakers, 152 from first grade (M= 74 months) and 154 from third grade (M= 99 months). For assessing oral linguistic discursive abilities, children dictated a description of their favorite hero to an adult that acted as a scribe. Written discursive abilities were gauged in three descriptive texts children produced in response to a writing prompt. Writing quality was established by researcher-based and external analytical evaluations. Both for writing and for dictation children had to produce monological and self-sustained descriptive texts but in dictation they were free from the demands of transcription. Oral and written texts were coded for: productivity (number of words and clauses), lexical richness, text-structure, syntactic density and complexity.

At Grade 1 dictated texts outperformed written texts in productivity but neither in text-structure or in syntactic density or complexity. In Grade 3 written texts were better than dictated texts in every measure except for lexical richness. At similar production demands the written modality enabled a better performance. Moreover, performance in the dictated texts did not account for writing quality. The generation of a text does not consist of a transcription of discursive abilities young writers have at their disposal but are unable to express due to the demands imposed by the mechanics of writing. The competencies necessary to compose a good-quality text have a protracted developmental route that does not depend on automatization of the mechanics of writing.

PRESENTATION 2:**The relative contribution of cognitive, linguistic and reading abilities to the writing quality of expository text structure in young Hebrew speaking school children**

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Learning to write is a process that integrates multiple individual skills and contextual factors. This Presentation is part of a large scale study that aimed at tracing a developmental model of writing, focussing on the relative contribution of individual abilities to the quality of written expository texts, which are at the core of the development of academic literacy at school.

Participants were 160 elementary school children in 2nd, 3rd, 4th and 5th grades in three schools in central Israel. The participants completed a set of written and oral tasks related to explanatory variables of text quality (e.g. notational and discourse abilities, vocabulary, reading comprehension, working memory and handwriting fluency). Each child produced four texts (two informatives and two argumentatives) in different modes of production (pen and paper, using a Smartpen or dictating to the experimenter). The texts were analyzed in terms of length and text structure.

The results show significant differences in the length of expository texts in terms of text type (informative or argumentative) and mode of production. The findings indicate that age and cognitive, linguistic and reading tasks improve with age and these correlate with longer texts consisting of better canonic text components (introduction, body and end) and with more genre-specific components (e.g. presence of (counter) claim/support in the case of argumentative texts). Longer texts and the mode of their production correlate with cognitive ability mostly in argumentative texts (e.g., greater cognitive abilities relate to longer argumentative texts); while reading abilities correlate mostly with pen and paper production of both informative and argumentative texts.

To conclude, our findings indicate that expository text quality (argumentative more demanding than informative) produced by the child's writing (pen and paper and smartpen as opposed to dictation) is affected by cognitive abilities, linguistic knowledge, and reading ability. These findings have pedagogical implications regarding the emphasis needed in facilitating the mastery of quality of expository text writing.

PRESENTATION 3:**What do young children do when they are asked to plan to write a text?**

Anna Llaurado, University College London, U.K. anna_llaurado@yahoo.es / **Julie Dockrell**, University College London, U.K. j.dockrell@ucl.ac.uk

Planning is a key component in the production of a coherent written text. Plans serve a number of functions including idea generation and organisation of the text. The structure of plans contributes to text quality in older children. Younger writers, however, struggle with planning and, at this point in development; plans do not contribute to text quality. In this study we examined the structure and content of the spontaneous plans produced children of ages 6 to 12. Given that the act of planning is underpinned by oral language skills, we also examined the contribution of linguistic measures to written text quality.

The participants, 210 English and Catalan speakers produced 2 descriptive texts when they were in grades 1, 3 and 5 and again in grades 2, 4 and 6. On each occasion children were asked to generate a plan before writing their texts. They had 5 minutes to note down anything they thought would help them write a good text. Plans were scored for both content and structure.

The findings show that a large proportion of both English and Catalan children in grades 1 to 4 engaged in planning by producing a first draft, suggesting an early lack of understanding of what a plan is. Over time there was evidence that children produced more sophisticated plans where initially content was represented and later more complex structure and abstract content. Within the same genre, English children were more consistent in their approach. In both languages, hierarchically structured plans, which content referred to structure, and written and oral language measures were related to higher scores for features of text quality.

The distinction between planning for structure and planning for idea generation is discussed and the implications for pedagogy considered.

PRESENTATION 4:**Academic Language Proficiency predicts early adolescents' Writing Quality**

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The language demands of academic writing remain underexplored; however, scholars hypothesize that a common set of school-relevant language skills underlie proficient text comprehension and production (Bailey, 2007). To begin to test this hypothesis, we examined the contribution of receptive academic language skills to explain variability in early adolescents' quality of written expository summaries. We adopt the Core Academic Language Skills (CALs) construct as our operational definition. CALs refer to a constellation of high-utility language skills that correspond to linguistic features prevalent in academic discourse across school content areas and infrequent in colloquial conversations (e.g., skill in tracking referential chains, logical connectives, complex morphosyntax).

A cross-sectional sample of 178 4th-8th graders balanced by grade, gender, and socioeconomic status participated in this study. At the start and end of the school year, participants were administered: CALs-Instrument (CALs-I), theoretically and psychometrically robust assessment of early adolescents' CALs; a standardized reading comprehension test; a task that elicited written summaries of expository texts.

The reading comprehension test and the summaries were based on the same source texts. Summaries were scored for quality using a holistic rubric (by teachers blind to the study questions) and analyzed for linguistic features through automated tools. Regression analyses revealed that CALs predicted summary quality, controlling for student characteristics (baseline CALs, reading comprehension of source texts, socio-demographic characteristics) and text features (summaries' length, lexical sophistication, stance markers). Findings suggest that the tested academic language skills have a robust positive relation with writing performance, predicting unique variance over learner and text characteristics. Results lend empirical support to a multi-modal construct of academic language proficiency and to pedagogical approaches that attend to language across reading and writing. Producing written summaries—a genre we frequently use to assess mastery of content and concept knowledge—poses linguistic demands that educators need to support during instruction.

PRESENTATION 5:**Linguistic features of early written products in a consistent and an inconsistent orthography**

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Learning to write requires performing a thorough linguistic analysis. During this process children will discover the properties of written language and the nature of their link to oral language at each level of rePresentation, from phonology and morphology to discourse. Writing and speaking maintain a relationship that is different in every language and that may be more or less complex. We present a systematic comparison of learning to write in two highly contrasting languages and orthographies: English and Spanish. Drawing from current theories of writing development, which posit that spelling heavily constrains early writing skills, we hypothesized that the more simple and consistent orthography of Spanish would result in an advantage in early written composition.

We followed the emerging text writing skills of 188 and 191 English and Spanish-speaking children, respectively, from mid Year-1 to mid Year-2. Testing took place three times in six-monthly intervals. We obtained text-based measures of accuracy in spelling, word segmentation and use of capitals; number of words, connectors, and adjectives; lexical density and diversity, and lexical sophistication. A subset of the sample was also scored on narrative quality.

Our results showed that Spanish children progressed more rapidly in spelling accuracy, word segmentation and capitalization, probably due to the higher consistency of the orthography. In contrast, both language groups showed similar achievement levels in most of the remaining measures, including text length and narrative quality.

Our accuracy findings are in line with a substantial body of research showing the more rapid developmental rate of the development of literacy for users of consistent orthographies. However, it appears that this facilitating effect is not transferred to other skills and levels, thus challenging current views on the role of spelling in early writing development. The psycholinguistic and educational implications will be discussed.

SYMPOSIUM

How do children build their early lexicon? Evidence from monolingual and bilingual toddlers.

CONVENER: Claire Delle Luche, University of Essex, U.K., c.delleluce@essex.ac.uk

Research on the adult lexicon has revealed its high level of interconnection, enabling access with phonological, orthographic or semantic information. In the case of the bilingual lexicon, it is generally assumed that both languages share the same highly interconnected network (e.g., Dijkstra, van Heuven & Walter, 2002).

Our understanding of the early lexicon in the developing child is however quite limited. Evidence from 18 month olds showed that associative relationships (e.g., between *dog* and *bone*) are established earlier and pave the way for taxonomic relationships (e.g., *dog* and *horse*, Arias-Trejo & Plunkett, 2013). In the bilingual child, research suggest that, like adults, the two languages are tightly interconnected (Singh, 2013).

We present here three studies that investigate aspects of lexical organisation. The first one was conducted with monolingual English toddlers, to evaluate whether they use collocation when learning new words. The two other studies explore specificities of the bilingual lexicon: does linguistic distance impact semantic relationships, and whether translation equivalent knowledge has an effect on lexical processing.

Altogether, these studies contribute to an increasing understanding of the early lexicon, revealing processes through which children build and access semantic information.

References

Arias-Trejo, N., & Plunkett, K. (2013). What's in a link: Associative and taxonomic priming effect in the infant lexicon. *Cognition*, 128, 214-227.

Dijkstra, T., & Van Heuven, W. J. B. (2002). Modeling bilingual word recognition. Past, present and future. *Bilingualism: Language and Cognition*, 5(3), 219-224.

Singh, L. (2013). One world, two languages: Cross-language semantic priming in bilingual toddlers. *Child Development*, 1-12.

PRESENTATION 1:

The building blocks of the early lexicon: Associative and taxonomic auditory priming in 15- and 18-month-olds

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Recent evidence suggests that 18-month-olds' lexicons contain semantic relations between spoken words: Delle Luche et al. (2014), using an all-auditory head-turning paradigm, showed that toddlers preferred to listen to lists of taxonomically related words rather than unrelated, indicating that infants compute the meaningful relationship between words in the absence of object referents. We follow up on these findings by investigating (1) the temporal dynamics of word-to-word activation and (2) the age of emergence of these relationships.

Exp1 used the same taxonomically-related lists as in Delle Luche et al., while Exp2 used lists of both taxonomically and associatively related words, but with longer ISIs. We predicted that the spreading activation amongst associatively related words would be longer lasting than amongst taxonomically related words (Krackow & Gordon 1998), leading to stronger priming effects in Exp2 than Exp1. Indeed, Exp1 showed no effect, whereas in Exp2 results showed a preference for related lists. This indicates that the temporal dynamics of semantic priming is longer lasting for associatively related words than for taxonomically related words, suggesting that associative priming might emerge earlier than taxonomic priming.

To test this, 15-month-olds were presented with either taxonomically-related words (Exp3) or associatively-related words (Exp4) in a similar task. Because of the small lexicon at this age, we used the same paradigm as Willits et al. (2013) in which lists were made of two words either related (e.g. taxonomically: horse/dog; associatively: car/door) or unrelated. We selected words based on a corpus analysis in CHILDES to verify that they were associatively related in child-directed speech. Results of Exp3 showed no effect whereas Exp4 showed a significant preference for associative over unrelated lists.

Overall, these experiments strongly point towards an associative basis for the structure of the early lexicon, from which later taxonomic links might derive (Nelson, 1985).

PRESENTATION 2:

The organisation of the bilingual lexicon: the impact of linguistic distance on semantic activation

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Priming studies in monolingual children showed that, from the age of 21 months, an activation for semantically related words (*cat* primes *dog*) and an inhibition for unrelated words (*duck* inhibits *bow*, see Arias-Trejo and Plunkett, 2009). With bilingual children, little is known about semantic activation. A study on English-Mandarin toddlers indicated interconnectedness in the bilingual lexicon (Singh, 2013).

In this study, we used a cross-modal priming paradigm with 24-to-27-month-old bilinguals in English (N=37); a group of monolingual children served as control (N=60). Related or unrelated prime words were presented in a carrier sentence. For the monolingual group, semantic activation is observed for related words, and semantic inhibition for unrelated words. For the bilingual group, however, no semantic effect was observed: children looked at the target regardless of the prime.

Adding linguistic distance, as measured by Chiswick and Miller (2005), as a covariate, analyses revealed that children learning two distant languages such as English and Mandarin behaved similarly to monolinguals, but those learning two close languages like English and Dutch did not as they looked at the target regardless of the semantic link.

These results suggest that the organisation of the bilingual lexicon may be more complex, and that linguistic distance shapes the lexicon differently.

References

Arias-Trejo, N., & Plunkett, K. (2009). Lexical-semantic priming effects during infancy. *Philosophical Transactions of the Royal Society*, 364, 3633-3647.

Chiswick, R., & Miller, P. W. (2005). Linguistic distance: A quantitative measure of the distance between English and other languages. *Journal of Multilingual and Multicultural Development*, 26(1), 1-11.

Singh, L. (2013). One world, two languages: Cross-language semantic priming in bilingual toddlers. *Child Development*, 1-12.

PRESENTATION 3:

Translation facilitation effects in very young bilinguals

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The present study investigated the impact of translation equivalents (TE) on lexical processing in a sample of 22-month-old French-English bilingual toddlers. Children completed the Computerized Comprehension Task (CCT; Friend & Keplinger, 2003) and parents were asked to complete the MacArthur Bates Communicative Development Inventory (CDI) in both English and French. Correct trials on the CCT were identified and classified into one of two categories: words with a known TE as reported on the CDI and words without a known TE on the CDI. Reaction times for correct trials were then averaged in each category and compared for each of the bilinguals' languages. Interestingly, children were faster to retrieve words with a known TE on the CDI than words with no known TE. The present findings suggest that the translation facilitation effects reported in adult bilinguals are also present in very young bilinguals.

References

Friend, M., & Keplinger, M. (2003). An infant-based assessment of early lexicon acquisition. *Behavior Research Methods Instruments & Computers*, 35(2), 302-309.

SYMPOSIUM

Processes underlying children's reference production

CONVENER: Catherine Davies, University of Leeds, U.K., c.n.davies@leeds.ac.uk

DISCUSSANT: Petra Hendriks, University of Groningen, The Netherlands, P.Hendriks@rug.nl

Psycholinguistic approaches to reference are concerned with the mechanisms through which people understand and produce referring expressions; moment-by-moment, and how these mechanisms relate to other aspects of cognition. Since Trueswell et al. (2009), much has been learned about how reference comprehension mechanisms develop. In contrast, our knowledge of children's reference production processes has not matched this pace. Furthermore, although we have an established research tradition looking at online processes in adult reference production and how they relate to other cognitive processes (e.g. Brown-Schmidt & Tanenhaus, 2006), work on comparable processes in children is relatively scant.

Thanks to advances in methods such as the visual world paradigm, carefully-designed referential communication tasks, and analyses of spontaneous interactions, we can now study children's reference production processes in relatively naturalistic situations. In this symposium, we review how these methods have yielded important discoveries about the development of reference production, e.g. the relationship between children's visual scanning behaviour and the form of their referring expressions, the use of social common ground by children with ASD, and the cognitive interplay between syntax and discourse-pragmatics.

The symposium will explore how recent work in children's reference production interfaces with a range of important theoretical concerns. We will discuss how our research findings can inform wider theories of speech production across the lifespan, theories on the interplay of children's production mechanisms and their wider cognitive abilities, and theories on the integration of discourse-pragmatics with other sources of linguistic information.

The overarching goal of our symposium is to re-

focus attention from the processes underpinning children's comprehension to those underlying their reference production. By bringing together a range of approaches and techniques for studying the development of reference production, we sketch out research priorities for the field.

References

Brown-Schmidt, S. & Tanenhaus, M.K. (2006). Watching the eyes when talking about size: An investigation of message formulation and utterance planning. *Journal of Memory and Language*, 54, 592-609.

Trueswell, J.C., Sekerina, I., Hill, N.M. & Logrip, M.L. (1999). The kindergarten-path effect: studying on-line sentence processing in young children. *Cognition*, 73, 89-134.

PRESENTATION 1:

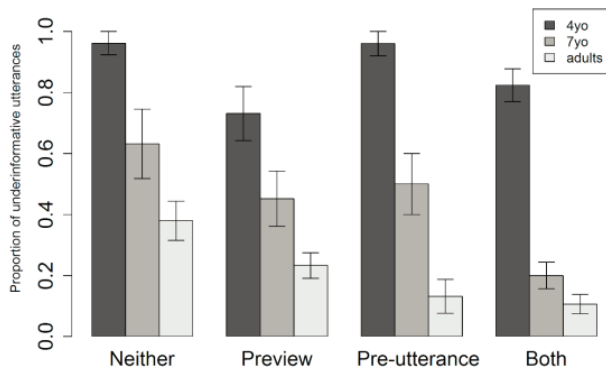
Is children's referential informativeness driven by their visual scanning behaviour?

Catherine Davies, University of Leeds, U.K. c.n.davies@leeds.ac.uk / Helene Kreysa, Friedrich-Schiller-Universität, Jena, Germany helene.kreysa@uni-jena.de

This study examines the relationship between children's eye movements during speech planning and the form of their referring expressions. It suggests developmental differences in the way children integrate information from visual scenes into their referential choices.

Referring expressions can be minimally informative (e.g. 'the small apple' to refer to one of a pair of apples contrasting in size) or underinformative ('the apple' in the same situation). Children mature through a stage of frequent underinformativeness on their way to becoming fully informative speakers (Matthews, Lieven & Tomasello, 2007). It has been suggested that children only provide fully informative descriptions once they have developed the resources to engage in comparison activity and to incorporate the resulting modifiers into their expressions (Whitehurst, 1976). Because informative reference first requires speakers to notice contrasting objects, we investigated incomplete visual scanning as a potential cause of underinformativeness.

4-year-olds ($n = 27$), 7-year-olds ($n = 30$), and an adult comparison group ($n = 24$) played a referential communication game in which they individually directed an addressee to click on a target object. The younger children frequently underinformed ($M = 83\%$ of their referring expressions, $SD = 25$), whilst their older peers did so less frequently ($M = 37\%$, $SD = 25$; adults $M = 19\%$, $SD = 21$).



The figure shows mean proportions of underinformative trials following contrast fixation patterns across preview and pre-utterance temporal regions. Generalised linear mixed effects models revealed that fixating a contrast object before speaking did not predict the likelihood of 4-year-olds producing an informative expression. In contrast, the 7-year-olds patterned like the adults: they were least likely to produce an underinformative expression if they had fixated the contrast object before speaking, and most likely to produce an underinformative expression if they had not (all $ps < .05$).

Results suggests that even if younger children engage in comparison activity, they do not always integrate that information into their referential choices. Like adults, older children encode information gleaned from their visual scanning behaviour.

References

Matthews, D., Lieven, E. & Tomasello, M. (2007). How toddlers and preschoolers learn to uniquely identify referents for others: A training study. *Child Development*, 78, 1744-1759.

Whitehurst, G. J. (1976). Development of communication - changes with age and modeling. *Child Development*, 47(2), 473-482. Presentation 2:

PRESENTATION 2:

How do children learn to avoid referential ambiguity? Evidence from eye tracking.

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Children have considerable difficulty producing informative referring expressions, a fact that still lacks a full explanation (Glucksberg & Krauss, 1967). Insight may come from models of ambiguity avoidance in adults, which suggest that, before describing any scene, speakers pro-actively monitor for potential ambiguity, and then subsequently

monitor whether their just-produced expression provides an ambiguous description (Ferreira, Slevc & Rogers, 2005). Our experiments used eye tracked referential communication tasks to assess the developing roles of these skills in children's referential communication. (NB. All data are analyzed using mixed models, reported results are significant $p < .05$).

Experiment 1, with adults, shows that eye movements can index the processes of a) pro-active and b) self monitoring.

Before naming a target picture, adults were more likely to saccade to a contrast object, if the two were of the same type (e.g., two different birds).

After providing an uninformative description, adults were also more likely to saccade to the contrast object, suggesting that self-monitoring allowed error detection.

Experiment 2 found that children (3-to-5 years, $n = 69$) typically do not pro-actively monitor for potential ambiguity: in the same referential communication task, these children were typically underinformative. However, their eye movements showed that, a) on trials for which they produced informative expressions, they engaged in proactive monitoring, and b) that they self-monitored, gazing to the contrast object after producing an uninformative description.

Experiment 3 (4-to-5 years, $n = 41$) replicated both of these results, and also tested whether self-monitoring allows children to be more informative on subsequent utterances. Interestingly, while children showed strong evidence of self-monitoring, it rarely led them to produce more informative utterances.

We discuss how these two monitoring mechanisms develop, specifically proposing that self monitoring might serve as an active, unsupervised mechanism for learning to avoid ambiguity.

References

Ferreira, V.S., Slevc, L.R., & Rogers, E.S. (2005). How do speakers avoid ambiguous linguistic expressions? *Cognition*, 96(3), 263-284.

Glucksberg, S., & Krauss, R. M. (1967) What do people say after they have learned how to talk? *Studies of the development of referential communication. Merrill-Palmer Quarterly of Behavior and Development*, 309-316.

PRESENTATION 3:**Do children with autism spectrum disorder take common ground into account during the production of referring expressions?**

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Reference production by individuals with autism spectrum disorders (ASD) has most frequently been examined within narrative and director tasks. Narrative tasks often burden either episodic memory or imagination and may not require participants to perspective-take (e.g. Arnold, Bennetto & Diehl, 2009). Director tasks, meanwhile, have manipulated only visual perspective taking (e.g. Nadig, Vivanti & Ozonoff, 2009). The current study manipulates social common ground; that is, the experiences which one has shared with a specific interlocutor.

22 children with ASD and 22 well-matched typically developing children aged 5-8 years old provided instructions to make construction toys in two within-subjects conditions: Knowledgeable Listener (where the participant had previously shared the construction experience with the addressee) and Naive Listener (the addressee was not present as the toy was constructed). Each construction activity contained various items for which there were referential alternatives, such as a small battery which would make an electric circuit light up, and a big battery which would not. When instructing the naive listener, complex referring expressions (e.g. 'small battery') were appropriate. However, for the knowledgeable listener, bare noun phrases (e.g. 'battery') were appropriately informative, since the speaker could assume listener knowledge.

If children were aware of listener informational needs, they should use complex referring expressions more frequently in the Naive than in the Knowledgeable Listener condition. Children with ASD altered the complexity of referring terms based on listener needs to a lesser extent than typically developing children. Nonetheless, they tended to use more complex referring terms when addressing an unfamiliar listener than when instructing a listener familiar with the activity. These findings suggest that, whilst not as pragmatically informative as typically developing children in this regard, children with autism do have some awareness of social common ground.

References

- Arnold, J. E., Bennetto, L., & Diehl, J. J. (2009). Reference production in young speakers with and without autism: Effects of discourse status and processing constraints. *Cognition*, 110(2), 131-146.
- Nadig, A., Vivanti, G., & Ozonoff, S. (2009). Adaptation of object descriptions to a partner under increasing communicative demands: A comparison of children with and without autism. *Autism Research*, 2(6), 334-347.

PRESENTATION 4:**Cognitive interplay between syntax and discourse-pragmatics in language development: Preferred Argument Structure in English referential choice.**

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Referential choice is one of the most important aspects of language that children learn. They must integrate developing knowledge of discourse-pragmatics with language-specific morphosyntactic constraints to produce appropriate referential forms while monitoring the interlocutor's attention. One model of how these sources of information are integrated is Du Bois' (1987) Preferred Argument Structure (PAS). PAS states that new referents in the discourse are preferentially realized as lexical NPs and appear as either the subject of an intransitive verb (S) or the object of a transitive verb (O). In contrast, given referents are typically realized as pronouns or null forms and appear as the subject of a transitive verb (A). Furthermore, clauses preferentially contain a maximum of one new and one lexical referent (1).

I [pronominal-given] want a cookie [lexical-new].

Although both adult and child speakers have been shown to conform to PAS in numerous languages (Du Bois, Kumpf & Ashby, 2003), child studies have focused on null-subject languages. This study investigates child and adult adherence to PAS in a non-null-subject language, English, and explores how children's socio-cognitive and attentional abilities differ from those of adults.

Four monolingual English-speaking children were videotaped at ages 2;0 and 3;0 in spontaneous interactions with caregivers. Each argument was coded for referential form, grammatical role, and referent accessibility.

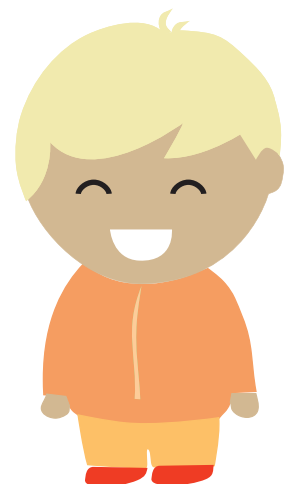
All three groups – 2;0, 3;0, and caregivers – rarely produced two new or two lexical referents per clause (0-3%), conforming to PAS. However, all groups produced more new referents in O-position (52-61%) than in S (10-22%) and A (3-8%), and more lexical referents in O (31-55%) than in S (12-22%) and A (6-7%), not conforming to PAS. This indicates a nominative vs. accusative pattern in English (Huang, 2012). Findings suggest that socio-cognitive factors such as attention to animacy may override linguistic factors such as PAS in non-null subject languages.

References

Du Bois, J. W. (1987). The discourse basis of ergativity. *Language*, 63, 805–855.

Du Bois, J. W., Kumpf, L. E., & Ashby, W. J. (Eds.). (2003). Preferred argument structure: Grammar as architecture for function (pp. 81-108). Amsterdam: Benjamins.

Huang, C. (2012). Preferred argument structure in Mandarin child language. *Taiwan Journal of Linguistics*, 10(2), 119-168.



DAY
4

THURSDAY, 20TH

10:30-12:30, ROOM D201

SYMPOSIUM

Parental Estimates of Language Input to Multilingual Children: Methodological considerations and future directions.

CONVENER: Leher Singh, National University of Singapore, Singapore, [leher.singh.nus@gmail.com/](mailto:leher.singh.nus@gmail.com)

Research in childhood bilingualism often relies heavily on researchers' ability to accurately place children into language learning groups, such as monolingual, bilingual, trilingual etc. A common approach when conducting research with infants and young children is to survey parents about their child's language background (e.g. the Language Exposure Questionnaire, Bosch & Sebastián-Gallés, 1997). However, the validity and reliability of parent reports of multilingual input remain unclear. This symposium comprises four Presentations, each of which approach issues concerning the reliability and validity of standard language background questionnaires from different angles. The first talk presents the results of an analysis that correlated parents' responses on a language survey from a day-in-the-life questionnaire (where parents talked through a typical day detailing language input to their child) to their global estimates of language exposure. Results demonstrated strong associations across these measures for monolingual children, but weaker associations for bilingual children, the reasons for which will be discussed. The second Presentation related parents' responses on a language exposure questionnaire to recordings taken within the home to directly capture language input. Results revealed inconsistencies between measures due to systematic under-reporting of the minority language on questionnaires. The third Presentation related parent reports of language exposure to bilingual children's capacities for native language processing in infancy and the preschool years. Results revealed significant associations between parent report and native language processing in infants; however, in preschool children, parent estimates did not predict language processing, although teacher estimates did. Finally, a fourth Presentation builds on existing language exposure questionnaires to create a new instrument, incor-

porating both time- and event-based input as well as data from the recipient and source of input. In combination, these investigations are methodologically significant in identifying potential contributions of parent estimates of language input, as well as some limitations.

References

Bosch L., Sebastián-Gallés N. (1997). Native-language recognition abilities in four month-old infants from monolingual and bilingual environments. *Cognition* 65 33-69. 10.1016/S0010-0277(97)00040-1

PRESENTATION 1:

Comparing global and day-in-the-life estimates of language exposure

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Accurate assessing children's language background is important, particularly in studies of bilingual children. Typically, researchers must rely on parental report. One approach is to obtain simple global measure, e.g. asking "What percent of your time does your child hear each language?" A second approach is a day-in-the-life interview, where a researcher walks parents through a child's typical day, focusing on which caregivers speak which language, and how often they interact with the child. The goal of this study was to compare these approaches.

Data from 343 participants was collected in a laboratory that focuses on experimental studies. Families of infants aged 8-32 months were invited to the lab on the basis of a rapid phone screening, when they purportedly met study inclusion criteria for being either monolingual (>90% exposure to the native language) or bilingual (at least 25% exposure to each of two languages, and <10% exposure any third language). In the lab, parents provided a global estimate of their children's language exposure on a demographics form. Later, trained research assistants administered a day-in-the-life questionnaire.

Using both the global and the day-in-the-life estimates, we used the study inclusion criteria to classify children as being "monolingual", "bilingual", or "other" (i.e., not meeting inclusion criteria for either group). The intra-class correlation was moderate (ICC = .54) suggesting that children's inclusion in a group was not necessarily stable across measurement approaches. Over 90% of children classified as monolingual via the global estimate met criteria for being monolingual using the day-in-the-life estimate. However, the same was only true of 75% of bilingual children. Compared to day-in-the-life

estimate, the global estimate consistently reported greater exposure to children's non-dominant (less-heard) language. These results underscore the challenge of reliably measuring bilingual children's exposure to different languages, and suggest that some approaches may introduce systematic biases.

PRESENTATION 2:

Using Home Recordings to Confirm Parental Estimates of Language Exposure

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Accurately quantifying the amount of language exposure infants receive is necessary to classify infants in bilingual studies into bilingual and monolingual groupings. In modern research, exposure is typically assessed via parental report. One such method is the Language Exposure Questionnaire (LEQ: Bosch & Sebastián-Gallés, 2001), which asks parents to provide detailed daily and global estimates of their child's exposure to their language(s). To determine the accuracy of this common tool, we employed a home recording procedure called the LENA system to confirm the language exposure percentages given by parents via the LEQ. This measurement tool comprises a small electronic recording device that is unobtrusively placed in the chest pocket of specially designed overalls worn by the child. Parents were given the LENA recording equipment and clothing for one week when their bilingual-exposed infants were between 6 and 12 months of age. Parents were asked to record two typical days at home. The LENA software calculated the total words heard by the infant. We separate English and French by analyzing 5-minute blocks of speech and determine whether the infant was hearing English, French, or a mixture of both. One quarter of these blocks, as well as any flagged blocks (i.e., unclear if adult is speaking English or French), were coded by a second coder. Correlation analyses are determining if parental report measures truly reflect language input via home recordings. Testing is still in progress. However, preliminary results indicate that parents are systemically over-reporting their infants' exposure to the minority language of the community. This may reflect a social desirability bias in parents' responding, as bilingualism is a social and economic advantage in the area where the participants reside. These analyses will help refine parental report measures to better reflect actual input to bilingual children.

References

Bosch, L., and Sebastián-Gallés, N. (2001). Evidence of early language discrimination abilities in infants from bilingual environments. *Infancy* 2, 29-49. doi: 10.1207/S15327078IN0201_3

PRESENTATION 3:

Relationships between parent estimates of language input to bilingual children and native language processing

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Research on bilingual infants and children standardly poll parents about their child's language environment, using this information to group participants by language background. Very little is known about whether parent estimates correspond to laboratory-based measures of language proficiency. Drawing from three experimental tasks (infant speech discrimination; infant novel word learning; preschool word learning), parent estimates of language input to their bilingually exposed children (n=242) was related to performance on experimental tasks. The first task involved discrimination of Mandarin tones in English-Mandarin bilingual infants from 6 to 12 months of age. Analyses revealed that parent estimates of Mandarin input were significantly correlated with infants' sensitivity to the Mandarin tone system, when age was controlled. The second task measured infants' abilities to learn English words contrasted by vowels; results revealed significant associations between parent estimates of English exposure and novel word learning. The third task measured novel word learning in preschool children in both English and Mandarin. Three estimates of language exposure were collected for each native language: experimenter ratings based on a short, semi-structured conversation, teacher ratings of proficiency, and parent estimates of exposure and proficiency. Neither parent nor experimenter estimates correlated with accuracy of word learning in either language; however, teacher ratings correlated with accuracy of word learning in both languages. Results suggest that relationships of parent estimates of bilingual exposure and native language processing may be age-dependent, and that as children get older, this relationship may weaken. In preschool children, more so than parent ratings or direct observation by experimenters, teacher ratings may be more closely linked to language processing measures.

PRESENTATION 4:**Measuring multilingual exposure in infancy using the Multilingual Infant Language Questionnaire (MILQ)**

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Linguistic exposure is arguably the most crucial factor of multilingualism. Several issues directly linked to exposure, such as the relationship between the development of one language and the amount (e.g., language dominance), the type (e.g., language directness), and the impact (e.g., social function) of exposure to that language, require further understanding. The influence and weighting of some additional factors like speaker accent, fluency, talkativeness, and language mixing have not been well-understood.

Previous multilingual studies differ in the way participants' linguistic exposure is measured, and pros and cons exist for each type of measurement. A 247 camera recording system provides detailed temporal and locative speech information in the home (Roy et al., 2006). Nevertheless, it is difficult to extend such recording to the social environment. Language environment analysis advances our understanding of infants' quantitative and qualitative linguistic input (Gilkerson et al., 2008). However, the analysis is primarily designed for the monolingual English learning environment. A certain degree of estimation of the exposure is typically required across measurements at the current stage.

Following previous literature (e.g., Place & Hoff, 2011), we propose to deal with the measurement of linguistic exposure in a decomposed fashion, beginning with the idea that one's overall environment can be separated into small chunks. We discuss the following points: 1) Data can be collected via two main ways of chunking (time- & event-based) and two angles of data collection (language receiver & provider). 2) Any exposure-related factors can be viewed as indexical factors and weighed differently along the developmental timeline. 3) Some elements from the angle of caregivers (time spent on and accuracy of the parental report) need to be considered. To integrate these points, we propose a Multilingual Infant Language Questionnaire through which we illustrate that parents have an accurate intuition of their children's general language environment.

References

Gilkerson, J., & Richards, J. A. (2008). The LENA natural language study. Boulder, CO: LENA Foundation. Retrieved March, 3, 2009.

Place, S., & Hoff, E. (2011). Properties of dual language exposure that influence 2-year-olds' bilingual proficiency. *Child development*, 82(6), 1834-1849.

Roy, D., Patel, R., DeCamp, P., Kubat, R., Fleischman, M., Roy, B., ... & Levit, M. (2006). The human speechome project. In *Symbol Grounding and Beyond* (pp. 192-196). Springer Berlin Heidelberg.

SYMPOSIUM

Toward data-driven alternatives to the consensus model of infant phonetic learning

CONVENER: Daniel Swingley, University of Pennsylvania, U.S.A., swingley@psych.upenn.edu

According to the standard, “textbook” model of infant phonetic learning, infants have innate capacities for resolving some speech sounds (particularly stop consonants), an innate speech-specific perceptual space, and domain-general perceptual clustering abilities sufficient for discovering native-language speech-sound categories. Here we add to the evidence that this model is, in some large part, inconsistent with what is known about infant-directed speech. We suggest that the developmental picture is more complex, and provide the beginnings of a way forward to a more quantitatively rich and descriptively adequate account of early phonetic learning.

The first Presentation considers the acquisition of Korean stop consonants, showing that they are not discriminated early in infancy, but must be learned from experience, possibly because learning these sounds demands the use of two distinct perceptual dimensions, F0 and VOT, which are in competition among Korean speakers today.

The second Presentation introduces a new mathematical technique (ABX-discriminability) for rigorous evaluation of phonetic learning models. Applied to infant-directed speech, the model finds that acquisition theories relying on Gaussian Mixture Models (a standard implementation of distributional learning) significantly underperform an ASR-based model, both in learning poorly and in failing to predict several well-attested effects of native-language category learning.

The third Presentation applies ABX to several corpora on a large scale. The results imply that from a raw phonetic perspective, variation among vowels and among consonants is the strongest source of variation, greater than talker variability and register.

Finally, the fourth Presentation considers how Dutch and English children learn to interpret vowel duration differently. Infant-directed speech realizations of vowel duration are, on the surface, extremely similar, indicating that simple token-based clustering cannot account for the varying developmental trajectories. However, the languages differ in duration distributions over content words, showing that lexical learning may be a prerequisite to phonological learning.

PRESENTATION 1:

Emergence of Korean infants’ ability to discriminate the three-way stop contrasts: Contributions of initial biases and nature of input

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On conventional accounts, infants can discriminate most phonetic contrasts innately, and learn to conflate similar sounds not contrasted in the native language [1]. How this learning happens is not well understood, partly because the range of contrasts tested is too limited.

We tested Korean infants’ discrimination of three-way stop contrasts. Korean’s stop contrasts vary along the positive voice onsetspectrum (VOT) spectrum: fortis, lenis, and aspirated (e.g., /p*u/, /pu/, and /phu/). Interestingly, while older Korean speakers use VOT to distinguish lenis and aspirated stops, younger speakers use F0 [2]. Analysis of Korean mothers’ production revealed that although fortis and aspirated differed primarily in VOT, lenis stops differed both in VOT and F0. Young English learning infants are sensitive to VOT cues [3]. If young infants’ early discrimination is based on certain innate acoustic cues, but not all possible phonetic cues, we predict that young Korean infants should be able to discriminate fortis from aspirated stops, but the other pairs should only be discriminated by older infants.

Using visual habituation, we tested 4-6-month-old Korean infants on discrimination of fortis-aspirated, lenis-aspirated, and fortis-lenis pairs. Infants discriminated the fortis-aspirated pair ($N=24$, $F(1, 20) = 9.229$, $p = .006$), but not the fortis-lenis pair ($N=22$, $F(1, 18) = 0.04$, $p = .952$) or the lenis-aspirated pair ($F(1, 21) = 1.051$, $p = .317$).

Only 10-12-month-olds successfully discriminated the lenis-aspirated pair ($F(1, 23) = 7.393, p = .012$).

These results confirm our prediction that Korean infants can discriminate the stop contrasts that are based on the VOT cue early on, while it takes about 10 months before they can exploit the F0 cues as well.

References

Werker, J. & Tees, R. (2005). Speech perception as a window for understanding plasticity and commitment in language systems of the brain. *Developmental Psychobiology*, 46: 233-251.

Bang, H.-Y., Sonderegger, Kang, Y., Clayards, M., & Yoon, T.-J. (2015). The effect of word frequency on the time course of tonogenesis in Seoul Korean. *Proceedings of ICPHS*.

Aslin, R., Pisoni, D., Hennessy, B., & Perey, A. (1981). Discrimination of voice onset time by human infants: New findings and implications for the effects of early experience. *Child Development*, 52: 1135-1145.

PRESENTATION 2:

Language-specific speech perception effects modeled over massive datasets: a new test of the feasibility of distributional learning

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Several computational models of infant phonetic-category acquisition have been proposed. If we take the theoretical claims behind these models seriously, exposing a model to input from language L1 and testing it on language L2 should predict cross-linguistic phonetic category perception effects observed in infants with native language L1 tested on contrasts from language L2. Thus, there is a large pool of empirical results available to systematically evaluate and compare the merits of these learning models. Such a systematic evaluation has never been attempted before. Here we propose a method for conducting this kind of evaluation, based on ABX-discriminability measures. We first validate the method using an ASR system trained with explicit supervision as a control. This model is shown to correctly predict a number of quantitative and qualitative cross-linguistic effects.

We then apply our method to a simple Gaussian Mixture Model (GMM) implementation of the distributional learning idea that is the dominant theory of infant phonetic category learning. We show that the GMM model learns something about phonetic categories; in particular a gradual increase in the overall discriminability of consonant categories is observed with training. What is learnt, however, does not appear to be language-specific: in many cases the GMM model becomes better at discriminating consonants not only in the training language but also in other languages; further, unlike the ASR control, it fails at predicting cross-linguistic effects. These results add to the existing evidence that the computational difficulty of the problem faced by infants when they learn phonetic categories has been underestimated. Future work focuses on testing other possible implementations of distributional learning, as well as some recently-proposed models in which distributional learning is supplemented with additional cues (e.g. the situational context) and operates in synergy with learning mechanisms at other levels (e.g. the lexical level).

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PRESENTATION 3:

Quantifying structured variance in the signal across three large speech corpora

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To formulate theories and create insightful tests of infants' learning of their native sound-category system, it is important to quantitatively characterize the problem they have to solve, in particular by evaluating the sources of variance in the speech signal. Though most research focuses on single native phonological contrasts, infants are also exposed to variation in speakers and in speech styles. Thus, here we used a big-data approach to measure the greatest sources of variation in speech.

A computer-based, automatized ABX task tested how well clouds of exemplars from two categories are separated acoustically (using Mel-scale filterbanks). This task yields a discriminability score that is based on comparing all combinations of pairwise distances of matched tokens within and across categories, producing a common metric for all contrasts. For example, phonetic contrasts within speakers can be measured using all possible tokens of the form $[d_{i_1} - t_{i_1} - d_{i_1}]$, where the numeral indicates the speaker; whereas $[d_{i_1} - t_{i_1} - d_{i_2}]$ additionally tests the impact of speaker change.

We used large American English corpora covering several speech styles (Articulation Index Corpus, Schatz et al., 2015; Buckeye, Pitt et al., 2007; Brent, Brent & Siskind, 2001). Linguistically, contrast identity proved the largest source of variance; speaker variation and speech style played a minor role, and these factors interacted with contrast identity, even when considering vowels and consonants separately. Notably, our chosen acoustic rePresentation might over-estimate the impact of speaker variation, thus underlining our finding that contrast identity is the largest source of structured variance. This suggests that even if infants had a purely acoustic speech rePresentation, variation among consonants and vowels could be the most salient variation. Ongoing efforts extend the present work to a corpus that covers several speech styles. This work implies that general conclusions should not be drawn based on single contrast/speaker/speech-style observations.

References

Brent, M. R. & Siskind, J. M (2001). The role of exposure to isolated words in early vocabulary development. *Cognition*, 81, 31-44.

Pitt, M.A., Dilley, L., Johnson, K., Kiesling, S., Raymond, W., Hume, E. and Fosler-Lussier, E. (2007) Buckeye Corpus of Conversational Speech (2nd release) [www.buckeyecorpus.osu.edu] Columbus, OH: Department of Psychology, Ohio State University (Distributor).

Schatz, T., Cao, X.-N., Kolesnikova, A., Bergvelt, T., Wright, J., & Dupoux, E. (2015). Articulation Index lscp (Speech Corpus No. LDC2015S12). Linguistic Data Consortium.

PRESENTATION 4:

The role of the lexicon in infants' phonetic category learning: a new crosslinguistic comparison

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Dutch- and English-learning toddlers interpret vowel duration differently: Dutch learners are willing to interpret duration contrastively, and English learners are not, with the strongest evidence coming from the Dutch /a/--/a:/ contrast[1]. The fact that English and Dutch are very similar phonologically makes this an interesting test case for theories of phonetic learning. Drawing on a corpus of almost 4,000 hand-segmented vowels from infant-directed English (2 mothers) and Dutch (1 mother) speech, we evaluate whether duration distributions are more bimodal in Dutch than in English. Such a finding would support the conventional view that distributional clustering over ex-

perienced speech-sound tokens can account for early phonetic category formation.

In fact, duration distributions over tokens are very similar in the two languages, as are residuals of regressions partialing out sentence position and speaking rate effects. There is some significant separation between long and short vowels in both languages, but the degree of separation in each language is very similar. Thus there is no evidence that the Dutch contrast can be learned over token distributions. Next we considered whether durations aggregated over words exhibit greater separation for Dutch than English. This was also false.

Finally, we considered words by category. The data show that in Dutch /a/--/a:/, the long and short vowels in content words are very distinct, in a way that is not found for English tense/lax pairs. Distributions over function words and demonstratives (like "ja", yes) were not distinctive. The results support the striking and novel possibility that phonetic learning not only requires the lexicon, but derives from the words infants are most likely to understand.

References

Dietrich, C., Swingley, D., & Werker, J.F. (2007). Native language governs interpretation of salient speech sound differences at 18 months. *PNAS*, 104, 16027-16031. doi: 10.1073/pnas.0705270104

SYMPOSIUM

Attending with my eyes, ears, and mouth: A multi-modal approach on language learning in monolingual and bilingual infants

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The symposium presents 4 studies using different modalities to investigate the role of attention in speech perception and language learning in monolingual and bilingual infants. Four modalities are reported: (1) the role of oral-motor attention in learning non-native speech sounds in monolingual infants, (2) the role of visual-oral attention in language learning in monolingual and bilingual infants, (3) the role of auditory attention in non-native speech perception in bilingual infants, and (4) the role of attention during natural interactions in language learning in monolingual infants. We first report how attention is affected in a group of infants whose oral-motor movements are restricted. This study uses a behavioral design to investigate the necessity of multisensory information in early stages of language acquisition. In a similar manner the second Presentation uses a behavioral design and focuses on the relationship between attention to facial gestures and language learning in monolingual and bilingual infants. The results demonstrate that selective attention varies across age groups and across monolinguals and bilinguals. The third Presentation focuses on attentional mechanisms that underlie the processing non-native speech sound in a group of bilingual infants. This study uses an electrophysiological design and demonstrates that the attention-demands associated in speech processing are heightened in bilingual infants due to the extra effort required in the acquisition of two phonologies. Finally, the fourth Presentation evaluates the quality of parent-child interactions during infancy in terms of enhanced attentional mechanisms that benefit language development at 33 month of age. This study uses digital recorders to assess natural everyday interactions between infants and their parents, and demonstrates that the quality of the interactions during infancy matter for later language development. Collectively, this sym-

posium will highlight the importance of attention in language learning in monolingual and bilingual infants by relying on a multi-modal and multi-method approach.

PRESENTATION 1:

Sensorimotor influences to perception of native and non-native speech in infancy

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Speech perception is a multisensory process from early in infancy. Recent work indicates that relevant oral-motor movements influence discrimination of never before heard sounds in pre-babbling infants. When a teething toy restricted English-learning 6-month-old infants' tongue tip movements, infants no longer discriminated the novel Hindi dental/da-/retroflex/Da/ speech contrast (Bruderer et al., 2015). The current study further investigates the role of articulator-specific sensorimotor influences on 6-month-old infants' speech perception. First, we are testing the role of specific tongue positions on infants' discrimination of the same non-native speech contrast as Bruderer et al. (2015), but here we used more precisely matched synthesized speech rather than naturalistic speech. We used a flat teething toy to restrict infants' movement of the tongue tip, which is expected to prevent oral-motor rePresentation mimicking distinct tongue movement required to make the sounds of the non-native Hindi contrast. Discrimination will be assessed with a looking time paradigm as in Bruderer et al. (2015). Second, we aim to investigate whether impeding either the tongue-tip or the lip selectively alters discrimination of phonemes produced with the corresponding place of articulation. Thus, with a separate group of control and experimental infants, we are testing the effect of configuring infants' lip positions by using a round teething toy, on infants' discrimination of a native, and hence frequently heard, English /ba-/da/ speech contrast, again using synthesized speech. Results following the collection of a full sample in each of the four conditions will disambiguate whether an articulator-specific sensorimotor influence is generalizable to both sound contrasts, or restricted only to sound contrasts that have not been previously heard by the infant. The outcome of the study will further contribute to our understanding of how multisensory information influences speech perception in the early stages of language acquisition.

References

Bruderer, A. G., Danielson, D. K., Kandhadai, P., & Werker, J. F. (2015). Sensorimotor influences on speech perception in infancy. *Proceedings of the National Academy of Sciences*, 112(44), 13531-13536.

PRESENTATION 2:

Read from my lips, learn from my eyes: Impact of early bilingualism on infants' ability to learn from talking faces

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While at four months, infants prefer looking at the eyes of face talking in their native language, infants from eight- till at least 12-months of age, focus more on the mouth area (Lewkowicz & Hansen-Tift, 2012). This mouth preference is stronger for infants' growing up in a bilingual environment, suggesting that shift of attention is related to language learning processes (Pons, Bosch, & Lewkowicz, 2015). Here, we investigate the consequence of infant's preference for the mouth of a speaker on their ability to anticipate subsequent non-speech movement displayed in her mouth or her eyes region. We recorded their eye gaze (N total=180) while they watched and listened to a speaker producing short sentences in their native language (Speech Event). At the end of each sentence she either raised her eyebrows (Eyebrows condition) or protruded her lips (Lip condition). Growth curve analysis (Mirman, 2014) was used to analyze the evolution (over the course of the 19 trials) of looking times to the eyes and the mouth region of the speaker, during the last 50% of the Speech Event. At 12 months, bilinguals in the Eyebrows condition (N=20), as opposed to the ones in the Lip condition (N=20), significantly anticipated the apparition of the Eyebrow movement by increasing their looking time to the eyes region of the speaker ($p < .05$). However, no change was observed in same-age monolinguals (N=20 per condition, $t < 1$). At 15-months, while monolinguals learn to anticipate the appearance of the eyebrows movement (N=20 per condition, $p < .05$), bilinguals did not (N=20 per condition, $t < 1$). It is only at 18 months that bilinguals could anticipate again the appearance of the eyebrow movement (N=20, $p < .05$). We consider the respective roles of selective attention and vocabulary acquisition to explain these different developmental trajectories.

References

Lewkowicz, D. J. & Hansen-Tift, A. (2012). Infants deploy selective attention to the mouth of a talking face when learning speech. *Proceedings of the National Academy of Sciences*, 5(109), 1431-1436.

Pons, F., Bosch, L., & Lewkowicz, D. J. (2015). Bilingualism modulates infants' selective attention to the mouth of a talking face. *Psychological Science*, 26(4), 490-498.

Mirman, D. (2014). *Growth Curve Analysis and Visualization Using R*. Chapman and Hall / CRC.

PRESENTATION 3:

Hear my voice learn from attending: non-native speech perception bilingual infants

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We recently reported a relationship between amount of language input and brain measures of attentional processes during discrimination (i.e., positive-MMR) of native and non-native speech sounds (i.e., Spanish, English and Chinese) in a group of monolingual and bilingual infants (Garcia-Sierra, Ramirez-Esparza, & Kuhl, 2016). Our results indicated that phonological rePresentations of native speech sounds in monolingual and bilingual infants are dependent on the amount of language input. The phonological rePresentations of non-native speech sounds in both groups were dependent on the existent phonetic similarities between the native and the non-native language. However, in the case of bilinguals, the results suggested that different amounts of language input in English and Spanish resulted in different patterns of brain activation and presumably different underlying attentional processes associated with speech perception. The present investigation relates attentional brain measures of non-native speech discrimination (HINDI dental /da/ - retroflex /Da/) with amount of language input in a group of Spanish-English bilingual infants (N = 16). We tested stop consonants because they occur frequently in Spanish and English, and because the Hindi stop consonants are phonetically similar to stop consonants in both Spanish and English. By controlling for phonetic similarity and frequency of occurrence we can gain a better understanding of the relation between language input and attentional mechanisms associated with language learning. Our results showed a significant correlation between attentional process during speech discrimination and the relative amounts of

language input in English and Spanish ($r(14) = -.60$, $p < .05$). Specifically, balanced bilinguals showed an attentional response to the Hindi contrast whereas bilinguals with more English exposure did not. We propose that the attention-demands associated with processing speech are heightened in bilingual infants due to the extra effort required in the acquisition of two phonologies.

References

Garcia-Sierra, A., Ramirez-Esparza, N., & Kuhl, P. K. (2016). Relationships between quantity of language input and brain responses in bilingual and monolingual infants. *International Journal of Psychophysiology*, 110, 1-17.

PRESENTATION 4:

Look Who's Talking NOW! Parentese Speech, Social Context and Language Development Across Time

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In previous studies we found that the social interactions infants experience in their everyday lives at 11- and 14-months of age affect language ability at 24 months of age (Ramirez-Esparza, Garcia-Sierra, & Kuhl, 2016; Ramirez-Esparza, Garcia-Sierra, & Kuhl, 2014). These studies investigated relationships between the speech style (i.e., “parentese” speech vs. standard speech) and social context (i.e., one-on-one (1:1) vs. group) of language input in infancy and later speech development (i.e., at 24 months of age), controlling for socioeconomic status (SES). Results showed that the amount of exposure to “parentese” speech-1:1 in infancy was related to productive vocabulary at 24 months. The general goal of the present longitudinal study was to investigate (1) how the pattern of social interactions between caregivers and their children changes from infancy to childhood; and (2) how relationships between speech style, social context, and language learning change across time. Our study sample consisted of thirty participants at 33 months of age, who participated in the previous infant studies. Social interactions were assessed at home using digital first-person perspective recordings of the auditory environment. We found that caregivers use less “parentese” speech-1:1, and more standard speech-1:1, as their children get older. Furthermore, we found that the effects of “parentese” speech-1:1 in infancy on later productive vocabulary at 24 months persist at 33 months of age. Final-

ly, we found that exposure to standard speech-1:1 in childhood was the only social interaction that related to concurrent productive vocabulary. Mediation analyses showed that standard speech-1:1 in childhood fully mediated the effects of “parentese” speech-1:1 in infancy on language development in childhood, controlling for SES. This study demonstrates that engaging in one-on-one interactions in infancy and later in life has important implications for language development.

References

Ramirez-Esparza, N., Garcia-Sierra, A., & Kuhl, P. K. (2016). The Impact of Early Social Interactions on Later Language Development in Spanish-English Bilingual Infants. *Child Development*, 1-19.

Ramirez-Esparza, N., Garcia-Sierra, A., & Kuhl, P. K. (2014). Look who's talking: speech style and social context in language input to infants are linked to concurrent and future speech development. *Developmental Science*, 17(6), 880-891. doi:10.1111/desc.12172

SYMPOSIUM

Helsinki longitudinal SLI study (HelSLI) – focus on vocabulary at multiple levels of analysis

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Developmental challenges, such as, developmental language impairment (LI), need to be investigated at multiple levels of analysis, in a longitudinal setting (Bishop et al., 2016; Pennington, 2006). In January 2013, we launched the Helsinki Longitudinal SLI study (HelSLI) at the Helsinki University Hospital, Finland (<http://tiny.cc/helsli>). The cross-sectional data gathering is now complete with 246 3–6-year-old children with suspected LI and their 160 typically developing peers (TD). In five subprojects, we investigate LI at etiological, cognitive, and behavioral levels of analysis: how the child's psychological characteristics and environment influence LI, how the child's well-being is affected by LI, the characteristics of LI in bilingual children, nonlinguistic cognitive correlates of LI, electrophysiological markers for LI, and the role of genetic risk factors. The main aim is to improve our understanding, risk detection and early identification of LI in mono- and bilingual children.

The current symposium will present results on the cross-sectional phase of the study with a special emphasis on vocabulary development. Finnish language offers a unique window to vocabulary development with its rich inflectional system and long words occurring in numerous morphological forms.

First talk describes effects of age and exposure on receptive and expressive vocabulary in mono- and bilingual LI and TD children. The second Presentation reports results on the relations between nonword repetition and vocabulary in the same groups. Third, we report measures of nonverbal sequential short-term memory as predictors of receptive and expressive vocabulary in monolingual TD and LI children. Fourth, we present electrophysiological

findings on complex word processing and learning in the monolingual groups.

Our longitudinal study opens an exceptionally comprehensive view on the underpinnings of developmental LI. The symposium will present our latest findings on vocabulary, reporting on a substantial number of mono- and bilingual LI and TD children learning words embedded in rich morphology.

References

Bishop, D.V.M., Snowling, M.J., Thompson, P.A., Greenhalgh, T., & CATALISE consortium (2016). CATALISE: A Multinational and Multidisciplinary Delphi Consensus Study. Identifying Language Impairments in Children. PLoS ONE, 11(7): e0158753. doi:10.1371/journal.pone.0158753

Pennington, B. F. (2006). From single to multiple deficit models of developmental disorders. Cognition, 101(2), 385-413, doi:DOI 10.1016/j.cognition.2006.04.008

PRESENTATION 1:

Receptive and expressive vocabulary in typically developing and language impaired first and second language (L2) learners - emphasis on exposure and age effects (HelSLI study)

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Research questions : Substantial differences in the size of vocabulary between monolinguals and bilinguals have been observed when assessing one language (Thordardottir et al., 2006; Verhoeven et al., 2011). However, age and exposure effects have been rarely considered simultaneously. The aim of the present study is to examine how typically developing (TD) and language impaired (LI) monolingual (Mo) and sequentially bilingual (Bi) children with immigrant background perform in vocabulary assessments and what the effects of age and exposure are. There are no previous data on LI in sequentially multilingual setting, with the highly agglutinating Finnish as L2.

Methods

Receptive and expressive vocabulary of mono- and bilingual TD and LI children were assessed with one receptive vocabulary test and two expressive vocabulary tests. Cross-sectional data were analysed for groups MoTD, BiTD, MoLI and BiLI using the general linear model and including all significant interactions in the final model.

Results

Overall, MoTD children outperformed all the other groups. Also, these differences increased with age except compared to the bilingual group with most exposure. BiTD children with less than three years of exposure resembled MoLI. The effects of exposure on receptive vocabulary seem to be parallel in TD and LI children. In expressive vocabulary tasks, however, exposure dependent improvement was less prominent. Benefits of long exposure were more pronounced in older children.

Conclusions

Often performance of BiTD follows the course of MoLI children when assessing only one language. However, age and exposure effects should be considered since they might be somewhat different in mono- and bilingual TD and LI children, also depending on a task type. Here, exposure benefited BiLI children more in receptive vocabulary task compared to expressive. Further, difference in performance in receptive vocabulary task between BiLI and BiTD was more remarkable than difference between the groups in expressive tasks, suggesting that receptive mode would be better for differentiating LI.

References

Thordardottir, E., Rothenberg, A., Rivard, M-E. & Naves, R. (2006). *Journal of multilingual communication disorders*, 4, 1-21.

Verhoeven, L., Steenge, J., van Weerdenburg, M. & van Balkom, H. (2011). Assessment of second language proficiency in bilingual children with specific language impairment: A clinical perspective, 32, 1798-1807.

PRESENTATION 2:

Nonword repetition skills in monolingual and bilingual children with and without language impairment (HeISLI Study)

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Research questions

The nonword repetition (NWR) task which involves the ability to perceive, store, recall and reproduce phonological sequences, has received much attention in investigations because of its potential to identify children with language impairment (LI). The skills mentioned above are also essential in word learning. The association between nonword repetition and word learning is typically strongest during the early stages of language acquisition (e.g. Gathercole, 2006). Furthermore, it has been noted that children's varying proficiency in multiple languages may play a role in NWR (e.g. Summers et al. 2010).

Methods

Thus, we studied the group differences in the accuracy of NWR and how age, gender, language exposure and vocabulary skills are associated with NWR. Four groups of children aged 3–6 years participated in the study: monolingual and sequentially bilingual children with LI (MoLI and BiLI) and monolingual and sequentially bilingual children with typical development (MoTD and BiTD). The NWR task and a receptive test of vocabulary were administered. The NWR items followed Finnish phonotactic patterns in syllable structure but excluded marginally occurring and late emerging phonemes. They were presented individually through a computer with headphones. Responses were audiorecorded for later transcription.

Results and conclusions

A general linear model (GLM) procedure used for analyses revealed significant main effects for group (LI vs. TD), age, language exposure and receptive vocabulary: the TD-group performed better than the LI-group, and NWR improved with increasing age, vocabulary skills and exposure to Finnish. However, there was a significant interaction between LI/TD-group and language exposure, such that increasing exposure to Finnish improved the NWR performance of TD-children but not that of LI-children. The results imply that NWR may be a potential clinical marker for LI in Finnish, furthermore suggesting that a relatively small amount of exposure to Finnish is sufficient for a good level of phonological abilities in TD-children.

References

Gathercole, S. E. (2006). Nonword repetition and word learning: the nature of the relationship. *Applied Psycholinguistics*, 27, 513–543.

Summers, C., Bohman, T. M., Gillam, R. B., Peña, E. D. & Bedore, L. M. (2010). Bilingual performance on nonword repetition in Spanish and English. *International Journal of Language and communication Disorders*, 45, 480–493.

PRESENTATION 3:

Relations between nonverbal serial short-term memory and vocabulary in typical and impaired language acquisition (HeISLI study)

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Research questions

Language acquisition and, more specifically, vocabulary growth in childhood are rapid but not linear processes. One of the suggested basic cognitive factors affecting this process is phonological short-term memory (STM) capacity (Gathercole et al., 1992){Laasonen, 2012 #1437}. However, to what extent non-linguistic factors affect this process of vocabulary growth is not known. Despite previous findings linking domain-general serial order impairment to dyslexia (Laasonen et al., 2012){Laasonen, 2012 #1437}, the role of serial STM beyond verbal or phonological material in LI remains unknown (Lum et al., 2012). One subproject of the Helsinki longitudinal SLI study (tiny.cc/helSLI), HeISLI-cognitive, concentrates on nonlinguistic correlates of LI. Here we present results from nonverbal STM experiments in six tasks and two modalities and their links to both receptive and expressive vocabulary.

Methods

4-to-6-year old monolingual children with LI and their TD peers played tablet games targeting nonverbal visual and auditory STM for temporal sequences. The increasingly long stimulus sequences consisted of visually presented animated fantasy animals or

auditory animal calls. The tasks assessed the capacity limit of matching of binary sequences, each including only two different animals or two different animal sounds. Vocabulary was assessed with the WPPSI-III receptive and expressive vocabulary tasks.

Results

Overall, nonverbal serial STM performance was positively related to vocabulary performance. There was a significant interaction between LI/TD-group and nonverbal STM tasks when predicting vocabulary tasks. That is, performance in vocabulary tasks was differently predicted by nonverbal serial STM performance in the LI and TD groups.

Conclusions

The current results replicated the previously found association between STM and vocabulary growth. However, they also dramatically generalized this finding to non-linguistic serial STM suggesting that domain-general temporal sequence processing may play a role in early vocabulary acquisition.

References

Gathercole, S. E., Willis, C. S., Emslie, H., & Baddeley, A. D. (1992). Phonological Memory and Vocabulary Development during the Early School Years - a Longitudinal-Study. *Developmental Psychology*, 28(5), 887-898. doi:Doi 10.1037//0012-1649.28.5.887

Laasonen, M., Virsu, V., Oinonen, S., Sandbacka, M., Salakari, A., & Service, E. (2012). Phonological and sensory short-term memory are correlates and both affected in developmental dyslexia. *Reading and Writing*, 1-27. doi:10.1007/s11145-011-9356-1

Lum, J. A. G., Conti-Ramsden, G., Page, D., & Ullman, M. T. (2012). Working, declarative and procedural memory in specific language impairment. *Cortex*, 48(9), 1138-1154. doi:10.1016/j.cortex.2011.06.001{Laasonen, 2012 #1437}

PRESENTATION 4:

Neural memory trace formation for complex words in LI: an EEG study (HeISLI Study)

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Research questions

Children with developmental language impairment (LI) have various difficulties, many of them related to morphological processing (Bishop, 2014). This may also have an effect on vocabulary development, especially in morphologically rich languages, where most words are presented in a complex form. An EEG study with adults in a passive listening paradigm showed distinct neural responses for inflected (plural nouns, such as 'song+s') and derived (nouns, such as 'sing+er') as well as novel word controls (e.g., fong+s, fong+er; Leminen et al., 2013). However, the developmental aspect of processing such forms remains poorly understood. It is also unclear how children with LI learn and process such complex words. Here, we aimed at elucidating both the architecture of neural rePresentations for morphologically complex words and the dynamics of memory trace formation during passive listening.

Methods

Event-related EEG responses were recorded from 20 monolingual children with LI and 15 typically developing (TD) children aged 3-4 years, as they heard existing and novel words in a passive listening setup while they were watching a silent cartoon. We analysed the change in ERP responses to complex word endings during one experimental session (10 minutes).

Results and conclusions

In TD children, the neural response grew only to inflection endings, suggesting memory trace build-up, presumably because inflected complex words are more dependent on combinatorial processing, whereas derived words are more strongly stored as a full forms. However, in children with LI, the memory trace for either of these two-morpheme combinations did not change during passive listening. This indicates that the formation of new neural rePresentations of complex words is either slower, qualitatively impaired, or requires more attentional resources compared to TD children. Importantly, we did not find group differences in the novel word condition, which suggests that an automatic memory trace formation was possible for existing root morphemes only.

References

- Bishop, D. V. (2014). Problems with tense marking in children with specific language impairment: not how but when. *Phil. Trans. R. Soc. B*, 369(1634), 20120401. doi:10.1098/rstb.2012.0401.
- Leminen, A., Leminen, M., Kujala, T., & Shtyrov, Y. (2013). Neural dynamics of inflectional and derivational morphology processing in the human brain. *Cortex*, 49(10), 2758-2771. doi:10.1016/j.cortex.2013.08.007

DAY
4

THURSDAY, 20TH

14:00-16:00,

AMPHI LUCIE AUBRAC

SYMPOSIUM

Development and diversity of narrative-stance in typically developing and non-typically developing children's narratives

CONVENER: Ayhan Aksu-Koç, Bogaziçi University, Istanbul, Turkey, koc@boun.edu.tr

This symposium explores the acquisition of 'narrative-stance' in children's stories. This represents a multifaceted set of choices that tellers make regarding what content to tell, from whose perspective, what linguistic means to use for different discourse functions and so on. In addition, these choices reflect the narrator's subjective construal of reality. Emergence of stance in children's narratives involves the complex interplay of conceptual and linguistic components. Children's subjective construal has been typically investigated through evaluative markers by analyzing the linguistic means used (mental verbs, character speech, hedges) with less attention paid to conceptual underpinnings and changing form/function relations. This symposium attempts to remedy this situation. The four papers focus on different facets of narrative stance by examining form-function relations through either referentiality or evaluation, while also analyzing narratives from different languages, populations, ages, and modalities.

Presentation 1 examines narratives of 3- to 5-year-olds for stance and subjectivity through evaluative and evidential language indicating that while younger children start with the narrator's perspective, older children adopt the character's perspective. Presentation 2 compares narratives of 3- to 5-year-old English-, Greek- and Turkish-learners for shifts between character perspectives, probing the relations between referential adequacy of forms and flexibility of cognitive strategies used. Both similarities and differences are found for linguistic and cognitive strategies across languages. Presentation 3 also approaches identification of stance through referential language. Narratives of 8-year-old children with autism are analyzed for use of pronoun-referent mappings in maintaining and reintroducing characters. The overreliance of autistics on definite constructions is explained by

the pragmatic concern of avoiding referential ambiguity, rather than limited perspective taking abilities. The findings of Presentation 4, which show that children with autism display higher usage of gestures accompanying speech in their explanations in third- than first-person narratives, similarly suggest a differentiated narrative-stance and form-function relations.

PRESENTATION 1:

Narrative stance and subjectivity in early storytelling

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This study focuses on two dimensions of subjectivity in storytelling, evaluation and evidentials, with 3-, 4-, and 5-year-olds, and examines how they contribute to the construction of narrative stance. Evaluative language refers to the non-factual elements in the narrative (the expressive function) and evidentials to the status of knowledge; and both can be expressed from the narrator's or a story-character's perspective. For this age group, very few studies have examined the development of evaluative language in narratives and no study has examined the development of evidentials. Research with older children indicates that evaluative language emerges during the early elementary years and continues developing in late adolescence. However, certain stimulating environments can help children express and possibly develop these skills earlier.

We examined the first and last story produced by 30 children through a storytelling/story-acting activity over the course of the year. Children volunteered telling stories to their preschool teacher daily who transcribed them verbatim and these were acted out later for the entire class. For evaluative dimensions, we coded each clause for attributes, emotion, cognition, intention, physical state, and reported speech. For evidential markers, we coded source of information (perception, language, and inference), attitude towards knowledge (causality, epistemic, and deontic expressions), and relational aspects (intensifiers, mitigators, and comparators). For each coded element, we marked the corresponding perspective as either the narrator's or the character's.

Our results indicate that older children used a significantly higher number for many of these components than did younger children, but some of these effects were modulated when we controlled for story length that increased significantly with age.

Markers referred most often to the narrator and only among 5-year-olds to characters with some frequency. Storytelling activities in the classroom had a positive effect on children's last stories, indicating that appropriate educational contexts can improve storytelling abilities.

PRESENTATION 2:

Cognitive and linguistic strategies in English, Greek and Turkish children's narratives

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Well-formed stories require the interplay of linguistic and cognitive abilities. One mechanism that renders a text coherent is referential adequacy that ensures unambiguous reference to story characters. Languages offer different means to mark new, given and presupposed information, presenting children with different acquisition problems. The present study compares English, Greek and Turkish preschoolers' ability to deploy appropriate referential forms to introduce, maintain and reintroduce story characters. These languages differ typologically: English and Greek have obligatory article systems but differ in morphological richness, while Turkish uses case marking and word order.

Referential adequacy interacts with how story coherence is achieved at the conceptual level. Our research question was whether achieving referential adequacy is associated with greater cognitive flexibility at the conceptual level. We examined whether children adopt different strategies when referring to two equally active characters who shift in degree of agency across the story: focus on a single character, on both characters in succession, or subordinate one to the other while shifting perspectives between them.

For each language, 45 children distributed equally across 3-, 4-, and 5-year-olds, and 12 adults told narratives elicited by two 4-picture stories, each with two equally active characters. Stories were coded for (1) *referential form per discourse function*: indefinite/definite NP, overt/null pronoun, and (2) *perspective shifts*: single character, two characters in successive blocks, in alternation, or as integrated-interacting.

Results indicate that Greek-children produced more referentially adequate introductions with indefinite NPs than English- and Turkish-children, who in turn used more pronouns and definites,

respectively. For reintroductions all children used adult forms by 4- and for maintenance by 3-years. Cognitive strategies showed a parallel age pattern. Two character strategies increased at 4, with the more flexible integrated-interacting strategy increasing at 5, but only for Greek children. Referential forms and cognitive strategies indicate moderate correlations for all languages.

PRESENTATION 3:

Perspective shifts in character reference in narration: A comparison between children with typical development and High Functioning Autism

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Individuals with Autism Spectrum Disorder (ASD) have been shown to have difficulties with cognitive empathy, specifically perspective taking. Failure in perspective taking in the language domain has been mainly reflected in personal pronoun reversal, i.e. saying *you* when meaning *I* and vice versa (Tager-Flusberg, 1994). The present study aimed to determine whether children with High Functioning Autism (HFA) show problems in perspective taking in their narratives by investigating both their ability to maintain and reintroduce characters in story retelling, and their use of discourse-appropriate pronoun-referent mappings following changes of referent status in discourse.

Participants were two groups of 8-year-old children: 40 Greek-speaking children with HFA and 40 age- and language-matched typically-developing (TD) children. Narrative retellings were elicited with the Edmonton Narrative Norms Instrument (Schneider, Hayward, & Dubé, 2006). Children's narrations were scored for frequencies of character Maintenance and Reintroduction, as well as for types of referring expressions used in the specific discourse functions. The referring expressions included definite and indefinite Determiner Phrases (DPs), clitics, null subject pronouns, and strong pronouns.

Compared to the TD group, the group with HFA had fewer tokens of character maintenance and more instances of character reintroduction. With respect to form-function mappings in each group, in contrast to TD children who showed robust preference for null subject pronouns in Maintenance, the HFA group tended to use both null pronouns and defi-

nite DPs. In Reintroduction, while definite DPs was the most preferred referential form in both groups, the frequency of DPs for the HFA children was over twice that of the TD children. It is argued that the differences between the two groups stem from HFA children's overreliance on the definite DP form as a means to avoid using referentially ambiguous pronouns, rather than from preserved perspective taking abilities.

References

Schneider, P., Hayward, D., & Dubé, R. V (2006). Storytelling from pictures using the Edmonton Narrative Norms Instrument. *Journal of Speech-Language Pathology and Audiology*, 30, 224-238.

Tager-Flusberg, H. (1994). *Constraints on language acquisition: Studies of atypical children*. Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

PRESENTATION 4:

Telling stories across gesture and speech by children with autism and with typical development

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Children with autism spectrum disorder (ASD) show weakness in the narrative domain. They produce shorter and less complex narratives and are more likely to omit key story components from their narratives (e.g., Loveland et al. 1990; Capps et al., 2000; Tager-Flusberg, 1995). In this study, we ask whether the difficulties children with ASD show in narrative production hold across narratives told from different perspectives (first person vs. third person) and whether evidence of these weaknesses can also be found in gesture.

We examine this question by studying the gestures and speech produced by 18 verbal children with ASD (M_{age}=8;0, range=4;6-10;4) and 18 children with typical development (TD; M_{age}=4;5, range=4;4-4;11), comparable in expressive language—as they completed two different narrative tasks—one eliciting *third person narratives* (i.e., narrating an animated cartoon about a bird and cat) and one eliciting *first person narratives* (i.e., narrating previous birthday party) to an experimenter.

We found that children in both groups produced longer stories when telling first person narratives than when telling third person narratives (TD: M_{number of utterances}=17.78 vs.11.39; ASD: M_{number}

of utterances=20.38 vs. 12.71), without any group differences. Importantly, children with ASD were more likely to accompany their third person narratives with gesture than their first person narratives; while children with TD were equally likely to accompany first and third person narrations with gesture (see Fig.1). Our results show similarities in speech but *not* in gesture between children with ASD and with TD in their production of first person and third person narratives. Overall, our findings show that perspective serves as an important factor in children's expression of narratives, particularly in gesture. We probe how differences in gesture relate to differences in speech in the expression of narrative components in each group to understand further why perspective matters in recounting narratives.

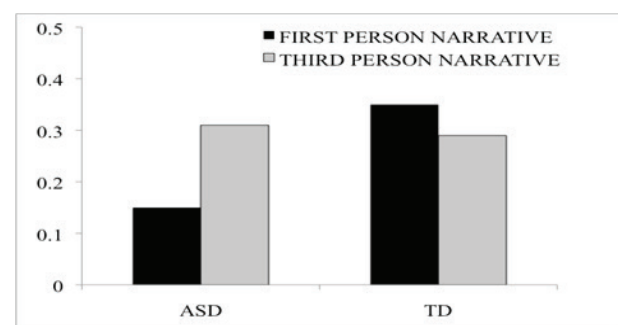


Fig.1. Mean proportion of gesture per spoken narrative utterance for children with autism spectrum disorder (ASD; left panels) and typically developing

References

Capps, L., Losh, M., & Thurber, C. (2000). "The frog ate a bug and made his mouth sad": Narrative competence in children with autism. *Journal of Abnormal Child Psychology*, 28, 193-204.

Loveland, K., McEvoy, R., Tunali, B., & Kelly, M. L. (1990). Narrative story-telling in autism and Down syndrome. *British Journal of Developmental Psychology*, 8, 9-23.

Tager-Flusberg, H. (1995). 'Once upon a ribbit': Stories narrated by autistic children. *British Journal of Developmental Psychology*, 13, 45-59.

DAY
4

THURSDAY, 20TH

14:00-16:00,

AMPHI JEAN-BAPTISTE SAY

SYMPOSIUM

Learning from Picturebooks: New Twists on a Familiar Tale

CONVENER: Elaine Reese, University of Otago,
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The value of picturebooks for children's language learning is evident from decades of research. Children learn new words and other oral language skills from shared reading interactions with parents and teachers. In this symposium, we present the latest twists on the tale. What are the conditions under which children's language learning from picturebooks is maximized or hindered? The first Presentation contains new evidence on contrasting print versus electronic books. Although parents report they share print books in richer ways than electronic books with their young children, lab studies demonstrate benefits for both types of books depending on the children's age and media experience. In the second Presentation, a new approach to shared reading in a museum context that focuses on the illustrations as an art form increases parents' reported use of strategies during the reading and children's later complex language about those illustrations. In the third Presentation, low-income rural parents' and children's reading motivation is a stronger positive predictor of shared reading frequency than is the number of books in the home. Media use, in contrast, was a strong negative predictor of reading frequency. The fourth Presentation reports on a study with preschool teachers examining the quality of their extratextual comments during shared reading sessions. Finally, the fifth Presentation reports on an intervention for parents combining interactive reading with reminiscing that produced benefits for children's new word learning and narrative skills. Together, these studies highlight the continued promise of shared reading for children's language learning in a media-rich world.

PRESENTATION 1:

Print or electronic picture books? Pitfalls and advantages for young children's learning

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The increase in electronic media has raised concerns about possible adverse effects on early child development. Here we will address three questions relevant to toddlers' learning: (1) What are parents' beliefs about their children's interactions with print vs electronic books? (2) What language and behaviours do parents and children display in these interactions? (3) Does similar learning occur? In our survey, caregivers (N=555) indicated that their children ages 1 to 4 enjoy and pay more attention to print than electronic books, and that they participate in more high-quality interactions when reading print. These reports are in line with prior studies in which parents used less content-related language during electronic than print reading with preschoolers (Chiong et al., 2012; Krcmar & Cingel, 2014; Parish-Morris et al., 2013). However, lab assessments of shared reading with matched books (N=102 dyads, 17 to 26 months) showed that toddlers in the electronic conditions paid more attention and produced more utterances and content-related talk. Parents also engaged in more content-related talk. Further research is needed to address whether the child's age and content/design of the book play a significant role in the quality of interactions around electronic books. Finally, a study assessing toddlers' learning of a novel label from either a print or electronic book (N=73) showed that 17 to 23-month-olds in both conditions learned the label within the context of the book. However, only those who read the print book generalized and transferred the label to other contexts. Older toddlers (N=28, 24 to 30 months) did generalize and transfer from the electronic book. Those children who primarily used screens to watch pre-recorded video at home transferred less from the electronic book than those with more diverse home media experiences. Thus, prior parent-child interactions around media can be an important mediator in children's learning.

PRESENTATION 2:

A picture inspires a thousand words at the Eric Carle Museum of Picture Book Art's family literacy program

Alison Sparks, Amherst College, Psychology Department, U.S.A. asparks@amherst.edu

The Eric Carle Museum of Picture Book Art has pioneered a family literacy program that teaches parents to support children's emergent literacy by

asking open-ended questions and exploring the picture book as an art form. The Carle's Whole Book Approach builds on two research-based education programs, Dialogic Reading and Visual Thinking Strategies (VTS). The Dialogic Reading research has shown that the use of open-ended questions during shared book reading enhances expressive language skills and VTS models strategies to engage children in elaborative discussions inspired by paintings. The Carle Museum educator's after-school program, implemented in urban schools in the north east of the United States, teaches parents and children to explore storybook content through discussions about text, art, and book design. In prior research on parent-child book reading, discussion that focuses on pictures has been associated with lower-level, contextualized use of language (such as labeling or describing pictures). The Whole Book Approach challenges this finding, modeling ways to integrate visual interpretation with talk about the text, real world knowledge, and personal experience. As part of the program evaluation, a pre-test post-test design was used to examine changes in emergent literacy at the end of the program. Parents reported a significant increase in their use of strategies to engage children in shared reading ($t(24) = 5.15, p = .00$) and in children's responses to shared reading ($t(24) = 5.76; p = .00$). On a measure of children's ability to interpret a story illustration, they provided significantly longer ($t(26) = 6.58, p = .00$) and more complex picture descriptions ($t(26) = 5.45, p = .00$) at program end. Thus, a focus on the visual components of a story during shared reading may be another, less understood, gateway to early literacy learning.

PRESENTATION 3:

Shared Reading in High-Risk Households: Predictors and Trade-Offs

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The value of parent-child shared reading is well established: Children who are read to often have important experiences to improve their early literacy and language skills as well as engage in important social exchanges with their parents. It is also well understood that some parents read more often to their children than do other parents, although there is limited understanding of what explains these individual differences. For instance, are parents who read regularly with their children likewise those who are motivated to read themselves? Further,

some hypothesize that there are 'trade-offs' among children's home-learning activities, with parent-child reading occurring often in homes in which other activities, especially screen-time, occur seldom. In this study, we examined the frequency of parent-child book reading in a sample involving 407 low-income rural families in American Appalachian communities. We explored three sets of predictors of home-reading frequency: (1) parent and child reading motivation, (2) home-literacy environment, and (3) home screen-time environment. Study findings showed that parent and child reading motivation was a strong, positive predictor of parent-child reading frequency, whereas the home screen-time environment was a strong, negative predictor of reading frequency. Further, the home-literacy environment, such as how many books are in the home, was not significantly related to parent-child reading frequency. Investigation of these results further showed a significant trade-off between parent-child shared reading frequency and the screen-time activities. In homes in which screen-time was lower than the threshold recommended by the American Academic of Pediatrics, parent-child reading occurred at the highest rates.

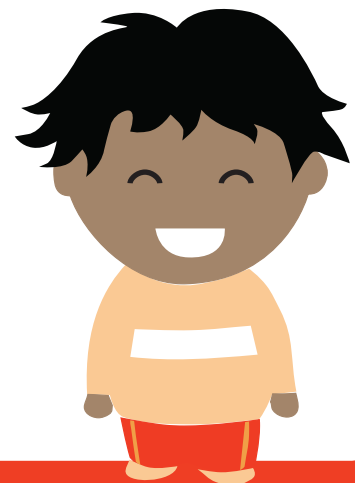
PRESENTATION 4:

Weaving Together Books and Life: Incorporating Reminiscing into Shared Book Reading

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When adults and young children share books interactively, children advance in their vocabulary and narrative skills. Other adult-child conversations outside the book-reading context, however, also foster children's vocabulary and narrative skills. *Elaborative reminiscing* about shared personal experiences is a prime example. Yet no study to date has tested the combined forces of interactive reading and elaborative reminiscing. We created an intervention for parents of preschoolers ($N = 67; M = 4; 1$ years) that contrasted a combined *Rich Reading and Reminiscing* (RRR) technique with a *Strengthening Sound Sensitivity* technique that involved reading the same 12 picturebooks interactively over 6 weeks, but with a focus on the sounds of words rather than meaning. In each of these conditions, the interactive reading was followed by either a conversation about related past experiences (RRR) or

a soundplay activity (SSS). In a third Activity-Based Control (ABC) condition, parents and children completed art, science, music, health, movement, and safety activities together over the 6 weeks. We tested the effects of the three conditions for children's new word learning and narrative skills immediately after the 6-week intervention, 7 months later, and 1 year later in comparison to baseline measures. For vocabulary, the RRR condition significantly increased children's learning of new words from the books at the immediate post-test, whereas children in the other two conditions did not acquire the target words. In their story retell skills, only children in the RRR condition significantly increased in story memory from pre-test to 7 months, and at the 1-year follow-up, children in the RRR condition had significantly better story memory skills than children in the other two conditions. Weaving children's personal experiences into storybook reading appears to be an effective way to increase their vocabulary and narrative skills in enduring ways.



SYMPOSIUM

Environmental effects in child language acquisition

CONVENER: Højen, Anders, Aarhus University, Denmark, hojen@au.dk

In acquiring language, children make use of internal mechanisms that allow them to make use of linguistic input from the external environment to gradually build their language skills. Research has revealed substantial variation in the success with which children acquire language. While children's internal aptitude for language acquisition may differ, the importance of the interaction between internal mechanisms and the external environment has received still more attention in the last two decades (Hart & Risley, 1995; Hoff, 2006). This symposium consists of a series of studies all aiming at furthering the understanding of the interaction between internal and external factors in child language acquisition. In addition, all studies differ from previous research in the area by being carried in a little-studied population (3-5-year-olds in Denmark) and by virtue of relatively large sample sizes. The studies address the interaction between language development and the proximal environmental factors of the home environment (Højen et al.), the childcare environment (Bleses et al.), the peer group composition (Justice et al.), and the interaction between child profiles and childcare intervention (Dale et al.). The overarching purpose of these studies is to identify pivotal external environmental factors in child language acquisition and, in turn, suggest initiatives that might meliorate those aspects of children's proximal learning environment that are detrimental to their language acquisition.

References

Hart, B., & Risley, T. R. (1995). Meaningful differences in the everyday experience of young American children. Baltimore: Brookes.

Hoff, E. (2006). How social contexts support and shape language development. *Developmental Review*, 26(1), 55-88. doi:10.1016/j.dr.2005.11.002.

PRESENTATION 1:

Process quality in Danish daycares serving children zero to five and associations with language and pre-literacy outcomes

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Early preschool enrollment has been shown to promote language skills, particularly for children from low socio-economic (SES) backgrounds. In Denmark, nearly all children attend daycare from age one. Danish daycares are a publicly funded universal system considered to be of generally high quality (Esping-Andersen et al., 2012). The curriculum typically features a holistic, non-formal approach with a strong emphasis on children's social development (Sylva et al., 2015) and consequently with ample opportunity for free play and little time devoted to formal instruction (Bauchmüller, Gørtz, & Rasmussen, 2014). The current study focuses on characteristics of process quality and their relations to language outcomes in Danish daycares serving children zero to five years.

CLASS Toddler and CLASS PreK were used to measure process quality: Study 1 (S1) comprised 134 daycares containing 352 classrooms and 5,359 zero to three-year-old children; Study 2 (S2) comprised 144 daycares containing 502 teachers and 3,132 three to five-year-old children attending 259 classrooms.

In S1, Emotional and behavioral support was in the high range (5.7) and similarly for Emotional support in S2 (5.8) but neither predicted language skills in children ($\beta=.11$ and 0.8 , respectively). Quality in the low range was found in S1 for Engaged Support for Learning (2.9) and for Instructional support in S2 (2.4). Higher quality was related to higher outcomes in children (S1: $\beta=.18$, $p<.010$) and S2: $\beta=.22$, $p<.001$), however only significantly so in children above three years. Low quality was associated with classrooms with a high proportion of non-Danish children. Additional analyses will focus on different aspects of process quality.

The current study suggests that the instructional quality in Danish daycares is generally low with negative consequences for children's language development. Low instructional quality may reflect the strong emphasis on socioemotional development in a free-play oriented curriculum.

References

Bauchmüller, R. Gørtz, M., & Rasmussen, A. W. (2014). Long-run benefits from universal high-quality preschooling. *Early Childhood Research quarterly*, 29, 457-470. Doi: 10.1016/j.ecresq.2014.05.009

Esping-Andersen, G., Garfinkel, I, Han, W.-J., Magnuson, K., Wagner, S., & Waldfogel, J. (2012). Child care and school performance in Denmark and the United States. *Children and Youth Services Review*, 34, 576-589. doi: 10.1016/j.childyouth.2011.10.010

Sylva, K., Erekly-Stevens K., & Aricescu, A.-M. (2015). Overview of European ECE curricula and curriculum template. WP2.1 Curriculum and quality analysis impact review, CARE. http://ECEcare.org/fileadmin/careproject/Publications/reports/CARE_WP2_D2_1_European_ECE_Curricula_and_Curriculum_Template.pdf

PRESENTATION 2:

Mixing ages in child-care settings: Does it influence children's vocabulary growth?

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A common question in the early education field is how to group children based on age, namely, whether to use same-age (SA) groupings or mixed-age (MA) groupings. A number of studies show there to be benefits of MA groupings for children's language development, but these benefits largely are for the younger children in MA groupings as opposed to the older children. A limitation of such work is that most work has focused on preschool programs serving only at-risk populations (e.g., Head Start in the U.S.). In the present study we expand on this research by examining the age composition of child-care programs across the country of Denmark, which features nearly 100% participation in child-care by young children.

This study examined the effects of age variability in 227 child-care classrooms on vocabulary growth of 2-6-year-olds, with children nested in classrooms nested in centers and controlling for dual language learner (DLL) status, gender pretest, class size, and mean age. We examined vocabulary growth within three mutually exclusive classroom age categories, for which each represented about 33% of the sample of classrooms: (1) limited range (all children within 12 months of age of one another), (2) medi-

um range (all children within 24 months of age of one another), and large range (all children within 36 months of age of one another). Across these categories, and including the previously mentioned covariates, we found children's vocabulary growth to be significantly larger in the medium range classrooms compared to limited and large range. Investigation of children's age did not show the results to be conditional on age, such that younger children did not especially benefit from MA classrooms. Collectively, results show that vocabulary growth is maximized in MA classrooms, but only when the mixture of children's ages does not exceed about two years.

PRESENTATION 3:

Language profile as a predictor of response to an early language and literacy intervention

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Variation in response to intervention is as important as the mean effect size. Does the intervention help children who most need it, to avoid exacerbating the Matthew Effect? Can identifying the subgroups who are least helped provide clues for improving the intervention? Definitive answers require randomized control trials, as even the best matching may not control relevant variables. Most research of this type has focused on family-level factors such as SES/maternal education, and ethnicity. We examined language profile as a predictor of response in a cluster-randomized trial conducted with 3-to-6-year-old Danish children. Childcares were assigned to a control condition or three variations of a 20-week storybook-based intervention (SPELL). In this report, we include the 3,480 children in the base SPELL intervention or the business-as-usual comparison group.

At present, analyses have been conducted only for the 4-6 year group (3 year olds received a different battery). Tests included Vocabulary, Comprehension, Communication (comprising a Language Composite), and Rhyme detection, Segmentation, and Letter identification (comprising a Pre-literacy Composite).

Preliminary findings:

1. For Pre-Literacy, but not Language, treatment effects were higher for children with lower pre-test scores, a reverse Matthew Effect.

2. Latent Class Analysis identified 6 classes at pretest. One was low on all measures (interpreted as language delayed); the other 5 were quite similar, with flat profiles on 5 measures. The difference among them was due primarily to Segmentation, which varied greatly.

3. There was little variation among the groups on the Language treatment effect.

4. In contrast, there was considerable variation in the Pre-Literacy treatment effect, $d=-.13$ to 1.24 , and this was consistently negatively associated with pretest Segmentation.

We interpret the results as reflecting the fact that segmentation is likely to receive the least stimulation both in Danish preschools and at home, and therefore it is the most responsive to intervention.

PRESENTATION 4:

The impact of the home literacy environment in native- vs. second-language acquisition

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The home literacy environment (HLE) has been shown to impact language and literacy skills in preschool-aged children via factors such as availability of books, frequency of reading and child age when parents began reading to the child (Burgess, Hecht, & Lonigan, 2002; Payne, Whitehurst, & Angell, 1994). Many dual language learners (DLL) rely on interactions in the second language outside the home to acquire second-language proficiency, but the HLE also influences second-language development in DLL, whether the native language or the second language is the primary home language (Duursma et al., 2007). However, little is known about the relative importance of the HLE for native- vs. second-language acquisition. This question was examined in 1,200 second-language and 8,000 native-language learners of Danish. The parents of the 3-5-year-old children completed a HLE questionnaire, and the children were assessed on a standardized language and pre-literacy battery. A total composite score of the language assessment battery was predicted using reading-related HLE factors separately for DLL and native learners. Because the predictor variables were on ordinal scales, dichotomous indicator variables for each answer were used in the multiple regression. STATA's `vce-cluster` was used to correct standard errors for intragroup (childcares) correlations. The results showed that the HLE predicted more vari-

ance in DLL ($R^2=.26$) than native learners ($R^2=.08$). Our interpretation is that the HLE is an even stronger predictor in DLL than native learners, possibly because learning two languages requires a highly stimulated language apparatus, which is facilitated by a supportive HLE irrespective of the language of the home.

References

Burgess, S. R., Hecht, S. A., & Lonigan, C. J. (2002). Relations of the home literacy environment (HLE) to the development of reading related abilities: A one year longitudinal study. *Reading Research Quarterly*, 37(4), 408-426.

Duursma, E., Romero-Contreras, S., Szuber, A., Proctor, P., Snow, C., August, D., & Calderón, M. (2007). The role of home literacy and language environment on bilinguals' English and Spanish vocabulary development. *Applied Psycholinguistics*, 28(01), 171-190.

Payne, A. C., Whitehurst, G. J., & Angell, A. L. (1994). The role of home literacy environment in the development of language ability in preschool children from low-income families. *Early Childhood Research Quarterly*, 9(3-4), 427-440.

SYMPOSIUM

The linguistic expression of causal relations in picture-based narratives: a focus on motion, emotion, and intention

CONVENER: Sharon Armon-Lotem, Bar Ilan University, Ramat Gan, Israel, sharon.armon-lotem@biu.ac.il/ Judy Kupersmitt, Hadassah Academic College, Jerusalem, Israel, judyku@hadassah.ac.il

The symposium addresses narrative-embedded language production, exploring the linguistic expression of motion, emotion, and intention in complex picture-based narratives produced by monolingual and bilingual children with and without SLI. Our approach probes the interaction and integration between top-down and bottom-up processes of narrative production. In order to demonstrate the universal applicability of this approach, four Presentations explore telling and retelling of picture-based narratives which made use of different material in different languages.

PRESENTATION 1:

Building up cohesive ties: a developmental study of motion and causation in picture-based narratives

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Form-function studies of narrative development in various languages revealed an increasing ability to integrate top-down and bottom-up principles of discourse production in the domains of connectivity, temporality, reference, and space (Berman & Slobin, 1994; Hickmann, 2003). This study focuses on such integration considering the linguistic expression of causal relations in picture-based narratives (ref) produced by 96 native Hebrew-speakers in four age-groups: 5, 8, 12, and adults.

Going top-down, the study explores the expression of psychological, motivational, enabling and physical causation between the content categories of the story (Trabasso et al., 1989), which is rich in motion events varying in complexity of ground and path. Bottom-up, the focus is on how children and adults manage to express intention and motion together, monitoring the selection of particular linguistic forms – at the morpho-lexical and syntactic levels – that contribute to infer the causal relations.

Results show that content categories and causal relations increase with age to represent a hierarchical goal-plan of action. Driven mostly by perceptual saliency and local cues of discourse organization, younger children express causation and motion at the level of the isolated pictures, with high reliance on local, temporal chaining of the events. Psychological relations between events and internal reactions were more frequent at all ages, elicited by perceptually salient gestures of the characters. Motivational, enabling and physical relations, which require higher levels of linguistic complexity and content elaboration, increased gradually with age. Mature narrators were able to coordinate motion with causation in more cohesive units, showing increasing command of lexical, referential and syntactic forms used to reach a more explicit level of causality.

The results are discussed in terms of the long developmental route towards mastery of narrative-embedded linguistic abilities, with particular attention to the domains of causality, intentionality and motion in the production of coherent and cohesive narratives.

References

Berman, R.A. & Slobin, D.I. (1994). *Relating events in narrative: A crosslinguistic developmental study*. Mahwah, New Jersey: Lawrence Erlbaum Associates.

Hickmann, M. (2003). *Children's Discourse: Person, Space and Time across Languages*. Cambridge: Cambridge University Press.

Trabasso, T., van den Broek, P. W., & Suh, S. Y. (1989). Logical necessity and transitivity of causal relations in stories. *Discourse Processes*, 12, 1-25.

PRESENTATION 2:

The linguistic expression of causal relations in picture-based narratives: A comparative study of bilingual and monolingual children with TLD and SLI

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The present study explores the linguistic expression of complex picture-based narratives produced by monolingual and bilingual six-years-old children with and without SLI, focusing on the selection of particular language forms used to express intention and motion together. The study explores the differences between the groups in the occurrence of four types of causal relations between the story components – motivational, enabling, psychological and physical - and in the linguistic expression of the causal relations within the complex motion event at the core of the episode. A pictures-based story (Goralnik, 1995) was narrated by 150 preschool children, ages 5-7: 50 Hebrew speaking monolinguals, 50 English-Hebrew bilinguals, and 50 Russian-Hebrew bilinguals, half with TLD and half with SLI. Bilinguals attended at least two years of Hebrew-speaking preschool. Results show that the stories told by bilingual children with TLD after 2-3 years of exposure to Hebrew are as complex as those of their monolingual peers, showing an emergent goal-oriented frame of action, expressed by language forms of similar complexity except for the use of less specific verbs among bilinguals. By contrast, bilingual and monolingual children with SLI show lower performance on expression of causal relations, particularly those involving more complex scenes with intention and motion (e.g., motivational and enabling relations). The poorer abilities of monolingual and bilingual children with SLI to causally relate between the situations in the story, particularly when this demands higher levels of linguistic complexity and content elaboration single them out. The study supports previous findings about the differences between bilingual children with TLD and monolingual children with SLI, and shows no further delay in combined bilingualism and SLI. Moreover, its methodology allows tapping onto cognitive, processing and language abilities in interaction, pinpointing vulnerable domains in bilingual acquisition and language impairment, in the communicative context of narrative production.

References

Goralnik, E. (1995). Language screening test for preschool Hebrew language speakers [in Hebrew].

PRESENTATION 3:

Story grammar elements and causal relations in the narratives of bilingual children with typically developing language and with SLI

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While there is general agreement regarding poor performance of children with Specific Language Impairment (SLI) on microstructure measures in narratives, results on macrostructure are inconsistent. The present research analyzes narrative abilities of Russian-Hebrew bilingual preschool children with and without SLI, with a particular focus on story grammar (SG) elements and causal relations. Narratives were collected from 35 typically developing bilinguals (BiTD) and 14 bilinguals with SLI (BiSLI) in both Russian/L1 and Hebrew/L2 using story retelling procedure (LITMUS-Multilingual Assessment Instrument for Narratives (Gagarina et al., 2015)). Each story contained three episodes, and each episode introduced a different protagonist with explicitly stated Goal (G), Attempt (A) and Outcome (O). Causal relations included Enabling, Physical, Motivational, and Psychological relations, following Trabasso & Nickels (1992) and Kupersmitt, Yifat, & Blum-Kulka (2014). Each Goal-Attempt-Outcome (GAO) episode was examined for the use of SG elements and causal relations. For SG elements, the two groups showed differences in the use of GAOs in both languages which emerged at the episode level: BiSLI children referred to fewer SG elements than BiTD children in the first episode, but performed like BiTD children in the second and the third episodes. For causal relations, BiSLI children produced fewer Enabling and Physical relations and these were also qualitatively different. Qualitative analysis revealed that while both groups used large numbers of mental state terms (MSTs) as linguistic manifestations of Enabling relations, narratives of children with BiSLI showed shorter clausal distance between MSTs and subsequent SG elements. For Physical relations, children with BiSLI omitted more direct objects and showed less variation in verb use. These findings show that elements of macrostructure which depend on linguistic knowledge (causal relations) are more compromised by SLI, while those that depend on knowledge of SG elements are more similar across the two populations.

References

Gagarina, N., Klop, D., Kunnari, S., Tantele, K., Välimaa, T., Balčiūnienė, I., Bohnacker, U. & Walters, J.

2015. Assessment of narrative abilities in bilingual children. In S. Armon-Lotem, J. de Jong & N. Meir (eds.) *Methods for assessing multilingual children: Disentangling bilingualism from language impairment*. Bristol, UK: Multilingual Matters, 241-276.

Kupersmitt J.R., Yifat R., & Blum Kulka S. (2014). The development of coherence and cohesion in monolingual and sequential bilingual children's narratives. *Narrative Inquiry*, 24(1), 40-76.

Trabasso, T. & Nickels, M. (1992). The development of goal plans of action in the narration of a picture story. *Discourse Processes*, 15(3), 249-275.

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PRESENTATION 4:

Narrative-embedded motion events: a developmental cross-linguistic study of German and Hebrew

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The study addresses the domain of motion in the context of narratives, focusing on the interaction between the expression of motion and more abstract levels of episodic structuring and causal relations. This is investigated in two picture-based narratives, produced by 40 German-speaking and 40 Hebrew-speaking participants (aged 5, 8 12 and adults). Analyses focused on the selection of language-particular means of establishing reference to the core motion events that frame the episodes, and on their contribution to infer causal relations between the events (Trabasso et al., 1989).

The construal of motion in terms of path, manner and causation lies at the core of the analysis. Preliminary results revealed that 5-year-old children left a large number of motion events and the goal of motion unexpressed, rendering incomplete episodes. With increasing age, children in both languages used semantically more specific motion verbs (e.g., *ziehen / limshox* 'to-pull' instead of the more general, non-motion verb *fangen / litfos* 'to-catch') and produced more sophisticated referential strategies that boosted story cohesion and coherence.

In typological terms, the motion analysis shows that German children and adults produced the typical satellite-framed pattern, conflating Manner, Cause and Path in compact constructions, with manner

verbs followed by particles and prepositional phrases to express path. While paying less attention to motion events, Hebrew speakers showed preference for path verbs and usually left manner unspecified, except for visually salient manner types, where German and Hebrew speakers differed less in linguistic expression (e.g., *ha-xatul ve ha-kelev hitgalgelu ad le-taxtit ha-giv'a* 'the cat and the dog rolled up to the bottom of the hill').

The discussion focuses on the comparison between language-specific versus universal factors in the development of narrative embedded motion, with particular attention to the construal of causal relations within a goal-oriented episodic framework.

References

Trabasso, T., van den Broek, P. W., & Suh, S. Y. (1989). Logical necessity and transitivity of causal relations in stories. *Discourse Processes*, 12, 1-25.

SYMPOSIUM

Perceptual language in child-caregiver interaction: Comparative perspectives and case studies from Australia and Papua New Guinea

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The language of perception has sparked intense debate concerning universality and cultural relativity in human cognition. Children's acquisition of 'internal state language', including perception terms (e.g., *see*, *feel*), has further been suggested to relate to the development of sociality and theory of mind. However, we know little about how such language is learnt and used by children and caregivers across languages, and how it might shape or be shaped by culture-specific practices (e.g., in regard to the dominant perceptual modalities of triadic engagement episodes, Little et al., 2016).

The goal of this symposium is to foster cross-linguistic comparison of the acquisition and use of perceptual language in child-caregiver interaction, focusing on perception verbs in longitudinal naturalistic data from under-studied languages of Papua New Guinea and Australia. Languages of this area have provided strong contributions to the literature (e.g., Evans & Wilkins, 2000), for example, concerning variation in how perception is lexicalised, and how perceptual language may interface with cultural practices and beliefs. We aim to establish a foundation for examining questions such as:

Are there universal tendencies in the acquisition of perception verbs according to modality (e.g., concerning the order of acquisition, Bloom et al., 1989)?

What are common functions of perceptual language in child-caregiver interaction (e.g., establishing joint attention, mental state attribution)?

How might differences in the lexicalisation of perception, and different grammatical properties of perception verbs impact on children's acquisition of sensory language?

Is there evidence for cultural entrainment in the way children are encouraged to attend to and talk about different perceptual experiences?

Through this symposium we hope to break new ground in comparative approaches to cross-linguistic developmental data, focusing on a semantic domain where there is high potential to see language/culture-specific influence, general cognitive predispositions, and the demands of social interaction at play.

References

Bloom, L., Rispoli, M., Gartner, B. & Hafitz, J. (1989). Acquisition of complementation. *Journal of Child Language*, 16, 101–120.

Evans, N. & Wilkins, D. (2000). In the mind's ear: The semantic extensions of perception verbs in Australian languages. *Language*, 76(3), 546–592.

Little, E. E., Carver, L. J. & Legare, C. H. (2016). Cultural variation in triadic infant-caregiver object exploration. *Child Development*, 87(4), 1130–1145.

PRESENTATION 1:

Developing comparative perspectives on perception verbs in child-caregiver interaction

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Perceptual language in child-caregiver interaction provides rich ground for cross-linguistic study, for example, concerning how children learn to appropriately share and compare private sensory experience through language. This paper identifies three research questions concerning the acquisition of perceptual language—specifically, basic perception verbs—with potential for cross-linguistic application. I report findings from a pilot study of English perception verbs, focusing on naturalistic longitudinal recordings of six children, from 1-3 or 1-4 years old, totalling ~360 hours (the Providence Corpus, Demuth, Culbertson & Alter, 2006), and including supplementary data from other corpora, diary material, and secondary sources.

Firstly, I investigate claims for a universal order of perception verb acquisition (first vision, then audition, touch, and lastly taste/smell terms). Secondly, I examine the comparative frequencies of perception verbs in child-adult interaction, and compare these with adult conversational data. Thirdly, I look at apparent cross-modal 'errors' made by children (e.g., using *hear* in reference to tactile sensation), and consider these in the context of cross-linguistic patterns of lexicalisation (Gentner & Bowerman, 2009; Viberg, 1983).

Vision verbs were among the first perception verbs recorded for all children in the Providence Corpus, but the ordering for other sensory modalities varied. Vision verbs were also comparatively more frequent in child-caregiver talk than in adult conversation, suggesting a focus on visual experience in interaction. No other single modality emerged as the second-most frequent across all children. Finally, vision verbs appeared to be more readily extended to describe non-visual perceptual experiences than the other way around. Overall, these results support a hypothesis of visual dominance in regard to the development of sensory language, but variation in regard to other modalities. Cross-linguistic testing of this hypothesis is promising, but we also face challenges of comparability in regard to recording contexts and the diverse makeup of perception lexicons across languages.

References

Demuth, K., Culbertson, J. and Alter, J. (2006). Word-minimality, epenthesis, and coda licensing in the acquisition of English. *Language & Speech*, 49, 137–174.

Gentner, D. & Bowerman, M. (2009). Why some spatial semantic categories are harder to learn than others. The Typological Prevalence Hypothesis. In J. Guoe, E. Lieven, N. Budwig, S. Ervin-Tripp, K. Nakamura & S. Özçalışkan (eds), *Crosslinguistic approaches to the psychology of language: Research in the tradition of Dan Isaac Slobin*, 465–480. New York/London: Psychology Press.

Viberg, Å. (1983). The verbs of perception: A typological study. *Linguistics*, 21, 123–162.

PRESENTATION 2:

Elevated salience of ‘touch’ references in child-caregiver interaction

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In Viberg’s salience hierarchy of the senses across languages (1983), sight is followed by hearing, followed by touch. Consistent with this, San Roque et al. (2015) found that discourse samples in diverse languages included more references to vision than to other senses. Frequency of references to other senses varied, but audition always outranked touch, as anticipated by Viberg. Since caregiver-child interaction is generally multi-modal (Gogate, Bahrack & Watson, 2000), it may be expected that frequency of sensory references in child and child-directed speech patterns differently than in adult discourse.

Building on the studies cited above, here I focus on the acquisition and use of perceptual language in the Papuan language Nungon, spoken by 1,000 peo-

ple in remote villages in Papua New Guinea. References to the senses were culled from two Nungon corpora of transcribed audio and audio-visual recordings. One corpus comprises adult speech, including dialogues and narratives; the other contains child-directed and child speech from a two-year longitudinal study of four children, 2;0-3;8, learning Nungon as a first language in a village setting.

Both corpora have markedly more references to sight than to other senses, and references to taste and smell are rare in both. The two corpora diverge with respect to references to touch. These are rare in the adult corpus, while in the child-directed and child speech corpus, references to touch actually exceed references to hearing. This reversal of hearing and touch in the child-directed and child language corpus reflects the multi-modal nature of caregivers’ interaction with small children. The elevated status of touch in this corpus confirms that interactions with children involve a different salience hierarchy of the senses than does adult discourse.

References

Gogate, L. J., Bahrack, L. E. & Watson, J. D. (2000). A study of multimodal motherese: The role of temporal synchrony between verbal labels and gestures. *Child Development*, 71, 876–892.

San Roque, L., Kendrick, K. H., Norcliffe, E., Brown, P., Defina, R., Dingemanse, M., Dirksmeyer, T., Enfield, N. J., Floyd, S., Hammond, J., Rossi, G., Tufvesson, S., van Putten, S. & Majid, A. (2015). Vision verbs dominate in conversation across cultures, but the ranking of non-visual verbs varies. *Cognitive Linguistics*, 26, 31–60.

Viberg, Å. (1983). The verbs of perception: A typological study. *Linguistics*, 21, 123–162.

PRESENTATION 3:

Learning to talk about perception in Pitjantjatjara

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Several studies have suggested a hierarchy concerning the lexicalisation of perception and the acquisition of perception verbs (e.g., Viberg, 1983). For instance, children acquiring English have been reported to acquire verbs of vision before those of other modalities (Edwards & Goodwin, 1986). However, this hierarchy might not be adhered to in all languages. Indeed, work with Australian languages suggests the auditory modality may be privileged over vision in some respects. For example, verbs of hearing, rather than seeing, are commonly extended to the cognitive domain with meanings such as ‘understand’ (Evans & Wilkins, 2000). In line with

this focus on audition, Pitjantjatjara also employs a verbaliser *-ma* specifically for sound production e.g. *nantir* 'creak' *nantir-ma-n* 'to make a creaking sound'. However, to date we have no knowledge of how such a focus on audition might play out in children's acquisition of perception terms.

In this paper, I identify basic perception verbs in Pitjantjatjara, a Pama-Nyungan language spoken in Central Australia, and examine how children acquire them. The data comes from the initial stage of a longitudinal naturalistic acquisition study following six children in Pukatja, with initial ages ranging between 1 and 3 years. Recordings of each child and their caregivers are made for at least one hour, four times a year, over three years. Pitjantjatjara makes use of three basic perception verbs: *nya* 'see', *kuli* 'hear', and *panti* 'smell'. The auditory verb *kuli* is extended to cover 'touch' as well as a range of cognitive meanings including 'think, understand, and remember'. Taste is expressed using the more general verb *arkal* 'try' often in combination with a verb of eating or drinking in a serial verb construction. This combination of simplex and complex predicates with both literal, modality-specific and extended meanings provides additional semantic and structural challenges to the child learner.

References

- Edwards, D. & Goodwin, R. (1986). Action words and pragmatic function in early language. In S. A. Kuczaj II & M. D. Barrett (eds), *The development of word meaning: Progress in cognitive development research*, 257–273. New York: Springer.
- Evans, N. & Wilkins, D. (2000). In the mind's ear: The semantic extensions of perception verbs in Australian languages. *Language*, 76(3), 546–592.
- Viberg, Å. (1983). The verbs of perception: A typological study. *Linguistics*, 21, 123–162.

PRESENTATION 4:

Perception, mental-state attribution and the acquisition of finite complement constructions

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Studies of English-speaking children by Bloom et al. (1989) and Diessel and Tomasello (2001) show that the first complement taking verbs (CTV) they learn include both verbs of perception and verbs of thought and communication, suggesting that these should be considered within a unified framework. D&T argue that in most of the children's utterances that include a finite complement clause, the matrix clause doesn't express a full proposition, instead functioning as an epistemic marker, attention get-

ter, or marker of illocutionary force. Accordingly, they distinguish among three uses of CTVs: *assertive*, *performative* and *formulaic*. Regarding the two most frequent CTVs in their data – 'think' and 'say' – D&T find that 'think' is learned earlier, with formulaic and performative uses predominating throughout their samples, while 'say' emerges later, and more frequently in assertive uses.

Replicating D&T's methodology I compare those findings with results from my acquisition study of Ku Waru, a Papuan language of Highland New Guinea. There the meanings that are expressed by most of the CTVs studied by D&T are conveyed in what looks like direct quotation, framed by the verb *nyi-* 'say', *pilyi* 'hear', or an idiomatic combination of the two that means 'think that ____'. Drawing on approximately 200 hours of longitudinal samples from children aged 1;10 – 5;2, I show that the acquisition of these CTVs differs strikingly from what D&T found for English, in that the 'say' verb is learned first, with formulaic and performative uses predominating before 3;0. In conclusion I argue that cognitivist acquisition studies that stress the importance of finite complement constructions (e.g. de Villiers & Pyers, 2002) need to attend to the differences between languages like English in which they figure centrally in the rePresentation of thought and perception, and Ku Waru where it is done in ways that look more like direct quotation.

References

- Bloom, L., Rispoli, M., Gartner, B. & Hafitz, J. (1989). Acquisition of complementation. *Journal of Child Language*, 16, 1–120.
- De Villiers, J. & Pyers, J. (2002). Complements to cognition: A longitudinal study of the relationship between complex syntax and false-belief-understanding. *Cognitive Development*, 17, 1037–1060.
- Diessel, H. & Tomasello, M. (2001). The acquisition of complement clauses in English: A corpus-based analysis. *Cognitive Linguistics*, 12, 97–141.

PRESENTATION 5:

Visual and auditory experiences in child-caregiver interaction: Insights from perception verbs in Bosavi (Kaluli)

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Studies of Indo-European languages have suggested that verbs of sight are acquired by children before other perception verbs (Bloom et al., 1989; Viberg, 1993), apparently evidencing an early focus

on visual experience. We examine child and caregiver use of sensory vocabulary in Kaluli (Bosavi), a cultural group for whom aural phenomena are very important to understanding the sensory and social world (Feld, 1982). We focus initially on the basic perception verbs *bo:ba* 'see, look' and *dabuma* 'hear, listen' in a longitudinal naturalistic corpus of 80 hours (3 children aged approximately 2;0 to 2;11, recorded approximately every 5 weeks).

All three children show spontaneous uses of the vision verb prior to the audition verb. Furthermore, while *bo:ba* is found in a rich range of contexts—even including descriptions of *non*-visual perceptual experience—*dabuma* is pragmatically restricted (e.g., 'Do you hear what I said?' following requests). However, we find that auditory experience is frequently talked about using other linguistic resources, such as deictics and ideophones. Thus, while the vision verb is often used to explicitly establish or reinforce joint attention between child and caregiver, the aural environment is available to become the focus of mutual linguistic engagement without overt reference to 'hearing'.

For the order of acquisition, frequency, and pragmatic range of use of basic perception verbs, our findings support prior claims for the primacy of vision over other modalities in child speech. However, we also see evidence that sonic phenomena (including speech and other environmental sounds) are central to the common ground of Kaluli children and their caregivers. More broadly, language use in interaction can emphasise particular characteristics of a modality, for example, through the routine linguistic encoding of vision as perceiver-oriented and audition as phenonemon-oriented. Such practices may be important in the expression and transmission of cultural ideologies of perception.

References

- Bloom, L., Rispoli, M., Gartner, B. & Hafitz, J. (1989). Acquisition of complementation. *Journal of Child Language*, 16, 101–120.
- Feld, S. (1982). *Sound and sentiment: Birds, weeping, poetics and song in Kaluli expression*. Philadelphia: University of Pennsylvania Press.
- Viberg, Å. (1993). Crosslinguistic perspectives on lexical organization and lexical progression. In K. Hyltenstam & Å. Viberg (eds), *Progression and regression in language: Sociocultural, neuropsychological and linguistic perspectives*, 340–385. Cambridge: Cambridge University Press.

PLENARY TALK

What is “complete” L1 acquisition? On the age factor in heritage language development and first language attrition

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Investigations of both the development and the ultimate proficiency in the home language of speakers who become bilingual in the period between birth and the onset of schooling tend to reveal substantial differences between such heritage speakers and monolingual natives. On the other hand, speakers who acquire a second language after around the age of twelve tend to experience rather limited (albeit quite consistent) L1 attrition effects, even in situations where the L2 becomes the main language of communication and daily life. Between these two populations there exists a substantial research gap, with very few studies investigating the development of L1 proficiency and attrition of speakers who experience language dominance reversal between school age and puberty. I will review the limited evidence on this age period and discuss it in the light of findings on heritage language development on the one hand and language attrition on the other. I argue that a more comprehensive approach to L1 development in bilinguals, encompassing a perspective of the full AoA range from birth to adulthood, can provide important insight into the nature of the bilingual language capacity.

SYMPOSIUM

Liaison acquisition: new data, models, debates

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Liaison in French is a sandhi phenomenon the functioning of which depends on factors located at different linguistic levels: phonology, morphology, lexicon, syntax. It results in the production of a consonant (LC) between two words (word1 and word2). For the LC (generally, /n/, /z/ or /t/) to appear, word2 has to begin with a vowel when produced in isolation. For instance, when the determiner *les* ([le] 'the') is combined with the noun *ours* ([urs] - 'bear'), the sequence is pronounced [lezurs]. When the LC is produced, it generally forms a syllable with the initial vowel of the word2. French liaisons are divided into two categories: categorical (always produced by all the speakers) and variable (their frequency depends on linguistic and sociolinguistic factors).

Liaison acquisition has been the subject of different studies that have led to two main theoretical interpretations of the data: the lexical model in the framework of the usage-based theory and the phonological model based on autosegmental phonology. The general aim of the proposed symposium is to bring new data from various methodologies in order to confront and discuss the two competing models with studies embedded in different theoretical frameworks.

Talk 1 presents both models and the data on which these are based. Talk 2 addresses the issue of sub-syllabic word segmentation through preferential listening tasks involving liaisons in children aged 2. Talks 3 et 4 present data on context of categorical liaison rarely studied (pronoun + verb), both in comprehension through the acquisition of subject-verb agreement in children aged 2;6 (*ils arrivent /ilzariv/* 'they come' with a /z/ plural liaison) and in production through a cross-sectional study with children aged 2 to 6. And talk 5 presents corpus analyses on liaisons used in child-directed

speech and its influence on the acquisition from the first words to 5;4.

References

Chevrot, J.-P., Dugua, C. & Fayol, M. (2009). Liaison, word segmentation and construction in French: a usage-based account, *Journal of Child Language*, 36 (3), 557-596.

Chevrot, J.-P., Dugua, C., Harnois-Delpiano, M., Siccardi, A. & Spinelli, E. (2013). Liaison acquisition: debates, critical issues, future research, *Language Sciences*, 39, 83-94.

Wauquier, S. (2009). Acquisition de la liaison en L1 et L2: stratégies phonologiques ou lexicales? *Aile*, 2: 93-130

PRESENTATION 1:

Setting the stage: Liaison acquisition, theoretical issues and available results

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The aim of the present talk is to specify the background of the symposium *Liaison acquisition: new data, models, debates*.

First, we will explain why the liaison enables us to address a general issue concerning the cognitive architecture of language. The alternation between the presence and absence of a consonant and the opacity involved by liaison are constrained in various ways by phonology, morpho-syntax, and the lexicon and by spelling, frequency, sociolinguistic cues and usage. It is the reason why the comprehension of the course of the acquisition of liaison casts lights on both the modelling of liaison in adults and the more general issues of the autonomy of the phonological knowledge and its interaction with other components of language.

We will focus on the main current debate regarding a lexical *vs* a phonological conceptualizations of liaison and their theoretical and psycholinguistic implications. Two models have been proposed. The usage-based constructionist model (CM) assumes that the acquisition of liaison is driven by generalizations across the lexicon resulting in the

formation of item-based schemas integrating different linguistic levels. The phonological model (PM) based on autosegmental phonology assumes that this acquisition reflects the ability to encode a rePresentation of liaison as a floating segment encoded at the end of the words. For the CM, the phonological knowledge emerges from the lexicon, whereas it results from a refinement of the abstract phonological rePresentations in the PM.

On the basis of a large set of various data (corpus and experiments) we will challenge the models and address the core issues they involve (e.g. continuity between children adult rePresentations, lack of evidence on the early stage and the ability to extend to other types of liaison than the prenominal one, etc.). The four following empirical talks contribute to addressing these gaps in the literature.

References

Chevrot, J.-P., Dugua, C. & Fayol, M. (2009). Liaison acquisition, word segmentation and construction in French: A usage based account. *Journal of Child Language*, 36, pp. 557-596.

Wauquier, S. & Shoemaker, E. (2013). Convergence and divergence in the acquisition of French liaison by native and non-native speakers. *Language, Interaction and Acquisition*, 4:2, pp.161-189.

PRESENTATION 2:

Uncovering the limits of sub-syllabic statistical word segmentation: The case of French liaison

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Previous studies have shown that even preverbal infants use statistical cues to segment words when the unit of statistical computation is the syllable. We investigated whether infants use statistics to segment sub-syllabic units. In French, liaison consonants are prefix-like units at the onset of vowel-initial words (e.g., /z/ in *ces amis* "these friends" [se.zami]).

We tested French-learning 24-month-olds in a preferential listening task.

In Experiment 1, infants were familiarized with sentences containing variable liaison-identical onset-consonants in pseudo-nouns (e.g., *ces zonches* "these zonches", *un nonche*, *petit tonche*). These

phrases were homophonous with real liaison phrases (e.g., *ces onches*). The low transitional probability between the VC portion of these consonant-initial nouns and the preceding materials predicted vowel-initial segmentation (e.g., *onche*). When infants were tested with the consonant-initial interpretation (e.g., 'zonche' versus a novel z-initial word), no discrimination was obtained. Infants instead showed a vowel-initial interpretation (e.g., discriminating 'onche' and a novel vowel-initial word), suggesting that they used sub-syllabic statistical cues.

In Experiment 2 familiarization sentences were the same, except that the pseudo-nouns contained unambiguous variable onset-consonants (e.g., *ces guonches*, *un vonche*, *petit chonche*). During test, infants showed a consonant-initial interpretation, but not a vowel-initial interpretation, indicating that sub-syllabic statistical segmentation does not apply generally to all consonants.

Experiment 3 further tested whether infants represent the co-occurrence of liaison consonants with specific Word1s (e.g., /n/ following *un*), i.e., whether the unit of statistical computation involved more than the liaison-consonants (e.g., *un+/n/*). Familiarization sentences contained pseudo-nouns with variable liaison-consonant-like onsets preceded by Word1s that had unmatched underlying consonants (e.g., *un zonche*, *petit ronche*). Results revealed no vowel-initial interpretation, suggesting that Word1s plus the associated liaison consonants are represented. Overall, our results demonstrate that infants are biased against sub-syllabic segmentation unless the status of the onset consonants and the preceding context allow it.

PRESENTATION 3:

The acquisition of subject-verb agreement expressed through liaison

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Recent studies of the acquisition of Subject-Verb (SV) agreement have revealed relatively late comprehension (after age 4) across different lan-

guages (e.g. Farsi, German, Spanish, Xhosa). We conducted two studies, one with real verbs and a second with pseudoverbs, to determine at what age French-learning children understand SV agreement. Although not designed to investigate the acquisition of liaison, the studies' results speak to contrasting accounts of its acquisition.

Study 1 reports evidence of comprehension (video-matching task) of SV agreement at 2;6 in 36 toddlers for familiar vowel-initial verbs that express 3rd person singular and plural agreement through /l/ linking versus /z/ categorical liaison, e.g. [i.lã.bras] it/he kisses versus [i.zã.bras] they kiss. Our corpus analyses reveal the extremely low frequency of vowel-onset verbs in input to children, particularly with singular and plural 3rd person subjects.

Study 2 evaluates the degree of productivity of this infrequent SV agreement pattern by using pseudoverbs. Results on a pointing video-matching task administered to 24 French-speaking children aged 2;6 demonstrate significant comprehension of both singular and plural SV agreement. These results do not reflect input frequency or lexically-driven knowledge (pseudoverbs). Our corpus analyses show that results are not driven by input marker reliability on its own.

French-speaking toddlers assign adult-like meaning to preverbal liaison consonants (Studies 1 and 2), including with novel verbs (Study 2). One interpretation is that toddlers' grammars include adult-like, abstract, productive morphophonological rePresentations of liaison. These early abstract rePresentations do not seem predicted by the item-based lexically-driven account of the acquisition of liaison, but they are compatible with theories emphasizing its morphophonological abstract nature at a very young age. While liaison may delay the *lexical rePresentations* of nouns, our findings suggest that preverbal liaison may facilitate the development of *morphosyntactic rePresentations*.

References

- Legendre, G., Zaroukian, E., Hsin, L., Culbertson, J., Barrière, I., & Nazzi, T. (2014). Is children's comprehension of subject-verb agreement universally late? Comparative evidence from French, English and Spanish. *Lingua*, 144, 21-39.
- Legendre, G., Barrière, I., Goyet, L., & Nazzi, T. (2010). Comprehension of infrequent subject agreement forms: Evidence from French-learning children. *Child Development*, 81(6), 1859-1875.
- Barrière, I., Goyet, L., Kresh, S., Nazzi, T., & Legendre, G. (2016) Uncovering Productive Morphosyntax in French-learning Toddlers: A Multidimensional Methodology Perspective. *Journal of Child Language*, 43 (5), 1131-1157.

PRESENTATION 4:

Liaison development in both verbal and nominal contexts in children aged 2 to 6

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The acquisition of categorical liaison is now well-documented. It supports a usage-based model that develops according to three steps: 1/ memorization and production of adult-like determiner-noun sequences including a liaison; 2/ segmentation of these sequences based on a CV pattern (e.g. *les ours* 'the bears' segmented [le.zurs]), emergence of general schemas that do not contain information about liaison ("les + /X/") and production of errors (e.g. *les ours* produced [lenurs]); 3/ generalization of specific schemas of the type "les + /zX/" and correct productions. However, these stages have been found to apply to the context «determiner + noun». In the present study, we test if this model applies to another categorical liaison context: the clitic-verb context (e.g. *ils arrivent* 'they come' [lilzariv]).

French native children (n=250) aged between 2 and 6 years old divided into 4 age-groups participated in an experimental picture naming task that elicited liaisons production in both verbal and nominal contexts.

Results show that categorical liaisons in verbal context are acquired earlier than in the nominal context and that patterns of errors in both contexts are different. Given this pattern of results, we will argue that verbal liaisons are acquired earlier because of their higher frequency in the input and the fact that weak pronouns (clitics), contrary to determiners, are used with a very limited set of words. This stability allows the memorization of frozen constructions which would not be segmented early and form the basis for correct productions. These distributional characteristics would explain the developmental advance in the mastery of verbal liaisons. Conversely, the internal composition of determiner-noun sequences is more diversified. This variability would favor an early segmentation of memorized sequences into separated units and a faster development of abstract constructions based on the first memorized ones.

References

Dugua, C., Nardy, A., Liégeois, L., Chevrot, J.-P. & Chabanal, D. (2017). L'acquisition des liaisons après les clitiques préverbaux est-elle spécifique ? Apport d'une expérimentation à grande échelle, *Journal of French Language Studies*, 27, 73-86.

Chevrot, J.-P., Dugua, C. & Fayol, M. (2009). Liaison, word segmentation and construction in French: a usage-based account, *Journal of Child Language*, 36 (3), 557-596

PRESENTATION 5:

Liaison and input: corpus studies of child-parent interactions

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This talk deals with Child-Directed Speech effects on liaison acquisition using dense corpora of child-parent interactions. Two main research questions are addressed:

a) regarding liaison usage, how can we describe what children hear? What are the lexical and phonological characteristics of liaisons addressed to children? What is the frequency of this phenomenon in CDS?

b) does the input influence the course of liaison acquisition? What is the impact of the characteristics of the CDS on liaison acquisition?

We propose a study based on about 150 hours of child-parents interactions collected in ecological context. Eight children aged between 1;0 and 5;4 were recorded at home during scenes of everyday life. Our analyses focus on the evolution of the input characteristics relative to age of children and a comparison between CDS and Adult-Directed Speech (ADS) characteristics. Our aim is to test the assumptions of the lexical and phonological approaches to liaison acquisition regarding input effects. Our main results show that liaison is a rare phenomenon for which we observe different usages between CDS and ADS and an evolution of the CDS relative to age of children. For example, variable liaisons are more often realized in CDS and lexical properties (lexical diversity after the first word involving a liaison) evolve with children's ages.

As for the link between input and language development, CDS characteristics seem to be consistent with the assumptions of the lexical approach to liai-

son acquisition: input first offers a basis for memorization of frozen constructions then CDS properties tend to foster emergency of abstract constructions based on analogies (Tomasello, 2003).

Beyond these considerations, we will discuss ecological and experimental methodologies with the goal of highlighting the main advantages as well as the limitations of the use of dense corpora for research about rare phenomena.

References

Ambridge, B., Kidd, E., Rowland, C. F., & Theakston, A. L. (2015). The ubiquity of frequency effects in first language acquisition. *Journal of Child Language*, 42(2), 239-273.

Tomasello, M. (2003). *Constructing a Language: A Usage-Based Theory of Language Acquisition*. Book (Vol. 24(1)). Cambridge: Harvard University Press.

Tomasello, M., & Stahl, D. (2004). Sampling children's spontaneous speech: how much is enough?. *Journal of Child Language*, 31, 101-121.

SYMPOSIUM

Typical and atypical pragmatic development in early childhood: Insights from parent report

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Until recently, the availability of tools to systematically elicit information from parents about children's language use in everyday, meaningful interactions was limited. The Language Use Inventory (LUI) [1], a standardized parent report developed in English (and now being adapted to other languages) has significantly filled this gap. The LUI assesses pragmatic features, including the purposes for which children 18 to 47 months old use language, their conversational topics, and how they adapt communication to context. Evidence of the LUI's reliability, validity, and sensitivity in detecting pragmatic delays [2] has contributed to its widespread adoption in practice [e.g., 3].

The symposium's goal is to present findings from three research teams that have used the LUI to better understand pragmatics in various groups of children. The first study examined the pragmatic abilities of English-speaking children longitudinally, between the ages of 24 and 36 months. The Presentation highlights the trajectories of children scoring low at 24 months and gender differences in growth patterns. The second study similarly addressed change over time, but for English-speaking children with various disabilities receiving intervention for communication delays. This study examined the LUI's use in monitoring children's progress and engaging parents in collaborative planning and the relationship of LUI scores to performance on other language measures. The third study provides cross-sectional data for children 18 to 47 months old, gathered with the Canadian-French LUI. The effects of age and gender are reported, along with data on the measure's reliability and comparability to the original LUI. These data inform the fourth study on the pragmatic abilities of French-speaking children who have been formally identified as "neglected", compared to children with no known risk for language or developmental delay. Collectively,

the studies underscore the importance of parents in understanding young children's pragmatic abilities at one or successive points in time.

References

[1] O'Neill, D. K. (2009). *Language Use Inventory (LUI): An assessment of young children's pragmatic language development*. Waterloo, ON, Canada: Knowledge in Development, Inc.

[2] Pesco, D., & O'Neill, D. K. (2012). Predicting language outcomes from early pragmatics assessed by the Language Use Inventory. *Journal of Speech, Language, and Hearing Research*, 55, 421-434.

[3] Tager-Flusberg, H., Rogers, S., Cooper, J., Landa, R., Lord, C., Paul, R., ... Yoder, P. (2009). Defining spoken language benchmarks and selecting measures of expressive language development for young children with autism spectrum disorders. *Journal of Speech, Language, and Hearing Research*, 52, 643-652.

PRESENTATION 1:

Growth in pragmatic language from 24-36 months: A longitudinal study using the Language Use Inventory

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Introduction. Longitudinal studies of children's language development are essential for providing a better understanding of growth trajectories that represent normal variation and the potential for positive outcomes despite lower initial functioning, and those that should be regarded as clinically significant [1]. This study investigated growth in pragmatic language ability for 138 children (67 girls/71 boys) assessed at 3-month intervals from ages 24 to 36 months using the Language Use Inventory (LUI), a standardized parent-report measure [2, 3]. Thirty-three percent of mothers had education levels lower than university.

Methods and Results. Latent growth curve analyses of children's LUI Total Score revealed a significantly lower "onset" score at 24 months (Time 1) for boys, followed by significantly faster growth compared to girls. We also examined the growth of children's scores relative to their LUI percentile score at Time 1, categorized into one of six percentile groups (0-16th; 17th-33rd; 34th-49th; 50th-66th; 67th-84th; 85th-99th). Children's growth rate from Time 1 (24 months) to Time 5 (36 months) and their scores at Time 5 varied significantly among these six groups. Notably, among children in the 0-16th percentile at Time 1, nearly half performed below the 34th per-

centile at Time 5, compared to 0-6% in all other groups. Correlational analyses revealed that children's successive percentile scores (Time 1-Time 2, Time 2-Time 3, etc.) were significantly and uniformly highly-correlated for both girls and boys ($r > .81$). However, there was greater variability in girls' growth. For example, the correlation between Time 1 and Time 5 percentile scores was .72 for boys, but .53 for girls. Conclusion. Our findings contribute to a fuller understanding of the range of variability in growth trajectories of 2-year-olds' early language use in order to help identify children whose trajectories suggest possible delay or impairment and the need for in-depth assessment and monitoring.

References

Karmiloff-Smith, A. (1998). Development itself is the key to understanding developmental disorders. *Trends in Cognitive Sciences*, 2, 389-398.

O'Neill, D. K. (2007). The Language Use Inventory for Young Children: A parent-report measure of pragmatic language development for 18- to 47-month-old children. *Journal of Speech, Language, and Hearing Research*, 50, 214-228.

O'Neill, D. K. (2009). Language Use Inventory (LUI): An assessment of young children's pragmatic language development. Waterloo, ON, Canada: Knowledge in Development, Inc.

PRESENTATION 2:

Using the LUI with children with multisystem disabilities

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Introduction. Family-centered practice for children with disabilities depends on clinicians understanding parents' perceptions of their children's communication, an area of language that is difficult to assess across time and contexts. This study explored the validity of the Language Use Inventory [1] for use with children with significant language delays through comparing parents' responses on this measure when administered concurrently with two other parent questionnaires addressing communication development.

Methods. The parents of 65 children aged between 29 and 67 months with multi-system disabilities completed three questionnaires in their own time at home between 1 and 6 times with a minimum of six months between each completion. All the children were attending the same early intervention

program in New Zealand. Parents completed the Language Use Inventory, the vocabulary subscale of the MacArthur-Bates Communicative Development Inventory [2], and the Communication subscale of the Adaptive Behavior Assessment System [3]. The use of these three measures allowed cross-referencing of parents' reflections across 22 items and also opportunities to examine the evolution of language use for those children whose parents completed the questionnaires at multiple time-points. Results. Results suggested strong correlations between measures ($>.8$, $p = 0.01$) and high levels of consistency (93%) of parental observation across 22 points identical across the measures. Conclusion. Parent report on the LUI accords well with reports on other parent report measures and provides support for using the LUI as a general measure of language use with children with developmental disabilities and language delays. Case study data from within the cohort also suggested that repeated administration of the same combination of questionnaires over time provides information on the development of language use that clinicians can use for collaborative goal setting and program planning with parents.

References

O'Neill, D. K. (2009). Language Use Inventory (LUI): An assessment of young children's pragmatic language development. Waterloo, ON, Canada: Knowledge in Development, Inc.

Reese, E., & Read, S. (2000). Predictive validity of the New Zealand MacArthur Communicative Development Inventory: Words and sentences. *Journal of Child Language*, 27(2), 255-266.

Harrison, P. L., & Oakland, T. (2000). ABAS, Adaptive Behavior Assessment System: Manual. San Antonio, TX.: Psychological Corporation.

PRESENTATION 3:

A parent report of the pragmatic abilities of French-speaking toddlers and preschoolers: Validation of the Canadian-French version of the Language Use Inventory

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Introduction. Given that parents have opportunities to observe their children across a wide range of contexts, they are potentially a rich source of information about children's early language use. Yet, there are no standardized, norm-referenced parent reports with a pragmatic focus available to assess young French-speaking children in Quebec [1] or Canada. We aimed to (a) adapt an existing parent

report, the Language Inventory (LUI) [2] to Canadian French, using best practices of forward translation and multiple reviews, and (b) assess the LUI-French in terms of its developmental sensitivity, reliability, and subscale order [3].

Methods. Individuals with relevant expertise contributed to the translation/adaptation of the LUI-French, including speech-language pathologists and parents. Parents of children exposed primarily to French ($\geq 80\%$ of the time) completed the LUI-French when their child was 18, 24, 30, 36, 42, or 47 months old. A total of 234 questionnaires (115 girls, 119 boys) were collected, with a range of 30-54 participants per age group. **Results.** ANOVA revealed a main effect of age group on the LUI-French Total Score. Follow-up tests showed scores increased with age and girls scored higher at younger ages. Positive correlations were also found between age and subscale scores, with coefficients ranging from .60 to .82, $p < .0005$. The subscales also demonstrated good to excellent internal reliability, with Cronbach's alpha ranging from .86 to .99 for 8/10 subscales, and .73-.76 for the remaining two. Additionally, factor analysis supported the ordering of the LUI subscales. **Conclusion.** This first study of the LUI-French showed that it is developmentally sensitive and reliable, and findings additionally supported the subscale order. The results indicate that it is appropriate to proceed to norming the LUI-French for clinical use. The LUI-French can also be applied currently in research contexts to ascertain and describe early pragmatic abilities.

References

Monetta, L., Desmarais, C., MacLeod, A. A. N., St-Pierre, M.-C., Bourgeois-Marcotte, J., & Perron, M. (2016). Recension des outils franco-québécois pour l'évaluation des troubles du langage et de la parole. *Revue canadienne d'orthophonie et d'audiologie*, 40(2), 165-175.

O'Neill, D. K. (2009). *Language Use Inventory (LUI): An assessment of young children's pragmatic language development*. Waterloo, ON, Canada: Knowledge in Development, Inc.

Pesco, D., & O'Neill, D. (2016). Assessing early language use by French-Speaking Canadian children: Introducing the LUI-French. *Canadian Journal of Speech-Language Pathology and Audiology*, 40(3), 198-217.

PRESENTATION 4:

Parental neglect and language development: A look at the pragmatic development of neglected three-year-olds

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Introduction. Parental neglect is defined by the failure of a parent to respond to the fundamental needs of their child. The devastating effects of neglect on language development are well known [1]. Pragmatic language development (social use of language) is likely to be compromised in contexts of neglect since it depends on the interactions between the child and people in his or her immediate environment [2]. Such interactions are, by definition, severely disturbed in cases of parental negligence. The objectives of the present study were (a) to establish the prevalence of pragmatic deficits amongst neglected children aged 3.5 years old and (b) to compare the diversity of neglected children's communicative intents to that of their non-neglected peers.

Methods. This study compared two groups of children at 3.5 years of age: 45 neglected and 93 non-neglected children. Ten dimensions of pragmatic abilities (e.g., the child's conversation with others, sense of humour, and comments about themselves) were examined using the LUI-French [3], administered to parents during an interview. The variety of communicative intents produced by the child was also examined through direct observation of a semi-structured play session designed to elicit 14 different communicative intents.

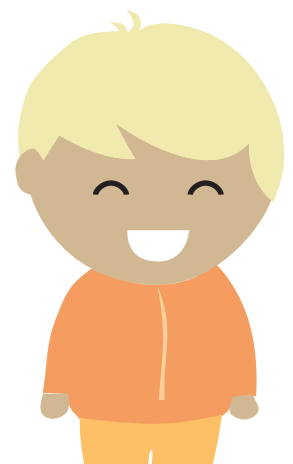
Results. Neglected children had significantly lower scores on the LUI-French than the non-neglected children ($p < .0001$) and the effect size was large, Glass's $\Delta = 2.53$). The two groups were widely divergent in their scores on the majority of LUI subscales. Neglected children also produced communicative intents that were less diverse and complex than those of their non-neglected peers. **Conclusion.** The results to date suggest that pragmatic skills should be a primary objective in interventions to foster the language of neglected children. Ways of supporting specific aspects of pragmatics in order to support children's social participation will be discussed.

References

Spratt, E. G., Fau, F. S., Swenson, C. C., Larosa, A., Fau, L. A., De Bellis, M. D., Brady, K. T. (2012). The effects of early neglect on cognitive, language, and behavioral functioning in childhood. *Psychology*, 3(2), 175-182.

Lacharité, C., Éthier, L. S., & Nolin, P. (2006). Vers une théorie écosystémique de la négligence envers les enfants. *Bulletin de psychologie*, 59(4), 381-394.

Pesco, D., & O'Neill, D. (2016). Assessing early language use by French-speaking Canadian children: Introducing the LUI-French. *Canadian Journal of Speech-Language Pathology and Audiology*, 40(3), 198-217.



SYMPOSIUM

The language of schooling: evidences for new relations with literacy and language development

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In today's information-based society where large proportions of adolescents do not understand what they read, beyond code-focused skills, academic language skills have gained attention as a promising malleable skillset that, if expanded, can lead to improved text comprehension (LeVine, LeVine, Schnell-Anzola, Rowe & Dexter, 2012; Snow, 2010). Despite awareness of the relevance of academic language proficiency, the construct has remained imprecisely delineated. Taking advantage of a recent conceptualization of a cross-disciplinary construct, the Core Academic Language Skills (CALs), the proposed studies focuses on investigating the development of CALs and its associations with academic reading, writing and learning. CALs is defined as high-utility language skills concerned to discursive and linguistic predominant resources in school-related genres and infrequent in colloquial interactions (e.g., logical connectives, nominalizations) (Uccelli, Phillips Galloway, Barr, Meneses, & Dobbs, 2015).

Recent research –conducted with English and Spanish-speaking participants– has demonstrated that CALs significantly predicts mid-adolescents' reading comprehension beyond decoding, vocabulary, and socio-demographic factors. The proposed studies advance by focusing on areas minimally explored: (1) developmental trajectories of CALs; (2) precursors of CALs development; (3) contributions of CALs to science learning; and (4) contribution of CALs to academic writing.

The first paper examines the developmental of academic language and reading comprehension in one year of middle school. The findings suggest the concurrent developmental pattern of these skills and the prediction of initial CALs in the growth

rates of reading comprehension. The second paper addresses the significant prediction of children's decontextualized talk at 30 months in CALs in 7th graders focusing on the types of parent-child activities that promote this type of talk. The third paper deals with the prediction of CALs in Science highlighting CALs' contribution to 4th graders' subject-matter learning. The fourth paper examines the relation between academic language and the quality of writing in school-genres showing the positive contribution of CALs to the quality of explanation and argumentation produced by 8th graders.

References

Uccelli, P., Phillips Galloway, E., Barr, C., Meneses, A., & Dobbs, C. (2015). Beyond vocabulary: Exploring cross-disciplinary academic-language proficiency and its association with reading comprehension. *Reading Research Quarterly*, 50(3), 337-356. doi:10.1002/rrq.104

LeVine, R. A., LeVine, S., Schnell-Anzola, B., Rowe, M., & Dexter, E. (2012). *Literacy and mothering: How women's schooling changes the lives of the world's children*. New York, NY: Oxford University Press.

Snow, C. (2010). Academic language and the challenge of reading for learning about science. *Science*, 328(5977), 450-452. doi: 10.1126/science.1182597

PRESENTATION 1:

Mapping academic language skills and reading comprehension development in middle grade populations

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This study investigates developmental relations between school-relevant English language proficiency and reading comprehension in a longitudinal sample of early adolescents. Drawing from the Simple View of Reading (SVR) model, reading comprehension is operationalized as the mathematical product of decoding and language comprehension (Gough & Tunmer, 1986). Recent theoretical models call for the addition of academic language skills to the SVR as a predictor of adolescent reading comprehension (LaRusso, et al., 2016; Uccelli, Phillips Galloway, Barr, Meneses, & Dobbs, 2015); yet few studies explore this relation across development. This study focuses on *Core Academic Language Skills* (CALs). Our primary objective was to examine whether 6th-grade students' initial CALs levels or their CALs rate of growth were predictive of 7th-grade reading comprehension after controlling for baseline vocabulary knowledge, word recognition

skills, reading comprehension, and socio-demographic covariates (socio-economic status, English Learner status and special education eligibility) (n=833). A parallel process latent growth modeling which demonstrated good model fit was fit to the data ($\chi^2(30) = 182.503$, $p=0.00$, $CFI=0.97$, $TLI=0.95$, $RMSEA=0.08$ (90% $CI=0.07-0.09$), $SRMR=0.03$). Results indicate that academic language and reading comprehension skills develop concurrently, with rapid growth in CALS associated with rapid growth in reading comprehension skills. Furthermore, initial levels of CALS predict rates of growth in reading comprehension. Mirroring the results of studies on vocabulary development in middle graders, this study finds that academic language follows a similar developmental pattern, with considerable individual variability even within grade. To our knowledge, this is the first study to directly test developmental relations between academic language proficiency and reading comprehension in the middle school years. From a theoretical perspective, this study contributes to expand the existing Simple View of Reading model by identifying academic language proficiency as one of the skillsets worth investigating within the larger and unspecified language comprehension component. Results also highlight the potential for CALS-focused instruction as a point of leverage for improving early-adolescent learners' reading comprehension outcomes.

References

Uccelli, P., Phillips Galloway, E., Barr, C., Meneses, A., & Dobbs, C. (2015). Beyond vocabulary: Exploring cross-disciplinary academic-language proficiency and its association with reading comprehension. *Reading Research Quarterly*, 50(3), 337-356. doi:10.1002/rrq.104

Gough, P. B., & Tunmer, W. E. (1986). Decoding, reading, and reading disability. *Remedial and special education*, 7(1), 6-10. doi:10.1177/074193258600700104

LaRusso, M., Kim, H. Y., Selman, R., Uccelli, P., Dawson, T., Jones, S., Snow, C. (2016). Contributions of academic language, perspective taking, and complex reasoning to deep reading comprehension. *Journal of Research on Educational Effectiveness*, 9(2), 201-222. doi:10.1080/19345747.2015.1116035

PRESENTATION 2:

Children's decontextualized talk predicts academic language skills in mid-adolescence

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This study examines whether children's production of decontextualized talk at 30 months predicts 7th-grade academic language (AL) proficiency (age 12). Decontextualized talk is defined as extended discourse removed from the surrounding physical context of the interaction and focused on the there-and-then, i.e., narratives, explanations, pretend (Ninio & Snow, 1996). AL refers to the language of academic texts (Halliday, 2004), which we operationalized as Core Academic Language Skills (CALS) (Uccelli, Phillips Galloway, Barr, Meneses, & Dobbs, 2015). Whereas child's decontextualized talk is studied as predictor of early discourse development, its relation to later language outcomes remains understudied. AL proficiency has been identified as a significant predictor of adolescent text comprehension; yet, research on precursors to AL proficiency is scarce. Drawn from a larger Chicago-based project on language development (U.S.A.), 42 typically-developing children and their parents participated in this study. At 30 months, children were videotaped during spontaneous interactions with their parents at home for 90 minutes. After transcription, parents' and children's decontextualized utterances were identified and coded as narrative, pretend, or explanation. Children were administered a standardized receptive vocabulary and a syntax comprehension test at 30-months and the CALS Instrument in 7th grade. Results revealed that the proportion of child decontextualized talk at 30 months was a significant predictor of 7th-grade academic language proficiency, even after controlling for socioeconomic status, parent decontextualized talk, child total words, child vocabulary and child syntactic comprehension. To our knowledge, this is the first study to examine children's decontextualized language at 30 months as precursor to mid-adolescence AL proficiency. Interestingly, beyond parental input, the child's own production of a particular type of talk, decontextualized talk, was the stronger predictor. Results suggest that, beyond the current focus on early vocabulary interventions, more naturalistic approaches that promote parent-child shared narratives, pretend, and explanations seem particularly promising.

References

Uccelli, P., Phillips Galloway, E., Barr, C., Meneses, A., & Dobbs, C. (2015). Beyond vocabulary: Exploring cross-disciplinary academic-language proficiency and its association with reading comprehension. *Reading Research Quarterly*, 50(3), 337-356. doi:10.1002/rrq.104

Halliday, M.A.K. (2004). *Collected works of M.A.K. Halliday*. Vol. 5: The language of science (J.J. Webster, Ed.). New York, NY: Continuum.

Ninio, A. & Snow, C. E. (1996). *Pragmatic Development*. Boulder, CO: Westview Press.

PRESENTATION 3:**Spanish academic language, reading comprehension and science learning in 4th Chilean graders**

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Prior research has documented the important contribution of academic language proficiency to reading comprehension for Spanish-speaking early adolescents (grades 4 to 8) (Meneses et al., 2016), yet research on the role academic language skills play in subject-matter learning in Spanish-speaking students is still minimal. Indeed, academic language skills have been considered a key factor in facing the challenge of disciplinary reading comprehension (Snow, 2010). However, the relation between the language of schooling and subject learning has not been explored. This paper strives to understand the specific contribution of academic language to reading comprehension and science learning. A total of 160 4th graders attending to three urban schools in Santiago (Chile) participated in this study.

Five assessments were administered: (1) *Spanish CALS* ($\alpha=.88$); (2) *Academic Vocabulary Knowledge* ($\alpha=.80$); (3) *Spanish Reading Comprehension* ($\alpha=.82$) with two expository texts for reading; (4) *Word Reading Fluency* (Spanish RWS); and (5) *Science Learning Test* ($\alpha=.87$) to assess science content knowledge and skills aligned with the Chilean Science Curriculum for 4th graders.

The results revealed Spanish CALS' positive and significant correlations with reading comprehension ($r=.56$, $p<.000$), science learning ($r=.66$, $p<.000$), academic vocabulary ($r=.72$, $p<.000$), and reading fluency ($r=.44$, $p<.000$). The regression models to predict reading comprehension show that the addition of Spanish CALS resulted in an R-square increase of 12.9% after adding gender, type of school, and reading fluency, with a total of 38% of variance explained. However, when the regression models predict science learning, the addition of Spanish CALS resulted in 14% R-square increased with a total of 59% of variance explained in science learning. These results suggest that CALS not only contributes to reading comprehension, but is also a key factor in subject-matter learning. This study suggests that, the achievement of disciplinary literacy involves specific language for learning in addition to reading and writing practices.

References

- Meneses, A., Uccelli, P. Santelices, M., Ruiz, M., Acevedo, D., & Figueroa, J. (2018). Academic language as a predictor of reading comprehension in monolingual Spanish-speaking readers: Evidence from Chilean early adolescents. *Reading Research Quarterly*, 53(2). doi: 10.1002/rrq.192
- Snow, C. (2010). Academic language and the challenge of reading for learning about science. *Science*, 328(5977), 450-452. doi: 10.1126/science.1182597

PRESENTATION 4:**Explanation and argumentation genres at school: writing quality and academic language in 8th Chilean graders**

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Writing is a task that involves a high cognitive and linguistic demand. The difficulty is increased for writing academic texts; therefore, students need to learn to use language to produce different discursive genres (Ravid & Tolchinsky, 2002). Theoretically, however, one of the factors that can affect the quality of written texts is academic language (Schleppegrell, 2004; Snow & Uccelli, 2009). The purpose of this Presentation is to determine whether academic language skills—specific measures in the *Spanish Core Academic Language Skills* (CALS) and academic vocabulary— predicts the quality of the writing of explanations and argumentation produced by 8th graders. 126 Chilean 8th graders in three schools with high, medium, and low socioeconomic levels produced explanations and argumentations on the same topic (*the use of Tablet*), and were evaluated on their key academic language skills using *Spanish CALS* ($\alpha=.88$) and their academic vocabulary using S-AVoc-T ($\alpha=.80$). To assess the quality of writing a rubric was developed and validated ($\alpha = .66$) and includes four levels of achievement (*not achieved, basic, achieved and prominent*). The results reveal that writing students have basic levels of achievement in both discursive genres. Likewise, the results reveal Spanish CALS' positive and significant correlations with writing task involving explanations ($r=.59$, $p<.000$) and argumentation ($r=.51$, $p<.000$). The regression models to predict writing show that- after performing a Principal Component Analysis (PCA)- the models that best explain the writing quality are those that bring together both language variables: S-CALVS. In explanations, S-CALVS accounts for 35% of the variance explained. Moreover, argumentation only

explains 29% of the variance, after controlling for gender. These results suggest that S-CALVS contributes to writing. Therefore, it is important to develop academic language skills in school, because this favorable impact on writing academic texts.

References

Ravid, D. & Tolchinsky, L. (2002). Developing linguistic literacy: a comprehensive model. *Journal of Child Language* 29(2), 419–48. doi: 10.1017/S0305000902005111

Schleppegrell, M. J. (2004). *The language of schooling: a functional linguistic perspective*. London: Lawrence Erlbaum Associates.

Snow, C., & Uccelli, P. (2009). The challenge of academic language. In D. R. Olson & N. Torrance (Eds.), *The Cambridge handbook of literacy* (pp. 112–133). Cambridge, UK: Cambridge University Press.

DAY
5

FRIDAY, 21ST

11:00-13:00,

AMPHI JEAN-BAPTISTE SAY

SYMPOSIUM

Lexical properties that bootstrap infant word learning

CONVENER: Mitsuhiro Ota, University of Edinburgh, U.K., mits@ling.ed.ac.uk

During word learning, infants face two major inductive problems. First, they need to segment word forms from running speech, and second, they need to identify the semantic referents of the word forms. As research in the past few decades has shown, these challenges can be overcome by a range of general learning abilities and biases that infants bring to the task, such as the use of transitional probabilities to identify word boundaries and heuristics that constrain the potential meanings of words (e.g., the whole-object assumption).

Recent research points to another type of mechanism that may contribute to this process: Certain lexical items may be inherently more segmentable, learnable or producible, and thus serve as a gateway into word learning. In support of this hypothesis, there is evidence that words are easier to detect and/or learn when they have iconic or sound-symbolic form-meaning mappings, phonologically less variant endings, repeated phonological structures or forms that match infants' articulatory capacities. It has also been observed that the register-specific vocabulary addressed to infants typically contains a disproportionate number of words featuring such characteristics (e.g., onomatopoeia, diminutives, and reduplication), potentially providing a linguistic environment that scaffolds infants' word learning.

However, many questions remain unanswered for the notion that early lexical development is bootstrapped by certain types of words. What evidence can be brought to bear on the facilitative effects of such words? Through what mechanisms can the acquisition of a small set of words lead to broader lexical development? Do the characteristics of infant-directed vocabulary reflect these putative learning biases? If so, what evolutionary processes have given rise to the correspondence? The aim of this symposium is to bring together recent work that addresses these questions and to shed new light on the possibility that lexical items that carry certain features can bootstrap word learning.

PRESENTATION 1:

Sound symbolism bootstraps language development: Studies on infant word learning and on parental input

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We examined whether sound symbolism bootstraps infant word learning in four studies. Sound symbolism refers to inherent sound-meaning relationships. For example, "moma" is a better label for round objects than "kipi", which is a better label for spikey objects (Köhler, 1929). Such shape sound symbolism was used in Studies 1 and 2. Study 1 investigated whether sound symbolic words are learned more easily. Thirty-four Japanese-learning 14-month-olds were habituated to two word-object pairs. Half of the infants were exposed to sound symbolically congruent pairs and the other half to incongruent pairs. Infants in the congruent condition learned the two word-object pairs better than infants in the incongruent condition. Study 2 investigated whether pre-exposure to sound symbolically congruent stimuli primes infants to learn non-sound symbolic 'difficult' word-object pairs (difficult because the words were phonotactically illegal in English, e.g., "ptak"). Thirty-two English-learning 12-to-14-month-olds were first exposed to four word-shape pairs (the primes). Half of the infants were exposed to sound symbolically congruent pairs and the other half to incongruent pairs. Next, they were habituated to two "difficult" word-object pairs. The infants in the congruent condition learned the two word-object pairs, but those in the incongruent condition did not.

Do mothers use sound symbolism more in CDS (child-directed speech) than in ADS (adult-directed)? In Study 3, Japanese mothers described short vignettes of everyday activity to 2-3 year olds and to adults. The mothers used more (conventional) sound symbolic words for actions in CDS. In Study 4, British mothers described either a small or large object with a novel label to 14-18-month olds and to adults. Preliminary results show that CDS exhibited stronger pitch-size sound symbolism (e.g., a higher pitch for the smaller object; Ohala, 1994).

Thus, sound symbolism helps infant learn words, and mothers enhance sound symbolism in CDS presumably to help their infants.

References

- Köhler, W. (1929). *Gestalt psychology*. New York: Liveright Publishing Corporation.
- Ohala, J. J. (1994). The frequency code underlies the sound-symbolic use of voice pitch. In L. Hinton, J. Nichols, & J. J. Ohala (Eds.), *Sound symbolism* (pp. 325-347). Cambridge: Cambridge University Press.

PRESENTATION 2:

Producibility and accuracy in early acquisition: The case for onomatopoeia

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In relation to their frequency in adult language, young infants tend to produce a disproportionate number of onomatopoeia. Researchers have proposed motivations spanning from an iconic bootstrapping advantage (Vigliocco et al., 2014) to pragmatic or prosodic salience in the input (Kunnari, 2002). To-date, however, little empirical research has been done to investigate this aspect of the early output. In this paper, I demonstrate an advantage for onomatopoeia in early production, highlighting how they are particularly suited to early phonological development.

The first words of 15 infants acquiring six different languages were analyzed. First, the data were considered exclusive of onomatopoeia. Prominent production patterns, including consonant harmony and open CV syllables, were identified to determine whether the infants' lexical development was driven by systematicity. A pattern was considered to be prominent if it accounted for $\geq 10\%$ of an infant's data (termed 'OWN' structures). Overall, infant production was highly systematic, with OWN structures (including consonant harmony, CV syllables, VCV structures) accounting for a significant proportion of the data ($M = .75$, $SD = .13$, $\chi^2(1) = 45.89$, $p < .000$). When onomatopoeia were included in the analysis, overall proportion of OWN structures remained the same ($M = .75$, $SD = .12$). Two production patterns – consonant harmony/reduplication and CV syllables – were particularly dominant across the data, accounting for 60% of all structure-matching words. Further analysis showed onomatopoeia to be produced with one of these two structures in 70% of cases ($SD = .2$). Furthermore, 61% of all onomatopoeia were produced accurately, said to be 'selected' to fit the infants' preferred patterns ($SD = .16$). In contrast, only 37% of non-onomatopoeia were produced accurately ($SD = .09$).

These results present a new perspective on onomatopoeia, highlighting their role in early produc-

tion. In earliest lexical acquisition, infants target words that are producible, said to be 'selected' in line with phonological abilities. This facilitates the task of memorizing and planning, as well as producing, words (Vihman, 2016). The phonological characteristics of onomatopoeia – often simple CV forms or reduplicated syllables – make them ideal targets for infants whose linguistic capacity is limited, allowing accurate production within a constrained phonological system.

References

- Kunnari, S. (2002). Word length in syllables: evidence from early word production in Finnish. *First language*, 22(2), 119-135.
- Vigliocco, G., Perniss, P., & Vinson, D. (2014). Language as a multimodal phenomenon: implications for language learning, processing and evolution. *Philosophical Transactions of the Royal Society B*, 369(1651), 20130292.
- Vihman, M. (2016). Prosodic structures and templates in bilingual phonological development. *Bilingualism: Language and cognition*, 19(1), 69-88.

PRESENTATION 3:

Testing bootstrapping effects of infant-directed vocabulary: A longitudinal analysis

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Infant-directed speech contains a substantial number of lexical items characterized by sound-symbolism or onomatopoeia (e.g., *moo*, *choochoo*), full/partial reduplication (e.g., *night-night*, *daddy*), and diminutives (e.g., *doggy*, *blankie*). It has been proposed that such register-specific words are easily-acquired and facilitative of further vocabulary acquisition because of their iconic sound-meaning mappings (sound-symbolic words; Vigliocco, Perniss, & Vinson, 2014), phonological repetition (reduplication; Gervain & Werker, 2008), and regularity in prosodic and word-edge patterns (diminutives; Jusczyk, 1997). If this is true, we expect initial vocabulary growth to be boosted in infants whose lexical input has a higher incidence of such characteristics.

To test this prediction, we examined samples of natural speech addressed to 47 English-learning infants and their vocabulary growth measured through CDI reports obtained from the same infants. The predictor variables included token-based proportions of the lexical items in the 9-month input containing 1) sound-symbolism (e.g., *moo*, *neenaw*, *choochoo*), 2) reduplication, or words consisting of (a set of) syllables that are either identical or dif-

ferent only by the onset or rhyme (e.g., *night-night*, *tick-tock*, *teeny-weeny*), 3) CVCi – initially-stressed disyllabic words ending in /i/ (e.g., *daddy*, *bunny*, *doggie*). The outcome measures were the total sizes of receptive and productive vocabularies at 9, 15 and 21 months, but without counting words with the predictor features. Analysis using mixed-effects growth models showed that sound-symbolism was not related to the outcome measures, but the proportions of reduplicated and CVCi words both contributed significantly to variance in infants' receptive and productive vocabulary growth.

These findings suggest that at least lexical input with repeated sound patterns, invariant endings and regular prosodic structure facilitates the acquisition of other words in the input during this period. This bootstrapping effect provides one possible explanation for why register-specific lexical items in infant-directed speech exhibit common form characteristics such as reduplication and diminutives.

References

Gervain, J., & Werker, J. F. (2008). How infant speech perception contributes to language acquisition. *Language and Linguistics Compass*, 2(6), 1149-1170.

Jusczyk, P. W. (1997). *The discovery of spoken language*. Cambridge, MA: MIT Press.

Vigliocco, G., Perniss, P., & Vinson, D. (2014). Language as a multimodal phenomenon: implications for language learning, processing and evolution. *Philosophical Transactions of the Royal Society B*, 369(1651), 20130292.

DISCUSSION:

Linking learning and teaching biases in word learning and beyond

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In my brief discussion remarks, I will summarise the presented results with respect to whether they provide evidence for learning biases or for teaching biases in the domain of word learning. I will then suggest some ways in which we can investigate to what extent teaching biases observed in child-directed speech reflect word-learning biases, and how we can advance the systematic study of the nature and strength of the link between these two sets of biases. This will include discussion of experimental approaches that aim for a more controlled elicitation of child-directed speech under different conditions. I will then invite audience discussion of possible proximal and distal mechanisms that may drive co-evolution of learning and teaching biases not just in word learning but also across other domains.

SYMPOSIUM

Grammatical Generalizations: How Input Structure Influences Language Learning

CONVENER: Amanda J. Owen Van Horne, University of Iowa, U.S.A, ajovh@iui.edu
DISCUSSANT: Evan Kidd, Australian National University, Australia, evan.kidd@anu.edu.au

The structure of the input is an influential element in language learning, and identifying the types of structures that make learning easier is important both for elucidating the mechanisms involved in typical language acquisition, and for providing targets for intervention in language-learning impaired populations. The goal of this symposium is to address the key question of how different elements of input structure influence both learning and generalization of morphological forms. In line with the symposium's special emphasis on the lifespan perspective, we draw together a set of studies that assess grammar learning with typically developing children and adults and children with language-learning impairment.

Prior work on word learning has suggested that increased variability (increased types) and increased practice (increased tokens) both enhance learning, albeit in different ways. Extension of these principles to grammar learning is complicated by how one defines a type and a token and the many ways that input can be organized for the learner. Each talk examines an aspect of how the number and variety of exemplars used during training in artificial or natural languages affects the ability of participants to learn the target morpheme. Three of the studies provide highly controlled experimental manipulations of type/token ratios, while the fourth study extends this work to the principles of how targets should be selected for treatment in a therapy study. All studies demonstrate that input structure is a key determinant of learning and generalization, but that additionally factors unrelated to the input distribution play a role. These include the age of the participants, the engagement of the language production vs. comprehension system, and memory consolidation processes. The discussant will

draw together themes of the work as it relates to the broader literature on language learning and individual differences.

PRESENTATION 1:

Variable input and language production enhance learning and generalization of novel grammar

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The current study uses an artificial grammar learning approach, to examine the learning of novel grammatical categories in typically developing 10-year-old children, and adults. Previous research has shown that both adults and children use phonological and distributional regularities to abstract grammatical categories (e.g. Monaghan et al., 2005), and some studies have examined the role of semantic cues (e.g. Braine, 1987). Here we use an artificial language with a morphological system modeled on grammatical gender, which combines semantic, phonological, and distributional cues.

In Study 1, we examined the influence of variability in the training set. In line with the literature (e.g. Gomez, 2002) we predicted that increasing the number of exemplars to be learnt in each of the two trained categories would enhance individuals' ability to extract the common grammatical morphemes indicating category membership, and generalize them to novel items. The results showed that – regardless of the size of the training set – both adults and 10-year-old children were able to learn novel vocabulary items, but only adults showed evidence of abstracting the grammatical regularities in the input. In adults only, higher variability enhanced generalization, in that it enabled participants to extract more elements of the morphology (both determiner and suffix, rather than only the determiner as in the low-variability condition).

In Study 2, we changed the training procedure to include language production, compared to a comprehension-only condition, and predicted that this would enhance learning of the sequential regularities in the language. Preliminary data are in line with this prediction: although item-level learning was similar in the two training conditions, only the language production training condition produced generalization to novel items in children. We propose that the engagement of the language production system facilitates the extraction of sequential regularities in the input that can then be generalized to novel situations.

References

Braine, M. D. S. (1987). What is learned in acquiring word classes - a step toward an acquisition theory. In B. MacWhinney (Ed.), *Mechanisms of language acquisition* (p. 65-87). Hillsdale, NJ: Lawrence Erlbaum Associates.

Gómez, R. L. (2002). Variability and detection of invariant structure. *Psychological Science*, 13, 431-436.

Monaghan, P., Chater, N., & Christiansen, M. H. (2005). The differential role of phonological and distributional cues in grammatical categorisation. *Cognition*, 96, 143-182.

PRESENTATION 2:

Learning syntactic categories (Gender classes): A language learning study with 7-year-olds

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Artificial language experiments have explored the learning of gender-like noun categories; however, these have generally used adult participants. We explore whether 7-year-olds can acquire gender classes via distributional learning using input from a real language (Italian). Monolingual English speaking children heard singular and plural definite NPs of four types:

masculine-singular: il noun[masculine] +o e.g. (il borso)
 masculine-plural: i noun[masculine] +i (i borsi)
 feminine-singular: la noun[feminine] +a (la ballena)
 feminine-plural: le noun[feminine] +e (le ballene)

(All nouns inanimate; no semantic cues to gender).

Children received input over 5 sessions via a game (hear noun-phrase, identify correct picture), with additional tests in session 5. Two (between-subject) conditions manipulated type-frequency: high-type-frequency (8m/8f nouns), low-type-frequency (4m/4f; total exposure matched). We predicted greater generalization under high-type frequency.

Children showed strong and relatively automatized item-level learning: accuracy was high (86%) in the final training session, and a speeded comprehension test indicated usage of gender marking on the determiners to predict the upcoming noun. Gen-

eralization was tested using novel nouns in 2AFC and production tests. Results were mixed: In the 2AFC task children were unable to distinguish novel items with valid determiner-vowel combinations from invalid counterparts (la letto, il letta, i letto, il letti), suggesting they had not extracted determiner-vowel "frames". However, there was some tentative evidence of generalization in the production test where children were asked to extend newly taught words from the singular to the plural (or vice versa). Although most children were not able to change the number of the noun, those who could were likely to produce determiners and suffixes correctly marked for gender. Finally, there was no benefit of high-type-frequency. Instead, there was evidence for a benefit of low-type-frequency, seen particularly in the learning of number markings, suggesting that higher input variability may actually hinder generalization in the early stages of learning.

PRESENTATION 3:

Types and tokens: The role of Complementary Learning Systems in learning new morphology

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We examined the role of memory consolidation processes in learning and generalization of a new morphological system. These processes have been shown to facilitate new word learning in children and in adults (Axelsson et al., 2016). The Complementary Learning Systems (CLS) are thought to underpin them: new memories are initially more strongly supported by the hippocampal system, and then gradually integrated into the neocortex for long-term storage (Davis & Gaskell, 2009; McClelland et al., 1995). Crucially, the encoding schemes used by the two systems support different aspects of new memories: the highly overlapping distributed scheme used by the neocortical system provides stronger support for systematic aspects of new mappings, whereas the hippocampal sparse encoding supports more idiosyncratic forms. The more hippocampal-dependent idiosyncratic forms are subject to stronger memory consolidation effects.

We examined the role of the two memory systems in morphological learning using an artificial language modeled on the English past tense. The majority of forms in the language conformed to a 'regular' (systematic) pattern (high type frequency), and a minority were 'irregulars'. As in natural languages, the irregular items were highly frequent (high token frequency). We were particularly interested in the generalization performance, and how it may change

over time. If the learning of the new morphological system is supported by the CLS, regularizations may be more dominant initially, but the strengthening of the idiosyncratic irregular forms with memory consolidation would lead to an increase of irregularizations over time.

Adult participants were trained on the new language and tested either immediately after learning, or after a 12-hour delay including wake or sleep, or after a 24-hour delay. We provide evidence for the role of memory consolidation in learning new morphology: regularizations dominated generalization performance in immediate tests, with irregularizations increasing over time to become dominant after a 24-hour delay.

References

Axelsson, E. L., Williams, S. E., & Horst, J. S. (2016): The effect of sleep on children's word retention and generalization. *Frontiers in Psychology*, 7, 1-9.

Davis, M. H., & Gaskell, M. G. (2009): A complementary systems account of word learning: Neural and behavioural evidence. *Philosophical Transactions of the Royal Society B*, 364, 3773-3800.

McClelland, J. L., McNaughton, B.L., & O'Reilly, R.C. (1995): Why there are complementary learning systems in the hippocampus and neocortex: Insights from the successes and failures of connectionist models of learning and memory. *Psychological Review*, 102, 419-457.

PRESENTATION 4:

Complexity in language intervention: Training with atypical lexical items promotes generalization to new verbs

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Kiran (2007) demonstrated that when adults with anomia were trained on naming items with atypical category exemplars (e.g., ostrich, penguin), they showed greater generalization than adults with anomia trained with typical exemplars (e.g., robin). Li & Shirai (2001) similarly argue that typical children recognize a morpheme's unique meaning when the tense information in the morpheme and the aspectual information typically associated with a lexical verb are in conflict. We draw on Li & Shirai's work on tense and aspect to extend Kiran's hypothesis to morphology learning. Specifically, we taught children past tense -ed, using a randomized controlled trial to test whether selecting prototypical past tense exemplars (e.g., closed, tripped) or atypical past tense exemplars (e.g., hummed,

bounced) for training led to greater generalization. Intervention used drill and focused stimulation, with verbs selected for treatment based on whether they were prototypical or atypical exemplars of the past tense, as determined by previously published rankings that included verb frequency and telicity as factors. Fifteen children with SLI, who could produce word final -t/-d and exhibited past tense production deficits, were randomly assigned to begin intervention with atypical (N=6) or prototypical (N=9) targets. Changes in accuracy were measured using structured probes. The atypical group made greater gains in accuracy for both trained (Atypical - M = .42; SD = .16; Typical - M = .21, SD = .22, p = .057) and untrained verbs (Atypical - M = .34; SD = .12; Typical - M = .13, SD = .14, p = .008) as compared to the prototypical group. Groups did not differ in pretest values or in the number of verbs learned. The current results support a view that morpheme learning is similar to word learning. Attention to meaning, specifically to evidence that the morpheme contributes a unique meaning and is separable from the verb, may promote greater generalization.

References

Kiran, S. (2007). Complexity in the treatment of naming deficits. *American Journal of Speech Language Pathology*, 16(1), 18-29.

Li, P., & Shirai, Y. (2001). *The Acquisition of Lexical and Grammatical Aspect*. Berlin: Mouton De Gruyter.

SYMPOSIUM

Expressive Language in Dual Language Learners

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DISCUSSANT: Elizabeth Peña, University of Texas at Austin, U.S.A., lizp@mail.utexas.edu

Research in adults establishes the existence of a dynamic interaction between languages in bilinguals. However, as adults, bilinguals have reached native proficiency in at least one language. As such, extant research in adults tells us little about the young bilingual during which language interaction and acquisition occur *simultaneously*. The goal of the present symposium is to examine the influence of language interaction on expressive language in young bilinguals.

The first paper explores changes in code-switching during spontaneous language production at 31 and 39 months of age in French-English and Spanish-English bilinguals and their parents. Findings indicate differences in code-switching across languages, but only within children. Further, children's code-switching patterns were not explained by parental code-switching, but by sociocultural factors (e.g., language exposure and majority/minority status).

The second paper examines the *mechanism* that gives rise to children's code-switching. That is, do children's code-switches indicate a lack of word knowledge in the target language, or smaller vocabularies within and across languages? Results suggest that although language proficiency is negatively correlated with code-switching within a language, this relation is not significant when controlling for relative language exposure.

The third paper investigates the influence of cognate status and word frequency on expressive vocabulary growth in bilinguals at age 5 and 10. Results indicate that the acquisition of cognate and non-cognate words demonstrate different development patterns in each language, whereas the proportion of cognate and non-cognate words known in *both* languages remained stable over time.

These studies point to an interaction between languages modulated by sociocultural factors (e.g., language exposure, majority/minority status, and word frequency) as well as acquired word knowledge across languages (e.g., language proficiency and cognate status). The symposium will end with a discussion of these three papers and how they extend our current understanding of lexical acquisition in early bilingual language development.

PRESENTATION 1:

Code-Switching in Young Bilingual Toddlers and Their Parents

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Bilinguals often mix languages within an utterance while speaking, known as *code-switching* (CS) (Goodz, 1989). Most extant research has been performed in adults (e.g., Yim & Bialystok, 2012). However, there is a dearth of research examining CS in children. This study aims to investigate CS in early toddlerhood across two bilingual groups in the US and Canada.

Children were tested at 31 (mean age = 31;1) and 39 months (mean age = 37;13). Participants were exposed to French and English (N=51) or Spanish and English (N=36). At both testing occasions, two language samples (one for each language) were collected measuring CS.

An ANOVA examined CS in the Spanish-English and French-English bilingual groups, respectively, with CS as the dependent variable and age (31 or 39 months) and language (English/Spanish or French/English) as the independent variables. Results showed a significant effect of language ($F(1,103)=34.11, p<.001$; $F(1, 177)=22.91, p<.001$), indicating a tendency for children to code-switch *least* in English across groups.

We next examined whether parental CS showed a similar pattern to children. Again, an ANOVA with CS as the dependent variable and age and language as independent variables revealed no significant effect of age and language within the Spanish-English and French-English parental groups. Thus, there were no changes in parental CS across languages

over time. Further, parental CS was not correlated to children's CS suggesting that the observed changes in children's CS were not simply due to similar changes in parents.

Together these results indicate that CS patterns change across development and are modulated by sociocultural factors such that English words appeared more frequently within French and Spanish utterances in children reared in Canada and the US. Further, these findings appear robust as they are replicated in two separate bilingual groups.

References

Goodz, N. S. (1989). Parental language mixing in bilingual families. *Infant Mental Health Journal*, 10, 25-44.

Yim, O., & Bialystok, E. (2012). Degree of conversational code-switching enhances verbal task switching in Cantonese-English bilinguals. *Bilingualism: Language and Cognition*, 15, 873-883.

PRESENTATION 2:

Code-Switching and Proficiency in Spanish-English Bilingual Children

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In the United States, there has been a rapid increase in the proportion of children who are exposed to a second language (US Census Bureau, 2011). Of interest is the effect of an English majority language environment on early bilingualism. There is conflicting extant research on the relation between code-switching (CS; alternating between two languages) and vocabulary size in bilingual children (e.g., Byers-Heinlein, 2012; Place & Hoff, 2011). This paper seeks to clarify these findings using a direct measure of spontaneous CS to examine relations with language exposure and vocabulary size.

Participants were Spanish-English bilingual children in a longitudinal study at 31 ($N=33$) and 39 ($N=21$) months of age. Language exposure was assessed using the LEAT (DeAnda et al., 2016). At 31 months expressive vocabulary was assessed on the MCDI (Fenson et al., 1993), and its Spanish equivalent, the IDHC (Jackson-Maldonado et al., 2003). At 39 months, CS and vocabulary diversity were obtained from a parent-child free-play language sample. Exposure was significantly related to CS for both English ($r(32)=-.51$, $p<.01$ at 31 months; $r(20)=-.62$,

$p<.01$ at 39 months) and Spanish ($r(33)=-.44$, $p=.01$ at 31 months; $r(20)=-.51$, $p=.02$ at 39 months). At 31 months, CS in Spanish was negatively correlated with Spanish, but not English, vocabulary ($r(32)=-.39$, $p=.02$, $r(33)=-.32$, $p=.07$, respectively). However, CS was not correlated with vocabulary when controlling for exposure. In contrast, at 39 months CS was not significantly related to vocabulary diversity for either language (all $ps>.80$). The pattern of results was similar to findings at 31 months when vocabulary was assessed with the PPVT (Dunn & Dunn, 1997), and its Spanish equivalent, the TVIP (Dunn, Padillo, Lugo, & Dunn, 1986). These findings address previous inconsistency in the literature by focusing on the potential moderating influence of language exposure.

References

Byers-Heinlein, K. (2013). Parental language mixing: Its measurement and the relation of mixed input to young bilingual children's vocabulary size. *Bilingualism: Language and Cognition*, 16(01), 32-48.

DeAnda, S., Hendrickson, K., Zesiger, P., & Poulin-Dubois, D. (2017) Lexical access in the second year: A study of monolingual and bilingual vocabulary development. *Bilingualism: Language and Cognition*, 1-14.

Dunn, L. M., & Dunn, L. M. (1997). PPVT-III: Peabody picture vocabulary test. Circle Pines, MN: American Guidance Service.

Dunn, L., Padilla, E., Lugo, D., & Dunn, L. (1986). Test de Vocabulario en Imagenes Peabody-Adaptación Hispanoamericana [Peabody Picture Vocabulary Test-Latin American adaptation]. Circle Pines, MN: American Guidance Service.

Fenson, L., Dale, P. S., Reznick, J. S., Thal, D., Bates, E., Hartung, J., ... & Reilly, J. S. (1993). Guide and Technical Manual for the MacArthur Communicative Development Inventories (San Diego, CA: Singular).

Jackson-Maldonado, D., Thal, D., Marchman, V., Newton, T., Fenson, L., & Conboy, B. (2003). Communicative Development Inventory: User's guide and technical manual. Baltimore, MD: Brookes.

Place, S., & Hoff, E. (2011). Properties of dual language exposure that influence 2 year olds' bilingual proficiency. *Child development*, 82(6), 1834-1849.

US Census Bureau (2011). Language use in the United States: 2011 American Community Service Reports. Retrieved from <https://www.census.gov/prod/2013pubs/acs-22.pdf>.

PRESENTATION 3:**Identifying the impact of word characteristics on L1/L2 vocabulary acquisition**

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Bilingual children, by definition, have exposure to two languages and as such add words in each of those languages. Because their exposure to each language is distributed, they add words in each language that are associated with the context (e.g., home or school) in which they hear those words. Specifically, they add words unique to each language (singletons) and words common to both languages (translation equivalents). The nature of this acquisition in bilinguals over time, however, is unclear. Factors that influence which words children add to their lexicon include the frequency of the word in the target language, the child's prior knowledge of the word, and the cognate status of the word. This study aims to elucidate such patterns by identifying word characteristics that influence L1/L2 acquisition over time. 231 children between the ages of 5 and 10 were tested on the same set of items from the English and Bilingual versions of the EO-WPVT. Children completed testing in both of their languages at four time points within 10-12 month intervals. We conducted item-level analyses of responses to using generalized linear mixed models. The goal of these analyses was to investigate how L1 and L2 acquisition varied according to word characteristics (cognates/non-cognates, high/low frequency, home/school concepts). Preliminary analyses indicate that the acquisition of cognate and non-cognate singleton and translation equivalents show differential patterns over time. Cognate and non-cognate words known only in Spanish decrease over time; while those known only in English steadily increased. The proportion of cognate and non-cognate words known in both languages were maintained across time points, providing partial support for the frequency-lag hypothesis. In this seminar, we will discuss these results as well as the influence of frequency and known words on later acquisition.

DAY
5

FRIDAY, 21ST

11:00-13:00, ROOM D101

SYMPOSIUM

SES differences in early linguistic experiences and outcomes

CONVENER: Florencia Alam, National Council of Scientific and Technical Research, Argentina, florenciaalam@gmail.com

Current theories of early language acquisition hold that language development results from the interplay between children's cognitive biases and strategies, and the linguistic experiences available to the young child. Work on the mechanisms involved in early language acquisition relies crucially on careful documentation of the extent of variation in the quantity and quality of linguistic input available to individual children from different socio-economic backgrounds, and their effects on the children's own language development. In this symposium we will present studies on SES differences in early linguistic experiences of Spanish- and English-speaking children from four countries. All the studies consider longitudinal variations and relate linguistic input to children's language development. The first speaker analyses whether exposure to adult speech mediates relations between SES and language outcomes in a Mexican population. The second documents SES differences in input in a very diverse Argentinean sample and considers their impact on vocabulary comprehension assessed with a touch-screen test, specially designed to prevent cultural bias affecting the children's performance. The third presents a study in Great Britain where parents from low and high SES were encouraged to produce contingent talk. Effects of the intervention were obvious short-term, whereas in the long term language production was better predicted by a combination of baseline infant communicative ability, baseline parental speech and socio-economic status. The fourth speaker describes an intervention in the US targeting parental gestures, and measuring potential effects on both parent and child's gestures in the home. Together, these studies provide a comprehensive insight of language acquisition in socio-economically diverse samples, and on which aspects of early experiences may have a lasting impact on the child. We also expect this symposium to stimulate novel ideas for interventions that improve children's language development trajectories.

PRESENTATION 1:

Early language experience mediates SES-differences in language-processing skill and vocabulary in Spanish-learning children

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Many studies with English-speaking families have shown that children from lower socioeconomic status (SES) backgrounds have slower rates of vocabulary growth than their more advantaged peers (Hart & Risley, 1995). The quantity and quality of parental language input has been shown to be a key factor mediating the relation between SES and vocabulary (Hoff, 2003; Rowe & Goldin-Meadow, 2009). Moreover, recent studies suggest that language experience is also related to the development of early language-processing skills that facilitate vocabulary growth. The present study extends these findings to Spanish-learning infants, and asks whether exposure to adult speech also mediates relations between SES and language outcomes in this population.

Monolingual Spanish-speaking infants (n=68) from Mexican or Mexican-American families varying in SES were tested in a looking-while-listening task at 18 and 24 months. Productive vocabulary was assessed with the MacArthur-Bates CDI. Whole-day recordings of children's language environments were recorded using the LENATM system; the number of adult words per hour, as estimated by LENA, served as our measure of adult speech.

Analyses revealed four main findings: (1) Children's vocabulary and speed of spoken word recognition were significantly associated with SES; (2) The amount of speech children heard in a typical day also varied by SES; (3) Children who heard more speech at 18 months had higher vocabularies and were faster in spoken word recognition at 18 and 24 months; (4) Finally, links between SES and children's language outcomes were partially mediated by the amount of adult speech to which children were exposed in a typical day.

These results show that SES-differences in language development that have been observed in English-learning children are also present among Spanish-speaking children, and that differences in both language-processing skills and vocabulary are partially explained by infants' exposure to speech from adult caregivers.

References

Hart, B. M., & Risley, T. R. (1995). *Meaningful Differences in the Everyday Experience of Young American Children*. Baltimore, MD: Brookes Publishing Co.

Hoff, E. (2003). The specificity of environmental influence: Socioeconomic status affects early vocabulary development via maternal speech. *Child Development*, 74(5), 1368–1378.

Rowe, M. L., & Goldin-Meadow, S. (2009). Differences in early gesture explain SES disparities in child vocabulary size at school entry. *Science*, 323, 951–953.

PRESENTATION 2:

SES variations in language input and comprehension outcomes among Argentine toddlers

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Previous research documents profound differences in both input and outcome as a function of familial socio-economic status (SES; e.g., Huttenlocher et al., 2002). Most have studied relatively educated and rich populations, e.g. incomplete high school versus college graduates in the US. Current results regarding these educational ranges for Spanish learners suggest weaker relationships between SES and language acquisition (De Anda et al., 2015). Are effects of SES similar in other cultures and other educational ranges?

We are carrying out a longitudinal project with 63 toddlers (mean age at the start: 14 months), 36 from middle SES (mean length of parents' education: 20 years) and 27 from low SES (mean length of parents' education: 9 years). We recorded their early linguistic experiences repeatedly; 2 hours from an initial audio-recording gathered from 10 children in each SES group have been fully transcribed. Additionally,

vocabulary comprehension was assessed about 15 months after the start of the study, with a touch-screen test built such that all stimuli had similar token frequency in middle and low SES households in Argentina, in order to prevent cultural bias affecting the children's performance.

Group comparisons suggest that low-SES children hear significantly lower numbers of tokens, less lexically diverse speech addressed in shorter utterances than mid-SES children; however, they overhear more speech, such that overall quantities are not significantly different. Moreover vocabulary comprehension scores are lower for low-SES than mid-SES children. Ongoing analyses assess potential links between some aspects of the input and children's comprehension performance.

Overall, it appears that SES differences in language input and outcome reported in previous studies are also evident in the present, widely diverse sample. Future work using meta-analytic methods may be able to assess whether SES differences are stable in size across cultures and educational ranges.

References

Deanda, S., Arias-Trejo, N., Poulin-Dubois, D., Zesiger, P., & Friend, M. (2016). Minimal second language exposure, SES, and early word comprehension: New evidence from a direct assessment. *Bilingualism: Language and Cognition*, 19(01), 162–180.

Huttenlocher J., Vasilyeva M., Cymerman E., Levine S. (2002) Language input and child syntax. *Cognitive Psychology*, 45, 337–374

PRESENTATION 3:

The social gradient in early language development: An RCT to test the role of parent contingent talk

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Early language skills are critical for later academic success. A social gradient in these skills emerges in early childhood and is thought to be in part due to differences in parent contingent talk (how often parents talk about what is in the focus of their infants' attention). In a randomised controlled trial with high and low SES families, 138 11-month-olds and

their caregivers were randomly allocated to either a contingent talk intervention or a dental health control. Families in the language intervention watched a video about contingent talk and were asked to practice it for 15 minutes a day for a month. Parent communication was assessed at baseline and after one month. Infant communication was assessed at baseline, 12, 15, 18 and 24 months. At baseline, social gradients were observed in 11-month-old vocalisations and in parent contingent talk. At post-test, parents in the intervention group engaged in significantly more contingent talk. Low SES parents in the intervention condition also reported that their children produced significantly more words at 15 and 18 months. Naturalistic transcriptions of infant word production revealed parent reports of expressive vocabulary were reliable. Effects of the intervention did not persist at 24 months. Instead language measures at this age were best predicted by a combination of baseline infant communicative ability, baseline parental speech and socio-economic status. We conclude that it is possible to increase contingent talk in low SES families and thereby promote vocabulary growth. However, the effects of low-intensity intervention are not long lasting meaning follow-up interventions would be necessary to yield benefits lasting to school entry.

PRESENTATION 4:

A parent-gesture intervention to reduce early SES gaps in child vocabulary

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Research on the “word gap” highlights average SES-related differences in parent talk that result in persistent SES gaps in children’s early vocabulary development (Hart & Risley, 1995); gaps that have consequences for literacy development and school success (Durham et al., 2007). A growing body of work is uncovering the specific features of caregiver input that contribute most to children’s language skills at different stages of early development (e.g., Hirsh-Pasek et al., 2015). Building off of work in this area showing that SES differences are apparent in children’s gesture use at 14-months and are potentially due to differences in parents’ gesture use, we present results of a pilot intervention targeted at increasing parents’ pointing in order to potentially increase children’s pointing and early vocabulary growth.

Fifty parent-child dyads are visited five times in their homes between child ages 10-18 months. At the first visit, after collecting baseline data, half of the families were randomly assigned to receive the gesture training, *Pointing to Success*, which consisted of watching an animated video tutorial on the importance of pointing and discussing with the home visitor. Parents were then encouraged to point with their children during 15-minute daily play sessions. At each visit, parents filled out the M-CDI, and parent-child dyads were videotaped playing with age-appropriate toys for 15-minutes. Videotapes are transcribed and coded for parent and child gesture and speech.

Preliminary results ($n=26$) reveal that the intervention resulted in a marginally significant increase in parent and child gesture use from the baseline to second visit. Ongoing analyses will continue to examine these effects with the full sample and will investigate effects on children’s vocabulary growth. As SES differences in child gesture have cascading consequences for later development, intervening early around specific features of input may prove a promising strategy in reducing the word gap.

References

- Durham, R.E., Farkas, G., Hammer, C.S., Tomblin, J.B. and Catts, H.W. (2007) Kindergarten Oral Language Skill: A Key Variable in the Intergenerational Transmission of Socioeconomic Status. *Research in Social Stratification and Mobility* 25(4): 294–305.
- Hart, B., & Risley, T. R. (1995). Meaningful differences in the everyday experience of young American children. Paul H Brookes Publishing.
- Hirsh-Pasek, K., Adamson, L. B., Bakeman, R., Owen, M. T., Golinkoff, R. M., Pace, A., ... & Suma, K. (2015). The contribution of early communication quality to low-income children’s language success. *Psychological Science*, 0956797615581493.

DAY
5

FRIDAY, 21ST

14:00-16:00, GRAND AMPHI

SYMPOSIUM

Common ground in communication: Integrating evolutionary, developmental and clinical perspectives

CONVENER: Manuel Bohn, Max Planck Institute for Evolutionary Anthropology, Germany, manuel_bohn@eva.mpg.de

DISCUSSANT: Eve Clark, Stanford University, U.S.A, eclark@stanford.edu/

PRESENTATION 1:

Common ground in non-linguistic communication: Evidence from twelve-month-old infants and great apes

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Communication about absent and displaced entities is a fundamental property of human language. The use of conventional symbolic systems allows humans to extend their communicative interactions beyond the here and now. However, given enough common ground with an interlocutor, reference to absent entities is also possible using non-conventional means such as a pointing gesture (Liszkowski et al., 2009; Lyn et al., 2013, Tomasello, 2008). For example, across a noisy room a guest might ask the waiter for another drink by pointing to his empty glass. In a series of studies we explored the developmental and evolutionary origins of this ability. Specifically, we asked whether twelve-month-old infants and great apes would adjust their communication about absent entities to previous interactions (common ground) with their interlocutor

In our study, participants could request objects (food or toys) from two different locations. One location contained highly desirable items and the other contained less desirable items. During a warm-

up phase, participants requested visible objects from one experimenter. As soon as one location was depleted, the experimenter left the room and we manipulated who would return to the scene. If the same experimenter returned to the room, it was common ground that the empty location previously contained highly desirable objects. In this situation, participants could use the empty location to request more objects. If a different experimenter returned to the room, there was no common ground between the communicative partners and participants should choose the less desirable option instead. We measured how often participants would point to the empty location in the different conditions.

Our results show that infants and apes adjust their pointing to previous interactions with their communicative partner. We will relate these results to the discussion around the phylo- and ontogenetic origins of the ability to use common ground in communication.

References

Liszkowski, U., Schäfer, M., Carpenter, M., & Tomasello, M. (2009). Prelinguistic infants, but not chimpanzees, communicate about absent entities. *Psychological Science*, 20(5), 654-660.

Lyn, H., Russell, J. L., Leavens, D. A., Bard, K. A., Boysen, S. T., Schaeffer, J. A., & Hopkins, W. D. (2014). Apes communicate about absent and displaced objects: Methodology matters. *Animal Cognition*, 17(1), 85-94.

Tomasello, M. (2008). *Origins of human communication*. Cambridge, MA: MIT Press.

PRESENTATION 2:

Three- and four-year-olds rapidly integrate a communicative partner's perspective

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Spoken communication often requires listeners to rapidly integrate both linguistic and non-linguistic information to interpret the intended meaning of a message and produce an expedient social response. During the preschool years, children undergo significant improvements in their ability to track the visual perspective of their speaker in order to constrain their interpretation of spoken utterances. How the timing and accuracy of this process changes with age remains unclear. To address this

issue, we examined the efficiency of communicative perspective-taking in two different age groups: 3-year-olds ($n = 20$, $Mage = 3.27$), and 4-year-olds ($n = 24$, $Mage = 4.19$). We measured children's eye gaze as they interpreted spoken instructions (e.g., "Look at the duck. Point to the duck") to identify objects on a display. The speaker's visual access to display items was manipulated across trials such that a competing referent (e.g., a non-target duck) was either mutually visible to both the child and the speaker (i.e., Common Ground condition) or exclusively visible to the child (i.e., Privileged Ground condition). Across both age groups, children were more likely to fixate on the target referent in the Privileged Ground condition ($M = .29$) than in the Common Ground condition ($M = .13$), $t(43) = 2.34$, $p = .02$. On Privileged Ground trials, children in both age groups also began to fixate on the target above chance while the first critical noun was still unfolding, suggesting early integration of perspective information. However, when explicit pointing responses were assessed, 3-year-olds did not select target items above chance, indicating that they were not sensitive to their speaker's perspective. Together these findings demonstrate that 3- and 4-year-olds do not differ in the efficiency with which they can integrate a communicative partner's perspective, but do differ in their abilities to translate implicit sensitivity into an explicit interpretation.

PRESENTATION 3:

Children use personal and cultural common ground in their reasoning with peers

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Justifying a proposal is a complex linguistic skill, which requires children to adapt the informativeness of their justifications according to the common ground they share with their interlocutor.

Previous studies have shown that children use personal and cultural common ground for their understanding of communicative acts. (e.g., Moll, Richter, Carpenter, & Tomasello, 2008; Liebal, Carpenter, & Tomasello, 2013). We investigated whether preschoolers also use common ground for their language production, namely to adapt the informativeness of their justifications when reaching a joint decision with a peer.

In study 1, we introduced pairs of 3- and 5-year-olds ($N=146$) to a novel animal with special features (e.g. it eats stones). We taught the children about the animal

either together (common ground condition) or separately (two experts condition) or only one child was taught about the animal (one expert condition). Later, the children collaboratively choose items that the animal would need in a zoo cage.

Children of both age groups used informative justifications mentioning the animal's characteristics significantly more often in the two conditions without personal common ground than in the common ground condition.

In study 2, pairs of 3- and 5-year-olds ($N=148$) were asked to jointly punish one of two characters, each of them introduced to one of the children. One child heard about a character violating either a moral norm (moral condition) or a context-specific rule (social rules condition), while the other child learned about a neutral character.

Children of both age groups produced more informative justifications, mentioning the violated rule in the social rules condition than in the moral condition. Here they relied on factual statements (e.g. "She stole."), inferring moral common ground even without an explicit joint teaching experience.

We show that already 3-year-olds rely on personal and cultural common ground when forming justifications in their peer discussions.

References

Liebal, K., Carpenter, M., & Tomasello, M. (2013). Young children's understanding of cultural common ground. *British Journal of Developmental Psychology*, 31(1), 88-96.

Moll, H., Richter, N., Carpenter, M., & Tomasello, M. (2008). Fourteen-Month-Olds Know What "We" Have Shared in a Special Way. *Infancy*, 13(1), 90-101.

PRESENTATION 4:

Social versus visual perspective-taking and the interpretation of linguistic reference by children with ASD

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Individuals with Autism Spectrum Disorder (ASD) frequently fail to interpret the communicative intent of a speaker's utterance during conversation, apparently because they have difficulty determining the crucial aspects of common ground, which they

share with the speaker. Only two studies (both with adults with ASD) have previously investigated this experimentally (Begeer et al., 2010; Sanstieban et al., 2015). Both manipulated level one visual common ground (i.e. whether the speaker can see a particular object). Both found that the participants with ASD were unimpaired relative to typical controls. However, visual perspective-taking may not align in development with social perspective-taking; that is, understanding the interlocutor-specific experiences which one has shared with the conversation partner (e.g. Moll & Kadipasaoglu, 2013). We compared eight- to eleven-year-olds with ASD who were matched on non-verbal IQ (WASI matrix reasoning) and structural language (CELF-P 'Following directions') with typically-developing eight- to eleven-year-olds. We tested the interpretation of linguistic reference (e.g. 'that ball') in contexts which would be ambiguous if the child did not utilize perspective-taking (i.e. where the child can see two balls). Both groups found target-like interpretation of linguistic reference more difficult in the social perspective taking condition than in the level one visual perspective-taking condition. We discuss the relative subtlety of social common ground, particularly in relation to setting up expectations that a speaker will refer to a 'given' versus 'new' object.

References

Begeer, S., Malle, B., Nieuwland, M. & Keysar, B. (2010). Using Theory of Mind to represent and take part in social interactions: Comparing individuals with high-functioning autism and typically developing controls. *European Journal of Developmental Psychology*, 7(1), 104–122.

Moll, H. & Kadipasaoglu, D. (2013). The primacy of social over visual perspective-taking. *Frontiers in Human Neuroscience*, 7, article 558.

Santiesteban, I., Shah, P., White, S., Bird, G. & Heyes, C. M. (2015). Mentalizing or submentalizing in a communication task? Evidence from autism and a camera control. *Psychonomic Bulletin & Review*. 2(3), 844-849.



DAY
5

FRIDAY, 21ST

14:00-16:00,

AMPHI LUCIE AUBRAC

SYMPOSIUM

Improving vocabulary and word learning for adolescents with language difficulties in schools: exploring content, process and service provision.

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DISCUSSANT: David Messer, School of Health Sciences, City, University of London and Open University, U.K., david.messer@open.ac.uk

There is strong evidence for the pervasiveness of early language difficulties (LD), and its long term impact on academic performance, employment, socialisation and wellbeing. These difficulties persist over time, and increase with age and with the increasing demands of adolescence and adulthood (Johnson et al., 2010). Adolescents and young adults with LD are a significantly under-researched and under-served client population (Larson & McKinley, 1993).

Vocabulary and independent word learning are essential skills for literacy and academic achievement (Feinstein & Duckworth, 2006.), and vocabulary deficits are evident in people with LD. Despite this, little direct work in the classroom focuses on teaching new vocabulary.

The symposium addresses this gap in the literature by focusing on enhancing vocabulary and word learning in adolescents with LD in the UK, Ireland and USA. The symposium aims to 1) investigate the content, type and agent of vocabulary training for adolescents in secondary school; and 2) explore the effectiveness of a range of vocabulary interventions across different models of service provision.

The first paper addresses the links between vocabulary and literacy and explores the selection of appropriate words and figurative expressions, found in secondary school texts, for intervention. The second paper reports on an intervention study exploring the effectiveness of a structured vocabu-

lary intervention delivered by teaching assistants to groups of adolescents with LD. Presentation 3:

employs a whole-class structured vocabulary intervention to adolescents with varying levels of LD from areas of social disadvantage, delivered by teachers. Finally, paper 4 reports on a study investigating the effectiveness of embedding phonological and semantic activities in Science classes, delivered by teachers.

The discussant will draw together common themes across the Presentations, comment about methodology and look to future directions of this important topic of research.

References

Johnson, C.J., Beitchman, J.H. and Brownlie, E.B. (2010). Twenty-Year Follow-Up of Children With and Without Speech-Language Impairments: Family, Educational, Occupational, and Quality of Life Outcomes. *American Journal of Speech Language Pathology*, 19: 51 - 65.

Larson, V. L., & McKinley, N. L. (1993). An introduction. *Language, Speech, and Hearing Services in Schools*, 24, 19-20.

Feinstein, L. & Duckworth, K. (2006). Development in the early years: Its importance for school performance and adult outcomes (No. 20). London: Centre for Research on the Wider Benefits of Learning.

PRESENTATION 1:

Building a Literate Lexicon in Adolescents: Selecting Words for Language Intervention

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Research Questions : Adolescents in middle school (ages 11-14 years old) are expected to acquire knowledge of advanced material in subject areas such as science, mathematics, and literature. To acquire this knowledge, students must comprehend complex spoken and written language. For many students, especially those with language impairments, this is a challenging task, in part because it requires an understanding of sophisticated words and expressions. These include, for example, a variety of derived nouns (precipitation), derived adjectives (exponential), and figurative expressions (Underground Railroad). In this study, we examined middle school reading materials and asked the following questions:

1. How common are these types of words and expressions across the subject areas?
2. Are certain types of lexical items more common than others in different subject areas?

Methods

A corpus analysis was performed on reading materials used in middle school classrooms, focusing on the literate lexicon. Specifically, we examined the presence of derived nouns, derived adjectives, and figurative expressions in passages drawn from books used to teach science, mathematics, and literature to adolescents. Three different books were selected for each subject area, examining a random selection of passages, each of which contained at least 150 words.

Results

Across the three subject areas, all three types of literate words and expressions frequently occurred. However, figurative expressions (especially metaphors) occurred more often in literature books, whereas derived adjectives and derived nouns occurred more often in science and mathematics books.

Conclusions

The study has implications for language intervention with adolescents. To ensure classroom relevance, derived words can be selected from science and mathematics books, figurative expressions can be selected from literature books, and students can be taught to use the strategies of morphological analysis and contextual abstraction to learn the meanings of these lexical items.

References

- Ravid, D. (2006). Semantic development in textual contexts during the school years: Noun scale analyses. *Journal of Child Language*, 33(4), 791-821.
- Snow, C. E. (2010). Academic language and the challenge of reading for learning about science. *Science*, 328, 450-452.

PRESENTATION 2:

Enhancing vocabulary and independent word learning skills in adolescents with language disorder.

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Background

Longitudinal research reflects the persistent nature of language disorder (LD) and its wider long term impact on educational, emotional and psychosocial functioning into adolescence and adulthood (Johnson et al., 2010). Many children with LD have limited vocabulary, and the increasing complexity and abstractness of language in secondary school provides further challenges. Thus, it is important to identify evidence-based language interventions that can be delivered in schools to enhance language and communication.

Aim

This research investigates the effectiveness of a vocabulary intervention programme, delivered by teaching assistants, in improving vocabulary, idioms and independent word learning in secondary school-aged students with LD.

Method

A randomised control design was used. Participants were a group of 358 adolescents (mean age: 12; 1 years) with LD. The students were randomly assigned to one of four conditions 1) a narrative group, 2) a vocabulary group, 3) a combined narrative/vocabulary group and 4) a delayed treatment group.

This talk focuses on the two groups receiving vocabulary intervention, with the other two groups (narrative and delayed) acting as controls. The interventions were delivered by teaching assistants in small groups in school over a 6-week period; 3 times per week, with a total of 18 sessions per group. Twenty-one schools participated across two outer London boroughs. Outcome measures included standardised and non-standardised general language and vocabulary measures.

Results

The vocabulary group made significantly greater progress on an idiom awareness task in comparison to the control group. The combined narrative/vocabulary group showed significant gains, relative to controls, on idiom awareness and on an expressive definitions task. These improvements were not evident on standardised measures of vocabulary or figurative language.

Conclusions

Vocabulary intervention, delivered by teaching assistants in mainstream schools, was effective in enhancing idiom knowledge. Additional gains in expressive vocabulary were observed in the group receiving vocabulary and narrative intervention. Improvements on standardised vocabulary tests and receptive vocabulary were not found.

References

Johnson, C.J., Beitchman, J.H. and Brownlie, E.B. (2010). Twenty-Year Follow-Up of Children With and Without Speech-Language Impairments: Family, Educational, Occupational, and Quality of Life Outcomes. *American Journal of Speech Language Pathology*, 19: 51 - 65.

PRESENTATION 3:

The effectiveness of a vocabulary enrichment programme in improving the vocabulary skills of adolescents attending mainstream secondary school in areas of socio-economic disadvantage

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Research Question

Young people from areas of socioeconomic disadvantage (SED) are more likely to present with vocabulary difficulties (Spencer *et al*, 2012). Studies have shown the effectiveness of vocabulary interventions for children with language impairment but not for adolescents from areas of SED. This research aims to establish the effectiveness of a whole-class intervention delivered by English teachers, in improving adolescent vocabulary in secondary schools in areas of SED.

Method

372 adolescents (aged 11;11-13;11) from 6 secondary schools were assessed pre and post-intervention on measures of receptive and expressive language. Two groups received the intervention in the first school term (twice a week for approximately 12 weeks): one on the East Coast (ECI: N= 169); one on the West Coast (WCI: N=128) and were compared with a West Coast control group (n=75).

Results

At pre-intervention stage, over 50% of all students scored in the vocabulary difficulties range. Relative to controls, the ECI and WCI group showed signif-

icant improvement on raw score measures of expressive language and receptive vocabulary, the WCI group also showed significant improvement on expressive language and receptive vocabulary standard scores.

Conclusions

Results suggest that whole-class teacher directed intervention has the potential to improve vocabulary skills. The difference in outcomes between the groups of treated children may be explained by the fact that the ECI group achieved poorer scores on pre-testing or because the ECI group tended to spend more than the suggested 12 weeks administering the programme.

The whole-class programme is now run annually by 11 Irish schools. Based on teacher feedback, the programme has evolved over time. It currently comprises a core 16-lesson programme with crucial objectives for progression highlighted as well as optional additional activities.

References

Spencer, S., Clegg, J. and Stackhouse, J. (2012) Language and disadvantage: a comparison of the language abilities of adolescents from two different socioeconomic areas. *International Journal of Language and Communication Disorders*, 47(3), 274-284.

PRESENTATION 4:

Whole-class vocabulary intervention for adolescents with language difficulties.

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Background

Five to six percent of children have language difficulties (LD) in the absence of physical, neurological, or sensory impairment, and these difficulties can persist throughout the school years (Law *et al.*, 2000). Many of these children have limited vocabulary, which places them at risk for academic failure (Dockrell *et al.*, 2007). There is evidence for the effectiveness of phonological and semantic vocabulary intervention with the primary school age group (5 - 11 years) (e.g. Motsch & Marks 2015), but less research with the secondary school age group (11 - 16 years).

Individual and targeted models of therapy delivery, necessitating withdrawal of students from class for intervention, can be problematic at secondary school.

Aim

This study therefore aims to investigate the effectiveness of embedding phonological-semantic activities within the mainstream secondary school curriculum, to enhance the vocabulary skills of adolescents with LD, in a universal model of delivery.

Method

Eight-three students with LD aged 11 – 13 years were recruited from eight schools. They were taught science curriculum words by teachers in class, under two conditions: 1) 10 words taught using routine teaching practice; and 2) 10 words taught using whole-class vocabulary intervention techniques including phonological-semantic activities. The phonological-semantic activities involved exploring what a word sounds like and what it means e.g. “evaporation begins with e, has 5 syllables, and means when a liquid turns into gas”. Increase in word knowledge was measured for both of these sets of words, together with a set of 10 words receiving no input.

Results:

Preliminary results indicate that participants’ word knowledge made greater progress following whole-class vocabulary intervention than following routine teaching practice. Positive feedback regarding whole-class vocabulary intervention was received from teachers.

Conclusions

This research highlights effective strategies which can be used by teachers in mainstream secondary school classes to enhance the vocabulary skills of students with LD.

References

- Dockrell, J., Lindsay, G., Palikara, O., & Cullen, M. A. (2007). Raising the achievements of children and young people with specific speech and language difficulties and other special educational needs through school to work and college (RR837). Institute of Education London: Department for Education and Skills
- Law, J., Lindsay, G., Peacey, N., Gascoigne, M., Soloff, N., Radford, J., ... Fitzgerald, L. (2000). Provision for Children with Speech and Language Needs In England and Wales. Research Report 239. London UK: Department for Education and Employment

- Motsch, H.-J., & Marks, D.-K. (2015). Efficacy of the Lexicon Pirate strategy therapy for improving lexical learning in school-age children: A randomized controlled trial. *Child Language Teaching & Therapy*, 31(2), 237–255.

SYMPOSIUM

Early language acquisition: Beyond WEIRD

CONVENER: Scaff, Camila, LSCP, Département d'études cognitives, ENS, EHESS, CNRS, PSL, Paris Diderot, Ecole Doctorale Frontières du Vivant (FdV) – Programme Bettencourt, France, camila.scaff@cri-paris.org

The question of how early linguistic experience shapes early language acquisition has triggered myriads of studies on caregiver speech and children's early comprehension. A stunning majority of this work is based on the Western, Educated, Industrialized, Rich and Democratic (WEIRD; Henrich, Heine, & Norenzayan, 2010) children who are easily studied given the location of most research labs. The developmental conditions that these children experience are far from being representative of the circumstances most humans commonly live in today, as most are not rich and/or living in industrial societies. Those WEIRD conditions are not representative either of the situation that humankind has experienced for most of its biological history, which is probably better represented by current-day hunter-gatherers. Might WEIRD findings on early language acquisition nonetheless generalize to humans in general? It has been historically difficult to answer this question due to the relative inaccessibility of non-WEIRD populations. Fortunately, researchers now benefit from increasingly cheap portable technology, such as recording devices with long-lasting batteries, as well as novel paradigms that are robust to cultural differences in child volubility and which can be adapted for the field. This symposium aims to present an overview of ongoing non-WEIRD research on caregiver speech and children's early comprehension. Our speakers will discuss children's early input and/or outcomes in different populations of interest, including children growing up in pre-industrial societies. Additionally, they will introduce ingenious methodological tools used to describe linguistic experiences and characterize language learning. We hope this symposium will encourage discussion on the generalizability of research findings across (non-)WEIRD populations and serve as a springboard for future investigations.

References

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). Most people are not WEIRD. *Nature*, 466(7302), 29-29.

PRESENTATION 1:

Quantity and composition of child-directed speech among Tsimane forager-horticulturalists of Bolivia

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Quantitative observations suggest that young children in pre-industrial societies receive little directed speech (Yucatec Mayan [1]; Luo [2]), and some have argued that fellow children provide substantial proportions of verbal input (e.g., [2]). We draw from systematic observations among Tsimane forager-horticulturalists in lowland Bolivia to provide a culturally valid reference to infants' input quantity and composition by contrasting their experiences with those of older children.

Household clusters across six Tsimane villages were sampled throughout the year during two- or three-hour time blocks between 7AM and 7PM. Behaviors, including social interactions, of all cluster residents and visitors were recorded every 30 minutes by observers blind to the goals of the present study (N-observations=43,903; N-individuals=952), a method that permits accurate estimation of the frequency of daytime activities and interactions.

We find that Tsimane children aged 0-4 years are spoken to for less than a minute per hour on average, which is two times less than Tsimane aged 4-8 years, and four times less than Tsimane aged 8-17 years. For infants aged 0-3 years, the majority of directed verbal input comes from adults (the mother being the most common single conversational partner). The proportion of one-on-one speech involving mothers decreases markedly after age 3, whereas that involving siblings and other children increases.

Thus, we confirm the expectation that there would be low quantities of directed speech early on, and we can further add that this is maintained throughout early childhood. The lack of change within the first three years of life seems inconsistent with the idea that the onset of production leads to more di-

rected speech. We observe a sizable contribution of adults early on, which was in fact also quantitatively apparent in previous work [1-2], suggesting that the importance of fellow children in promoting verbal acquisition may have been overstated.

References

Shneidman, L. A. (2010). Language input and acquisition in a Mayan village (Unpublished doctoral dissertation). The University of Chicago.

[Harkness, S. (1977). Aspects of social environment and first language acquisition in rural africa. In C. E. Snow & C. A. Ferguson (Eds.), Talking to children.

PRESENTATION 2:

Early language experience and development in a Tzeltal Mayan and PNG village

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What is the nature of the link between early language experience and later language outcomes? Recent work on socioeconomically diverse Western samples convincingly shows that children's linguistic input affects their language learning (e.g., Weisleder & Fernald, 2013). But this perspective is still limited to children growing up in Western families. Outside of the Western world, styles of caregiver-infant interaction vary widely across cultures (Lieven, 1994). And yet, children in all of these places grow up to be competent language users. These facts present us with a theoretically substantial gap which might be summarized as follows: Given children's apparent overall robustness to variation in early language experience, which aspects of their linguistic environment affect language development (and why)?

Data from non-Western, small-scale language communities challenge us to carefully reconsider what "counts" for early language development in bridging this theoretical gap. By studying development in non-Western cultures, we stand to better understand the scope of variation in early language experience, and thereby better identify which aspects of language learning are sensitive to early experience and which are more robust.

To help address this challenge, I collected day-long natural speech recordings and linguistic experimental data from children under age five in two non-Western cultures; one in which caregivers engage children in intensive, face-to-face verbal interaction from infancy (Papua New Guinean: Rossel Island) and one in which early caregivers instead

aim to keep their infants calm and quiet (Tzeltal Mayan: Tenejapa). I aim to track children's early language experience and development over the first few years of life in these two sites with broadly similar lifestyles but radically different styles of caregiver-infant interaction. I will present some initial findings from these data and discuss their relevance for the link between early language experience and communicative development.

References

Weisleder, A., & Fernald, A. (2013). Talking to children matters early language experience strengthens processing and builds vocabulary. *Psychological science*, 24(11), 2143-2152.

Lieven, E. V. (1994). Crosslinguistic and cross-cultural aspects of language addressed to children.

PRESENTATION 3:

Culture and Communication from Infancy through Preschool: A Focus on Ethnically Diverse U.S. Families

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Culture infuses all aspects of language and communication, including the words, phrases, gestures, and body movements that characterize everyday social interactions. Parent-child interactions are a core conduit for children to learn about their worlds and develop skills that are valued in their cultural communities. Language and gestures are primary ways that parents convey culture to children: How parents communicate and what they communicate about provide children with important messages about communicative norms.

Three studies illustrate the "culture of communication", based on video-recorded observations of U.S. mothers and children of African American, Dominican, Mexican, Chinese, and white non-Latino backgrounds (infancy through 1st grade).

Study 1 examined differences among mothers in the pragmatic forms and content of language and gestural communications to 1- and 2-year-olds during play. Latino mothers, particularly recent Mexican immigrants, relied more on gestural communications and regulatory language to elicit infant attention and guide actions ("Look!"; "Sit down") compared to mothers of other ethnicities. Referential language (references to objects and events) was high in native-born mothers.

Study 2 documented ethnic differences in mothers' cultural messages to preschoolers during narratives during booksharing (talk about individual goals, emotions, or appropriate behavior), and showed that preschoolers' independent storytelling mirrored the themes expressed in their mothers' talk.

Study 3 revealed cultural differences in mothers' talk during play with preschoolers with blocks that contained letters, pictures, numbers, and math symbols (+, =). Chinese mothers were highest on math talk; African American mothers highest on literacy talk; and Latino mothers used the blocks to teach labels and colors.

Across the three studies, cultural variations in the forms and functions of language and gestural communications to young children played out in child skills: including vocabulary size, the use of gestures and vocalizations, the themes children expressed in their narratives, and even children's understanding of math concepts.

PRESENTATION 4:

Interaction patterns of Hadza hunter-gatherer infants

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This Presentation is on a research project on communication development of Hadza hunter-gatherer infants in Tanzania. Hunter-gatherer communities are underrepresented in psychological research, but could shed light on conditions that our ancestors might have faced. Hunter-gatherer societies have been characterized as egalitarian and the Hadza are a community with few tools and rituals, even when compared to other hunter-gatherer societies (Marlowe, 2010) making them a particularly interesting case.

Infants were studied using observational methods, focused on their daily experiences and development in different domains, video-recordings and a device specifically designed for this project, the Multimodal Interaction Recorder for Children (MIRC). The MIRC is integrated in a chest strap and records physiological arousal, the distance of major caregivers and family members from the child (who also wear a related device) and the verbal input the infants experience. The MIRC is worn throughout the day and therefore provides a long stream of data that gives insight into the way the child processes input from their environment and which interactional partners elicit arousal.

The current Presentation will focus on the multi-

tude of communicative input that is available to Hadza children. Throughout the day, Hadza men and women spend most their time separately. While babies spend much of their time with their mothers and other women, children form mixed age play groups. The children move freely throughout and in the environment of their camp. They interact with women and men, play inside and outside huts. While adults loosely monitor the play groups and occasionally come and console a crying child, they usually do not intervene. Rather it is the older children's role to help and restrain the younger ones. Data will be presented with whom infants at different ages spend their time and who addresses them verbally or interacts with them non-verbally.

References

Marlowe, F. (2010). The Hadza: hunter-gatherers of Tanzania (Vol. 3). Univ of California Press.

SYMPOSIUM

One size does not fit all: Bilingual development across linguistic domains and socio-cultural contexts

CONVENER: Erika Hoff, Florida Atlantic University, U.S.A., ehoff@fau.edu

The papers in this symposium ask questions about how bilingual development may or may not differ from monolingual development and about how external and internal factors affect bilingual outcomes. The common answer across the four studies reported here is “it depends.”

Whether bilinguals differ from monolinguals depends on the linguistic domain, child age, and child home language environment.

One paper reports findings that simultaneous Spanish-English bilinguals in the U.S. differ from monolinguals in vocabulary and speech sound accuracy at 2 ½ years and catch up in speech sound accuracy, but not in expressive vocabulary, by age 5. The evidence reported in a second paper on immersion students in Canada suggests, however, that if exposure to a new language only begins in school, then it is speech sound accuracy that differs from monolinguals while receptive language skills do not. Whether maternal education predicts mothers’ language use or children’s language growth depends on the sociocultural group, the language in which mothers are educated, and the language in which child growth is measured. The third paper reports findings that among immigrant families in Canada more educated mothers use English less than less educated mothers, while among refugee families, also in Canada, more educated mothers use English more. The fourth paper reports the finding that among immigrant families in the U.S., mothers’ level of education achieved in English predicts their children’s English skill, but not their Spanish skill and mothers’ level of education achieved in Spanish (marginally) predicts their children’s Spanish skill, but not their English.

Together these papers make the argument that bilingual development is not a single phenomenon— the development of speech abilities, vocabu-

lary, and comprehension skills may follow different trajectories. They also make the argument that bilingual development cannot be understood without considering the social contexts in which it occurs. The discussant (Diane Poulin-Dubois, Concordia University) will comment each of these arguments.

PRESENTATION 1:

Bilingual children catch up to monolingual peers in speech abilities at age 5

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Previous research has established it takes bilingual children longer to acquire each of their two languages than it takes for monolingual children to acquire a single language, based on vocabulary development. Studies of bilingual phonology have not focused on the rate of speech development. This study asks whether bilingual preschoolers catch up to monolingual English-speaking peers in expressive vocabulary and speech sound accuracy by age 5 years.

Participants included 47 Spanish-English bilingual children exposed to Spanish and English from birth and a group of 10 age-matched monolingual English-speaking peers at 30 months and 5 years. We measured English expressive vocabulary using the Expressive One-Word Picture Vocabulary Test. We assessed speech sound production accuracy using a 12-item English-word repetition task at 30 months, and the Goldman-Fristoe Test of Articulation – 2 at 5 years. Repeated measures MANOVA compared groups on vocabulary and speech measures at 30 months and 5 years.

Bilingual children had poorer speech skills and smaller English vocabularies than monolinguals at age 30 months ($F(1, 55) = 3064.77, p < .001, F(1, 55) = 504.20, p < .001$). Children in both groups improved in speech and vocabulary skills from 30 months to 5 years (speech $F(1, 55) = 32.40, p < .001$, vocabulary $F(1, 55) = 652.87, p < .001$), but at age 5, groups differed only on speech and not vocabulary ($F(1, 55) = 5.33, p = .02$, and $F(1, 55) = 28, p = .60$, respectively).

Our findings confirm that young bilingual children continue to lag behind their monolingual peers in vocabulary size, even when they are exposed to both languages early in life. However, speech development appears to be less susceptible to divided input, and bilingual children in this study matched their monolingual peers on a widely used measure of English articulation by age 5.

PRESENTATION 2:**“Where there’s a will, there’s a way”: The role of aptitude, motivation and socio-linguistic background on language proficiency at the end of French Immersion in Canada**

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Over the past decade French immersion (FI) programs in Canada have continued to increase in popularity. The expected French language outcomes are the same for both Early and Late FI programs, yet it is commonly believed that an early start to language learning will lead to a greater level of second language proficiency. Research in the context of FI programs has not always supported this view. A variety of possible factors have the potential to influence second language learning; however, foreign language aptitude and motivation have been found to be the most consistent predictors of second language success.

We compared the French and English language proficiency of Early and Late FI students nearing the time of high-school graduation (at the end of Grade 11). Four domains of language proficiency were examined in English and French: receptive vocabulary, grammar, listening comprehension, and pronunciation. Results demonstrated no significant differences between Early FI and Late FI groups on the French language measures, suggesting evidence against the notion that an early start to language learning will lead to better outcomes.

Subsequently the sample was divided by home-language into a group of bilinguals (those who spoke only English at home) and a group of multilinguals (those who spoke a language other than English and/or French at home). These analyses revealed that multilinguals performed as well as, and on some measures better than bilinguals in both languages, with the exception of English pronunciation. Regression analyses revealed that higher language aptitude and motivation to learn a foreign language observed in the multilingual group were factors that explain these results. Findings suggest language aptitude relates to French proficiency regardless of age of onset, and combined with motivation and socio-linguistic background is a better predictor of foreign language proficiency than age or amount of time spent learning a language.

PRESENTATION 3:**How maternal education influences the linguistic environment supporting migrant children’s L2 lexical and syntactic development**

Tamara SorensonDuncan, University of Alberta, Canada, sorensonduncan@ualberta.ca/ **Johanne Paradis**, University of Alberta, Canada, johanne.paradis@ualberta.ca

The interdependencies between proximal (e.g., language use at home) and distal (e.g., maternal education) input factors as determinants of bilingual development are not well understood, even though their independent effects on children’s development have been studied (Hoff, 2006). We examined the relationship between maternal education and proximal input factors, and in turn, their impact on migrant children’s English L2 development (e.g., Bridges & Hoff, 2014; Scheele, Leseman, & Mayo, 2010). We asked: (RQ1) What input factors predict individual differences in children’s L2 lexical and syntactic abilities? (RQ2) How is maternal education associated with these input factors?

Eighty-nine Canadian immigrant/refugee children (age=5;0, diverse L1s) completed a story-telling task. Input information was gathered through a parental interview. (RQ1): Logistic regression modelling revealed that lexical diversity and complex syntax were positively predicted by: family size, amount of English spoken by the mother, the child and the siblings, and length of exposure to English outside the home. (RQ2): Linear regression modelling revealed that family size and amount of English spoken by the mother were predicted by an interaction between maternal education and immigration status. For immigrant families, higher levels of education were associated with less English use and smaller families. In the refugee group, higher levels of education were associated with more English use and larger families. Maternal education did not predict English use by the child or siblings directly; however, maternal education predicted mothers’ English use, which in turn, predicted English use by the children and their siblings. Higher maternal education was associated with greater English fluency, and mothers with greater fluency spoke English to their children more often.

We conclude that there is a complex relationship between proximal and distal input factors. A complete understanding of how children’s linguistic environment determines their L2 development requires a multi-level approach.

References

Bridges, K.* & Hoff, E. (2014). Older sibling influences on the language environment and language development of toddlers in bilingual homes. *Journal of Applied Psycholinguistics*, 35, 225-241.

Hoff, E. (2006) How social contexts support and shape language development. *Developmental Review*, 26, 55-88.

Scheele, A. F., Leseman, P. P., & Mayo, A. Y. (2010). The home language environment of monolingual and bilingual children and their language proficiency. *Applied Psycholinguistics*, 31, 117-140. Presentation 4:

PRESENTATION 4:

How the language in which mothers are educated influences the language growth of bilingual children in immigrant families

Erika Hoff, Florida Atlantic University, U.S.A. ehoff@fau.edu / **Andrea Burridge**, Houston Community College, U.S.A. agburridge@gmail.com

Multiple studies of Spanish-English bilingual children in the U.S. have found that maternal education predicts English outcomes, but not Spanish outcomes. The present study asked whether the consequences of maternal education in bilingual samples might depend on the language in which mothers were educated. Education accomplished in English might not affect children's acquisition of Spanish, and vice versa.

Ninety-two U.S. born children of immigrant parents participated. Their mothers' reported their highest level of education achieved in Spanish and in English. Mothers also provided estimates of the relative use of English and Spanish in the home. Children's productive English and Spanish vocabularies were assessed at 6-month intervals from the age of 2 ½ to 5 years.

Four separate multilevel models tested the effects of level of maternal education in English and in Spanish on children's growth in English and Spanish expressive vocabulary, with effects of input balance in the home statistically removed. The findings were that mothers' level of education in English predicted children English skills, but not their Spanish skills. Mothers' level of education in Spanish was a marginally significant predictor of children's Spanish skills, but not their English skills.

This evidence of language specific effects of maternal education on child language suggests education benefits child language via its influence on

how mothers use language, rather than through a language-general mechanism such as increasing mothers' awareness of the value of talk to children. The smaller effect of education in Spanish on Spanish outcomes suggests the hypothesis that cultural factors act as a moderator of relations between maternal education and child language. Compared to European-American parenting, Hispanic parenting is less aimed at encouraging children's expressive skills across levels of education. Studies of comprehension skills may better reveal what Hispanic children know and the factors that support Spanish language growth.

DAY
5

FRIDAY, 21ST

14:00-16:00,

AMPHI JEAN-BAPTISTE SAY

SYMPOSIUM

Contributions of parent-child interactions to child language outcomes in diverse samples

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DISCUSSANT: Meredith Rowe, Harvard University Graduate School of Education Cambridge, U.S.A., meredith_rowe@gse.harvard.edu

A large body of research highlights the relationship between specific styles of parent-child interaction and child language development, particularly during the first few years of life (Rowe, 2012; Tamis-LeMonda & Bornstein, 2002). However, studies examining the effectiveness of interventions aimed at promoting parent language input and interaction styles to improve child language outcomes in population-based samples have found little effect (Wake et al, 2011). Thus, identifying specific types of child-directed speech and styles of parent-child interactions that promote language development and are most amenable to change in population-based samples could inform the content and targeting of early intervention strategies. The Presentations in this symposium examine specific parental language input and the quality of parent-child interactions in different populations, including slow-to-talk toddlers, toddlers with cochlear implants and infants from backgrounds of adversity.

The first Presentation reports findings from a community-based study examining the relationship between maternal language input and child language outcomes in a sample of slow-to-talk toddlers and also looks at how the quality of the interaction may mediate these associations. The second Presentation examines the contribution of both parental language input and quality of parent-child interactions to child language outcomes, but in a sample of infants and toddlers with severe to profound hearing loss who have cochlear implants.

The third Presentation uses data from a large cohort of mother-child dyads experiencing adversity

to identify the extent to which specific maternal verbal behaviours at 12 months predict language outcomes at 24 months. The final Presentation reports findings from a qualitative study utilising this sample of mother-child dyads to explore parents' experiences of being videotaped during mother-child free-play, collected as a measure of parent-child interaction. Given observational techniques are invaluable for elucidating specific parent behaviours and styles within parent-child interactions, this study highlights the value of considering the experiences of the participant.

References

Rowe, M. (2012). A longitudinal investigation of the role of quantity and quality of child-directed speech in vocabulary development. *Child Development*, 76, 763-782.

Tamis-LeMonda, C. S., & Bornstein, M. H. (2002). Maternal responsiveness and early language acquisition. *Advances in Child Development and Behavior*, 29, 90-129.

Wake M, Tobin S, Girolametto L, et al. (2011). Outcomes of population based language promotion for slow to talk toddlers at ages 2 and 3 years: Let's Learn Language cluster randomised controlled trial. *BMJ*, 2011; 343:d4741

PRESENTATION 1:

Maternal communicative behaviours and interaction quality as predictors of child language development: A prospective community-based study of slow-to-talk toddlers

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This study builds on previous findings that maternal responsive behaviours used with slow-to-talk toddlers are associated with child language skills at 24- and 36-months. It asks what other maternal behaviours are associated with child language skills, and does interaction quality mediate these associations? In a prospective community-based study of

196 children who were slow-to-talk at 18-months, language was assessed at 24- and 36-months using the PLS-4 and at 48-months using the CELF-P2. Mothers were filmed playing with their 24-month-old child for 15 minutes. Praise, missed opportunities, intrusive re-directs (Akhtar et al, 1991) and child compliance with re-directs during the middle 10 minutes were coded using Observer XT©. Conversational interaction quality was operationalised using a modified version of the “Fluency and Connectedness” (FC) scale (Hirsh-Pasek et al, 2015). FC rates the conversational flow and balance of turn-taking between mother and child. Linear regression models were fitted to explore the associations between maternal behaviours and language scores at each age, controlling for potential confounders. FC was fitted as an interaction term, and simple slopes explored. Higher rates of intrusive re-directs were associated with poorer language scores concurrently (e.g. receptive language: effect size [ES]: -0.41, 95% CI [-0.74, -0.08]) and longitudinally (e.g. 48m receptive language ES: -0.66 [-0.99, -0.33]), regardless of child compliance, and after controlling for confounders. Missed opportunities and praise were not associated with language. FC was associated with language scores (e.g. 48m receptive language ES: 0.18 [0.08, 0.27]). The association between re-directs and language was mediated by FC (e.g., 24m receptive language, $F(2, 190) = 21.0, p=0.018$). We conclude that mother-child interactions containing frequent intrusive re-directs may be predictive of slow-to-talk toddlers at risk of persistent language difficulties, particularly in low quality interactions. These data highlight the importance of considering mother-child conversational interaction quality in interventions as well as discrete behaviours.

References

Akhtar, N., Dunham, F., & Dunham, P.J. (1991). Directive interactions and early vocabulary development – the role of joint attentional focus. *Journal of Child Language*, 18(1):41-9.

Hirsh-Pasek, K., Adamson, L.B., Bakeman, R., Tresch Owen, M., Michnick Golinkoff, R., Pace, A., Yust, P.K.S., & Suma, K. (2015). The contribution of early communication quality to low-income children’s language success. *Psychological Science*, 26(7) 1071–1083.

PRESENTATION 2:

Impact of parent interaction and language input on the communicative development of infants with cochlear implants

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The social environment shapes a hearing child’s language development (Hoff, 2006; Weisleder & Fernald, 2013); the types of caregiver-child interactions account for some of the variability in language input, which has an impact on children’s vocabulary development. Language outcomes for young children with cochlear implants (CIs) have also been associated with the social context (Cruz et al, 2013). This Presentation reports on data from 35 children with severe to profound hearing loss who have CIs; they were recruited between the ages of 6 to 21 months prior to implantation. We used the Infant Growth Development Indices (IGDI) to identify specific features of parental input and parent-child interactions that impacted on the child’s communicative development. The in-home observation sessions were every 3 months for 18 months. Timed specified activities between parent and child were videorecorded for later coding. The Early Communicative Index component of the IGDI provides data on the child’s use of gesture, vocalisations, single words and multiple word utterances produced in a play session. The Early Parent-Child Interaction component provides measures of parent and child language and behaviour during four other activities. The measures are generated from examples of: caregiver facilitators (e.g., descriptive language, conveys acceptance and warmth, follows child’s lead), caregiver interrupters, engagement (e.g., positive social feedback, sustained engagement) and child distress. Initial results show strong correlations between the observed use of gestures using the ECI and parental report of gesture use. In addition, significant associations between use of descriptive language in the input and children’s gesture use and early vocabulary were found. Further analyses on the association between the IGDI measures and the children’s communicative development will add to these results. The findings will expand on prior research and help explain some of the variability in early vocabulary development for young children with CIs, which is likely to impact on their later language.

References

Hoff, E. (2006). How social contexts support and shape language development. *Developmental Review*, 26, 55-88.

Weisleder, A. & Fernald, A. (2013). Talking to children matters: Early language experience strengthens processing and builds vocabulary. *Psychological Science*, 24(11), 2143-52. doi: 10.1177/0956797613488145.

Cruz, I., Quittner, A.L. Marker, C., DesJardin, J.L., & the CDaCI Investigative Team. (2013). Identification of Effective Strategies to Promote Language

in Deaf Children with Cochlear Implants. *Child Development*, 84(2), 543–559. doi: 10.1111/j.1467-8624.2012.01863.x

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PRESENTATION 3:

Associations between maternal verbal behaviours and child language skills in a cohort of mothers and their children experiencing adversity

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Evidence suggests that children living in adversity are at greater risk of poorer language than their peers (Law et al, 2011) with the quality of parental interactions potentially mediating this association (Lugo-Gil & Tamis-LeMonda, 2008). To date, studies typically measure the mediatory impact of over-arching parenting styles, inclusive of multiple behaviours. It remains difficult therefore to discern which particular aspects of the interaction facilitate language acquisition (Hirsh-Pasek et al, 2015). This study aimed to bridge the gap by identifying the extent to which specific, modifiable maternal behaviours at 12-months predict child language at 24-months, in a large cohort of mother-child dyads experiencing adversity. Mother-child free-play videos were collected from women in Victoria and Tasmania, Australia at 12-months ($n=249$) and 24-months of age ($n=unknown$). Maternal imitations, responsive labels, responsive questions, unsuccessful redirectives, successful redirectives and prohibitions were coded at 12-months; the quality of the mother-child interaction was also measured. At 24-months, child language outcomes were calculated from verbatim transcripts, including amount of utterances, mean length of utterance (MLU), intelligibility, total words and unique words. Preliminary findings suggest that maternal imitations are positively associated with child language. Conversely, both maternal redirectives appear negatively associated with language outcomes. Furthermore, within this sample, the quality of the interaction at 12-months appears to moderate these

associations. This information is important for paediatric speech pathologists in augmenting current knowledge of risk and protective factors related to early language in at-risk populations. The findings suggest that frequent use of maternal imitations, within high-quality mother-child dyads, may help mediate the impact of adversity on early language trajectories. On the other hand, frequent use of re-directives in early infancy may be a risk factor for poorer child language. The findings also highlight the importance of holistic assessment of early communication skills, reinforcing the value of assessment of maternal behaviours *and* mother-child interactions, in addition to child language skills.

References

Law, J., McBean, K., & Rush, R. (2011). Communication skills in a population of primary school-aged children raised in an area of pronounced social disadvantage. *International Journal of Language and Communication Disorders*, 46, 657–664.

Lugo-Gil, J. & Tamis-LeMonda, C. S. (2008). Family resources and parenting quality: links to children's cognitive development across the first 3 years. *Child Development*, 79(4), 1065–85.

Hirsh-Pasek, K., Adamson, L. B., Bakeman, R., Tresch Owen, M., Michnick Golinkoff, R., Pace, A..... Suma, K. (2015). The contribution of early communication quality to low-income children's language success. *Psychological Science*, 26(7) 1071–1083

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PRESENTATION 4:

Parents' experiences of parent-reported and direct observational assessments: How can we decrease discomfort and increase validity?

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The strengths and limitations of parent-reported surveys and direct parent-child observations are well-documented (Wysocki, 2015; Aspland & Gardner, 2003). However, little is known about how par-

ents and children experience these assessments, or the extent to which observations reflect “natural” parent-child behaviours. This study aimed to examine parents’ subjective experiences of parent-reported surveys and videotaped parent-child observations which assessed child language and parent-child interactions. Ten parents of children aged 24 months were recruited from a cohort of families experiencing social adversity. After completing both assessments, participants took part in semi-structured individual interviews. Thematic analysis (Green et al, 2007) revealed five themes, including (i) concerns about being judged; (ii) the observation as an unnatural scenario; (iii) the survey as an opportunity to reflect; (iv) factors affecting parent-child comfort and discomfort; and (v) the bigger picture: participating in research. Parents voiced concerns about how the researchers may view their parenting behaviours and their child’s behaviour and development. Many parents felt the structured requirements of the observation contributed to unnatural interactions. The survey was viewed as a welcome opportunity to reflect on parenting skills, the parent-child relationship and the child’s development. Factors which eased discomfort included perceptions of the researcher as friendly and non-judgemental, and familiarity with video technologies in the home environment. Parents considered “the bigger picture” as a means of minimising discomfort, such as knowing the findings were confidential and that they were contributing to science. We discuss strategies and recommendations for both clinicians and researchers seeking to minimise discomfort and enhance the validity of data collected from parents and their young children.

References

- Wysocki, T. (2015). Introduction to the Special Issue: Direct Observation in Pediatric Psychology Research. *Journal of Pediatric Psychology*, 40(1), 1-7. doi:10.1093/jpepsy/jsu104
- Aspland, H., & Gardner, F. (2003). Observational measures of parent-child interaction: An introductory review. *Child and Adolescent Mental Health*, 8(3), 136-143. doi: 10.1111/1475-3588.00061
- Green, J., Willis, K., Hughes, E., Small, R., Welch, N., Gibbs, L., & Daly, J. (2007). Generating best evidence from qualitative research: the role of data analysis. *Australian and New Zealand Journal of Public Health*, 31(6), 545-550. doi: 10.1111/j.1753-6405.2007.00141.x

POSTER

ZONE 1

01 Children with autism spectrum disorder use common ground to comprehend ambiguous requests

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Children with autism spectrum disorder (ASD) frequently appear to either over- or under-estimate the knowledge to which their conversation partner has access. No-one has previously investigated this phenomenon in terms of how they interpret conversation. We compared 5-8-year-olds with ASD (n=22) with typically developing children (n=22) matched for age, language scores and non-verbal IQ. Both groups performed well above chance. A control condition ruled out the possibility that a correct response was selected based on mere co-presence rather than shared experience. Verbally-fluent 5-8-year-olds with ASD can take shared experiences with specific individuals into account when interpreting potentially ambiguous utterances.

02 Deaf Children's Typical and Atypical Bilingual Development in American Sign Language (ASL) and Written English

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For some Deaf children simultaneously acquiring a signed and a spoken language, research shows that there is a correlation between typical/atypical abilities in one language and typical/atypical abilities in the other [British Sign Language and British English [1]; American Sign Language (ASL) and American English [2]]. Our research is unique in

investigating the relationship between typical (i.e., following expected milestones) and atypical (i.e., impaired) signed and written language. We targeted 40 Deaf children (8-14 years) learning ASL and written English.

Research questions: (1) Is there evidence of typical and atypical language usage on tests of ASL and written English? and (2) Do teachers' perceptions of Deaf students' ASL and written English correspond to students' performance on tests of ASL and English literacy?

Methods: Teachers completed a questionnaire and identified 30 Deaf children who were judged to have typical ASL and written English abilities and 10 children who were judged to exhibit atypical ASL and written English abilities. Performance on tests of non-verbal IQ and motor ability ruled out the presence of significant co-occurring conditions. ASL abilities were assessed using a norm-referenced test of ASL across four linguistic domains: phonology; lexicon; morphology/syntax; and pragmatics/discourse. English literacy was measured using adapted subtests from two standardized tests of English literacy. We analyzed patterns of accurate linguistic production and consistent errors in ASL and written English.

Results: The results demonstrated a significant correlation between (1) the teacher-identified typical and atypical ASL and written English performance and (2) ASL and written English composite scores. The results are important for (a) further developing a theoretical understanding of the effects of modality and language on communication, (b) assessing language and diagnosing language impairments in signed and written language and (c) designing educational policies and programs for Deaf students with language impairments.

References

Mason, K., Rowley, K., Marshall, C.R., Atkinson, J.R., Herman, R., Woll, B., & Morgan, G. (2010). Identifying specific language impairment in Deaf children acquiring British Sign Language: Implications for theory and practice, *British Journal of Developmental Psychology*, 28, 33-49.

Quinto-Pozos, D., Forber-Pratt, A.J., & Singleton, J.L. (2011). Do developmental communication disorders exist in the signed modality? *Perspectives From Professionals. Language, Speech, And Hearing Services In Schools*. 42, 423-443.

03 Speech and language outcomes of three-year-old Finnish children with hearing loss

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Several studies have shown that despite early identification, hearing aid fitting or implantation, some children with HL lag behind their age-peers with NH before school-age and also during elementary school (Ching et al., 2013; Fitzpatrick, Crawford, Ni, & Durieux-Smith, 2011; Tomblin et al., 2015). Several factors have been found to be associated with speech and language development (e.g. early HA fitting, systematic HA use, age at first CI activation, maternal education).

The aims of this study were to investigate early language and speech outcomes in Finnish-acquiring children with 1) mild-to-severe HL who use bilateral hearing aids (HAs), and 2) severe-to-profound HL who use bilateral cochlear implants (CIs), 3) to compare their language skills to those of age-peers with NH, 4) to compare children with HAs and CIs, and 4) to analyze the associations between background factors and outcomes. The participants were 38 children with HL (19 HA-users; 19 CI-users). There were no differences in the distribution of age, gender and aided hearing level between the children. Children's spoken language comprehension and lexical and phonological skills were assessed at the chronological age of three years.

The results showed that majority of children with HAs and CIs had spoken language comprehension skills within the normal age-range at age three, but still 26% of children fell below age-norms. Over 60% of the children with HAs and over 30% of children with CIs fell below the age-range in lexical skills. Over 30% of children with HAs, but only 16% of children with CIs fell below the age-range also in phonological skills. Maternal level of education and implementation of early intervention had main effects for outcomes at age three. (This research was funded by the Academy of Finland.)

References

Ching, T. Y., Dillon, H., Marnane, V., Hou, S., Day, J., Seeto, M., Yeh, A. (2013). Outcomes of early- and late-identified children at 3 years of age: Findings from a prospective population-based study. *Ear & Hearing*, 34, 535–552.

Fitzpatrick, E. M., Crawford, L., Ni, A., & Durieux-Smith, A. (2011). A descriptive analysis of language and speech skills in 4- to 5-yr-old children with hearing loss. *Ear & Hearing*, 32, 605–616.

Tomblin, J. B., Harrison, M., Ambrose, S. E., Walker, E. A., Oleson, J. J. & Moeller, M.P. (2015). Language outcomes in young children with mild to severe hearing loss. *Ear & Hearing*, 36, 76S–91S.

04 Language comprehension in children, adolescents and adults with Down syndrome

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Introduction: Controversies exist regarding the developmental profile of language comprehension abilities in Down syndrome (DS). Some studies have found evidence of ongoing development into adulthood (Sanoudaki & Varlokosta 2015) whereas others have reported the building of a plateau in late adolescence (Laws & Bishop 2004) and again others have described declines starting as early as the age of about 20 years (Chapman et al. 2002). The aim of the present study was to shed further light on the question if receptive language skills change from childhood/adolescence to adulthood.

Method: 58 individuals with DS participated in the study: 31 children and adolescents (chronological age [CA]: 4;6–19;0 years; nonverbal mental age [MA]: 2;11–6;5 years, one exception: > 7;11) and 27 adults (CA: 20;8–40;3 years; MA: 3;3–6;7 years, two exceptions: > 7;11). Language comprehension was assessed using the German adaption of the TROG, which tests a broad array of grammatical structures.

Results: There was no significant correlation between comprehension performance and CA in the overall sample ($r(56) = .133, p = .321$). However, separate analyses for the subgroups of children/adolescents and adults yielded a significant result for the former subgroup ($r(29) = .521, p = .003$) but not for the latter ($r(25) = -.113, p = .574$). There was a strong positive correlation of TROG scores and MA ($r(53) = .552, p < .001$). Qualitative analyses showed various limitations in the receptive abilities of adults with DS. Difficulties increase with sentence length and with grammatical complexity.

Conclusion: The results suggest that the development of receptive language abilities comes to an end in the transition from adolescence to adult-

hood. It seems that thereafter a plateau is reached in grammar comprehension and the abilities are preserved throughout the 20s and 30s. The results further indicate that comprehension performance is related to nonverbal cognitive abilities and to linguistic complexity.

References

Chapman, R. S., Hesketh, L. J., & Kistler, D. J. (2002). Predicting longitudinal change in language production and comprehension in individuals with Down syndrome: hierarchical linear modeling. *Journal of speech, language, and hearing research* : JSLHR, 45(5), 902–915.

Laws, G & Gunn, D. (2004): Phonological memory as a predictor of language comprehension in Down syndrome: a five-year follow-up study. *Journal of Child Psychology and Psychiatry*, 45 (2), 326–337.

Sanoudaki, E., & Varlokosta, S. (2015). Pronoun comprehension in individuals with Down syndrome: the role of age. *International Journal of Language & Communication Disorders*, 50(2), 176–186.

05 Assessing phonological memory in children with speech errors: are meaningless syllable strings really meaningless?

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Non-word repetition (NWR) is widely accepted as a reliable measure of phonological memory in children. Furthermore, as suggested by the relationship between NWR performance and lexicon size, young children draw from pre-existing lexical representations to support the phonological loop during these tasks (Gathercole, 2006). If the goal of NWR is to provide a valid measure of phonological storage, speech production must be controlled so that speech sound errors do not inadvertently affect results. The Syllable Repetition Task (SRT; Shriberg et al., 2009) provides an alternate non-word repetition paradigm that uses only four early-developing consonants and one vowel to construct stimuli. Although the limited phonemic repertoire effectively controls for consistent articulation errors, do children process these seemingly meaningless and redundant syllable strings as word-like items?

Two experimental conditions were created to test whether children treat SRT items as word-like: the first condition consisted of unstressed items from the original SRT, whereas the second condition marked prosodic stress through both intensity

and vowel quality. Participants were 4-5-year-olds with similar language but differing articulation/phonology profiles, resulting in 42 high-average, 11 low-average, and nine children with disordered speech production. Items from the two conditions were pseudo-randomized and presented through headphones.

Results demonstrated a statistically significant difference in repetition accuracy between groups as well as a positive correlation between speech production accuracy on the SRT and a picture-naming task, suggesting that the SRT detected phonological memory differences as designed. Notably, there was no significant main effect of prosodic condition across participants and no interaction between stress and experimental group. These results are consistent with Shriberg et al.'s (2009) assertion that SRT items are likely interpreted as word-like due to co-articulatory effects and falling intonation contour. Thus, the SRT has significant potential as an executive function task that controls unwanted artifacts in younger and clinical populations.

References

Gathercole, S. (2006). Nonword repetition and word learning: The nature of the relationship. *Applied Psycholinguistics*, 27, 513–543.

Shriberg, L, Lohmeier, H., Campbell, T., Dollaghan, C., Green, J., & Moore, C. (2009). A nonword repetition task for speakers with misarticulations: The Syllable Repetition Task (SRT). *Journal of Speech, Language and Hearing Research*, 52, 1189–1212.

06 Neurophysiological evidence for the influence of phonological and semantic neighbourhood densities on word production in children

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'Neighbourhood density' refers to the phonological and semantic connectedness of words in the mental lexicon. Phonological neighbourhood density (PND) in particular has been identified as a predictor of vocabulary development (Storkel, 2009). For most children, as the number of low PND words increases so does the size of the expressive vocabulary, but late talker children seem to be unable to make

this transition since they continue to use high PND words although their receptive vocabulary is comprised of both high and low PND words. These findings indicate that the production of high PND words may place a reduced demand on underlying processes of speech production compared to low PND words. The present research addressed this issue by investigating the effect of PND on the cognitive processes involved in word production in children using electroencephalography (EEG). EEG allows the tracking of underlying processing differences across words during word production (Laganaro, Tzieropoulos, Frauenfelder, & Zesiger, 2015). The influence of semantic neighbourhood density (SND) was also examined, to reveal whether words with different phonological densities are processed differently depending on their semantic density. To this end, EEG data were recorded from healthy English speaking 5-year-old children who named pictures varying in PND and SND. Findings indicate that children process low PND words with more cognitive effort than high PND words during the underlying process of phonological encoding. An interaction between SND and PND during phonological processing suggests a facilitative influence of high SND when PND is low. These findings show that PND and SND modify the underlying processes of word production in children, providing new insights into the impact of PND and SND on information retrieval, which can support the development of adequate therapeutic interventions.

References

Laganaro, M., Tzieropoulos, H., Frauenfelder, U. H., & Zesiger, P. (2015). Functional and time-course changes in single word production from childhood to adulthood. *NeuroImage*, 111, 204–214.

Storkel, H. L. (2009). Developmental differences in the effects of phonological, lexical and semantic variables on word learning by infants. *Journal of Child Language*, 36(2), 291–321.

07 Tracking of speech rhythm by brain oscillations: What happens in children with typical and atypical language development? A magnetoencephalography (MEG) study.

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Recent works suggest a close correspondence between speech rhythm and brain oscillations (1). Theta band (4-7 Hz) oscillations in auditory cortical regions synchronize to slow modulations in the speech amplitude envelope (characterizing syllabic rhythm); this would allow segmentation of the signal into meaningful linguistic units (2). Whether such coupling occurs in typically developing (TD) children and in children with Specific Language Impairment (SLI) has not yet been investigated. Using a 275-channel whole-head MEG system (CTF), we recorded brain activity of 14 French native, normal-hearing TD children and 12 children with SLI (aged 8-13), while they were listening to 150 sentences naturally produced at a normal rate (6.76 syllables/s) and 150 sentences at a faster rate (9.15 syllables/s). Coupling (coherence) between MEG signals and speech amplitude envelope in each rate condition was computed with Fieldtrip toolbox. Source-level analysis was performed with beamforming and non-parametric randomization statistics were used for group statistical analysis. Results in TD children reveal significant entrainment of theta (4-7 Hz) oscillations in right auditory cortex to the amplitude envelope of normal rate speech; interestingly, entrainment occurs in left (pre)motor regions when speech is naturally accelerated. In addition, left anterior temporal cortex synchronizes its oscillatory activity to normal rate speech envelope in a frequency band matching sentences' average syllabic rate (5.6-7.6 Hz). No such coupling is observed for the fast rate condition in the corresponding frequency band (8-10 Hz). In SLI children, no significant cortico-acoustic synchronization is found in the theta band in the normal and fast rate conditions. However, coupling to normal rate speech seems to occur in the fronto-temporal cortex in the frequency range centered on mean normal syllabic rate (5.6-7.6 Hz), although it is right-lateralized and reduced (i.e. non-significant) as compared with TD children. These findings provide novel insights into the oscillatory dynamics that mediate natural speech perception in children with typical and atypical language development, showing that oscillatory activity in temporal cortex of TD children synchronizes to the speech signal at a normal rate. When speech is uttered faster, auditory cortical oscillations do no longer track speech rate, probably due to ongoing maturational processes; yet coupling occurs in left (pre)motor regions, in agreement with the role of the dorsal stream in degraded speech comprehension (3) as well as with the presence of endogenous theta oscillations in premotor regions (4). Our first results in SLI children also suggest atypical oscillatory coupling to speech in these children, which may, at least partly, underlie the rhythm-processing deficits previously reported in SLI (5).

References

Giraud, A-L. & Poeppel, D. (2012). Cortical oscillations and speech processing: emerging computational principles and operations. *Nature Neuroscience*, 15(4), 511-517.

Peelle, J. E. & Davis, M. H. (2012). Neural oscillations carry speech rhythm through to comprehension. *Frontiers in Psychology*, 3, 320.

Hickok, G. & Poeppel, D. (2007). The cortical organization of speech processing. *Nature Reviews Neuroscience*, 8(5), 393-402.

Giraud, A-L., Kleinschmidt, A., Poeppel, D., Lund, T. E., Frackowiak, R. S. J. & Laufs, H. (2007). Endogenous cortical rhythms determine cerebral specialization for speech perception and production. *Neuron*, 56, 1127-1134.

Corriveau, K. H. & Goswami, U. (2009). Rhythmic motor entrainment in children with speech and language impairments: tapping to the beat. *Cortex*, 45(1), 119-130.

08 Are children and adolescents with autism able to adapt their reading strategy to different reading goals?

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Reading comprehension difficulties are well documented in persons with autism spectrum disorder (ASD). However, the reasons underlying these difficulties are still open to discussion. Their ability to adapt reading strategies to the goals of reading a particular text is unclear. In this study, we recorded participants' eye movements in order to investigate the influence of different reading goals on the reading strategies in typically developing (TD) children and adolescents and peers with ASD, while reading texts and answering questions. A group of participants with ASD ($n = 22$), and TD peers ($n = 22$), matched on intelligence, oral language and reading skills, read three stories under three different reading goals conditions: entertainment, study and search in the text for questions presented in advance. Each text required participants to answer questions that could either be relevant or not for the comprehension of the text. Results showed no differences between groups in accuracy in question answering. However, differences between groups were found in the reading strategy used to read texts and questions. The TD group read more slowly,

made more frequent and longer fixations in the text for study compared to the text read for entertainment, and read more slowly and made more frequent fixations on the questions answered after reading for entertainment compared to the questions answered after studying. These differences in reading the texts and the questions were not found in the ASD group. This study showed that the TD group adopted different reading strategies in reading texts and questions based on different reading goals. The TD group read longer, but answered faster to the questions of the text for study. By contrast, the ASD group did not change their reading behavior according to the reading goal, showing less of a tendency to adopt deep-level processing strategies when necessary.

09 Cartoon competitions: The effect of visual animacy on children's sentence processing

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Currently, it is unclear whether young children can use visual context to constrain their interpretation of sentences in a way similar to adults. This study examined how semantic animacy and visual features of the antecedent nouns constrain preschool-aged children's (age range: 48-53 months) interpretation of ambiguous pronouns. The semantic animacy of the subject and object nouns varied (i.e., animate animals vs. inanimate objects). We manipulated visual animacy by adding eyes and mouths to the inanimate images in half of the trials (e.g., for "There is the couch that the bunny phoned..." the image of the couch was manipulated). By tracking participants' eye movements to the images of the subject and object of the preceding sentence we observed how they interpreted the ambiguous agentive pronoun, "he" in a follow-up sentence.

Linear mixed effects models showed that when the object of the sentence was an inanimate noun, the subject was more likely to be considered as the pronoun referent in comparison to when both nouns were animate ($t=2.212$, $p=0.032$), thus illustrating an effect of semantic animacy on pronoun resolution. We further found an effect of visual animacy on processing when the subject was semantically inanimate, yet the object was animate. In this sentence type, without visual manipulation, there was an object preference. That is, the preference for subject to be pronoun referent lost to the preference for the animate noun to be pronoun referent.

However, adding facial features to the subject's image reduced the object preference in favour of a slight subject preference ($t=2.457$, $p=0.018$). This illustrates the participants used the visual cues of animacy when resolving the pronoun.

These results will be compared to offline, verbal responses regarding interpretation of the ambiguous pronoun and to adult eye-movement behaviours. Findings from this study provide insight to children's ability to process language situated in a visual-sensory context.

10 An intervention to increase educators' responsiveness to promote pupils' participation in class activities

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We present the results of an action-research study in a special education school, based on a reflection process with three educators and two researchers. The aim of the study was designing and implementing an intervention to increase educators' social and linguistic responsiveness and promoting pupils' communicative development. The participants were a teacher, a teaching assistant, a speech therapist and 8 pupils, aged 6 to 9 years, who had neurodevelopmental disorders (American Psychiatric Association, 2013).

The study comprised 3 phases:

1. Counselling programme implementation. The intervention consisted of 15 meetings over a 29-weeks period. Through a series of open questions inviting self-reflection, the participants discussed general thematic areas included in the social-interactionist perspective of communication and language development (Justice, 2004). Self-observation in the form of video recordings was used as a technique to improve educators' performance (van Es, Tunney, Goldsmith & Seago, 2014).

2. Parallel process monitoring. Three classroom performances of each educator interacting with a small-group of students were video-recorded during the counselling. They consisted of a communication and language session recorded in September (1st quarter), February (2nd quarter) and May (3th quarter).

3. Transcription, coding and analysis. 15-minutes of each recordings were transcribed and coded using an ad hoc category system, to analyse educators and pupils' performance.

The intervention exercised certain impact on the educators' responsiveness. The educators increased the amount of contingent talk addressed to the children and adopted a child-centred interaction style, which promoted extended turn talking. Along the intervention, they also used a well-balanced participation, increased their sensitivity to the children's communicative intentions and used more frequently language-modelling strategies to promote pupils' language development. Consistent with the bidirectional model of language influence (Sameroff & Fiese, 2000), while the educators were progressively incorporating part of the counselling recommendations, the pupils started to show higher levels of balanced participation, initiating more communicative turns, increasing their language productivity and using more diverse vocabulary.

References

van Es, E.A., Tunney, J., Goldsmith, L., & Seago, N. (2014). A framework for the facilitation of teachers' analysis of video. *Journal of Teacher Education*, 64(4), 340–356.

Justice, L. (2004). Creating language-rich preschool classroom environments. *Teaching Exceptional Children*, 37(2), 36–45.

Sameroff, A. J., & Fiese, B. H. (2000). Transactional regulation: The developmental ecology of early intervention. *Handbook of early childhood intervention*, 2, 135–159.

11 Using Webinar-Based Coaching to Support Rich Language Use in Preschool Classrooms

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Preschool programs play a critical role in supporting the language and literacy development of children, especially those from low-income communities. Yet, the benefits of preschool for low-income children are contingent upon the quality of teaching provided. Thus, countless initiatives have sought to provide professional development to preschool educators, often through coaching. Once removed from the research-context, however, coaching becomes costly for schools, and is, as a result, often unattainable by the programs most in-need. The

current study, thus, explored the effectiveness of webinar-based coaching as an alternative to in-person coaching for preschool teachers.

Participants were 43 preschool teachers of low-income children who received intensive coaching in a classroom storytelling program. Twenty-two teachers were trained via a coach who visited them at school at least six-times over the first 3-months of the school year. The remaining teachers received the same training via seven animated webinars that they could access as frequently as they desired, from any location, during the same period and beyond. All teachers were expected to implement the oral storytelling program for the remainder of the school year. The effectiveness of the coaching in supporting teachers' language practices was assessed via two direct observational measures of classroom climate (i.e., CLASS) and language use (i.e., LISn), as well as through the number of stories teachers shared and the strategies used when doing so. Children's (n= 240) language outcomes were also assessed via narrative and picture-description tasks. Preliminary analyses suggest that the two forms of coaching were equally effective in supporting classroom language practices. Moreover, teachers who received webinar-based coaching shared more stories and incorporated more strategies when doing so. Finally, children whose teachers received web-based training had more sophisticated and diverse vocabularies. Policy- and practices-based implications of webinar-based coaching to support teachers and children in under-resourced schools will be discussed.

12 Linguistic and Cultural Identity of D/deaf Adolescent Students from Culturally Diverse Communities

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D/deaf individuals represent a diverse group, whose sense of identity and cultural and linguistic practices varies significantly, and is influenced by multiple factors (Most et al., 2007). A society's socio-political and educational policies and practices have a profound effect on whether individuals can freely choose their cultural membership. Current US educational policies primarily promote a hearing culture, emphasizing the development of spoken-auditory English and limiting the role of signed language and Deaf culture (Hauser et al., 2010). Changes that reflect a sociocultural model would promote recognition of heterogeneity and a need for diverse teaching approaches (Cummins, 2009). To address

these issues, we investigated the cultural identity of D/deaf adolescent students (ages 12-20 years) and the extent to which current classroom practices reflect culturally sensitive pedagogy.

Research questions: (1) What are important factors in the evaluation of cultural and linguistic identity of D/deaf adolescent students? (2) What are teachers' perceptions regarding the training and support they have received in building cultural competency?

Methods: (1) We conducted a language and cultural identity survey and interview with D/deaf students within diverse educational programs, and analyzed cultural and linguistic profiles of students; (2) We surveyed teachers of the deaf and mainstream teachers regarding their perceptions and practices.

Results: Student responses extend our existing notions of heterogeneity to a more complex level of negotiating identities within the Deaf vs. hearing as well as mainstream vs. home cultures. In addition, results reveal specific linguistic and nonlinguistic factors to be strongly associated with cultural identity. Responses from classroom teachers indicate a need for improved teacher education. Teachers provided valuable feedback regarding specific kinds of needed support (e.g., communication liaisons). We discuss implications for practice from a socio-cultural model (Cummins, 2009), which emphasizes empowerment via: (a) identity investment, (b) employment of bi- or multilingual strategies, and (c) teacher education.

References

- Cummins, J. (2009). Pedagogies of choice: challenging coercive relations of power in classrooms and communities. *International Journal of Bilingual Education and Bilingualism*, 12(3), 261-271.
- Hauser, P. C., O'Hearn, A., McKee, M., Steider, A., Thew, D. (2010). Deaf Epistemology: Deafhood and Deafness. *American Annals of the Deaf*, 154(5), 486-492.
- Most, T. Wiesel, A., Blitzer, T. (2007). Identity and Attitudes towards Cochlear Implant Among Deaf and Hard of Hearing Adolescents. *Deafness and Education International*, 9(2), 68-82.

13 Speech+gesture combinations for and by infants in the Netherlands and Mozambique

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Speech+gesture combinations allow children to express a two-word idea when they may be unable to express themselves fully in the spoken modality (Butcher & Goldin-Meadow, 2000). The onset of speech+gesture combinations conveying different information seem to correlate strongly to the onset of two-word utterances in various cultures (Goldin-Meadow, 2009; Iverson & Goldin-Meadow, 2005), but these do not include non-Western cultures. In this research we investigate to what extent the emergence of speech+gesture combinations varies between a Western culture and a non-Western culture.

We analysed natural observations of 40 18-months-old infants from middle-class families in the Netherlands and from low SES families in rural and urban Mozambique. In particular, we explored cultural differences in the speech+gesture combinations addressed to and produced by infants. We analysed whether the gestures were semantically coherent with the verbal utterances, and for those utterances that were, to what extent the information conveyed in gesture and speech were complementary (e.g. pointing to an apple and saying “eat”).

We found that the speech+gesture combinations addressed to infants in the Netherlands were more often semantically coherent compared to those addressed to Mozambican infants. However, caregivers in rural Mozambique produced the highest proportion of complimentary speech+gesture combinations, followed by urban Mozambique and then the Netherlands. For infants’ productions, we excluded data from rural Mozambique, since infants hardly produced any intelligible speech. We found that in the Netherlands, infants produced more speech+gesture combinations, but the proportion of semantically coherent combinations was higher for urban Mozambican infants. Interestingly, urban Mozambican infants produced proportionally many more complimentary speech+gesture combination than Dutch infants.

To conclude, complimentary speech+gesture combinations seem to occur relatively more frequent and emerge earlier in Mozambique than in the Netherlands. Based on earlier research (Butcher & Goldin-Meadow, 2000) we could thus say that the onset of two word utterances is expected to occur earlier in Mozambique than in the Netherlands.

References

Butcher, C., & Goldin-Meadow, S. (2000). Gesture and the transition from one- to two-word speech: when hand and mouth come together. In D. McNeil (Ed.), *Language and gesture*. New York: Cambridge University Press.

Goldin-Meadow, S. (2009). How gesture promotes learning throughout childhood. *Child development perspectives*, 3, 106-111.

Iverson, J. M., & Goldin-Meadow, S. (2005). Gesture paves the way for language development. *Psychological science*, 16, 367-371.

14 Dimensions of the language-learning environment in early education classrooms: Associations with children’s language growth

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Many features of the early education classroom (ECE) environment are theorized to enhance young children’s language development, including the global language environment (e.g., teacher-child conversations), the data-providing features of teachers’ talk (e.g., teachers’ use of complex syntax), and teachers’ use of specific conversational strategies that promote children’s participation in conversations (e.g., recasts). Are these various aspects of the ECE environment a single dimension, or several? If the latter, are there certain dimensions that are most influential to children’s language growth over time?

This research involved comprehensive assessment of the language-learning environment of 49 ECE classrooms serving low-income children in the United States. A total of eight measures represented the language-learning environment, including scales from the Classroom Assessment Scoring System (Pianta, La Paro, & Hamre, 2004), transcriptions of teachers’ talk during small-group play which were coded using the Hanen Centre’s Language Interaction Rating Scale (Girolametto & Weitzman, 2002). We used exploratory and confirmatory analysis to empirically examine the dimensionality of the language-learning environment, finding there to be three distinct dimensions corresponding to global language environment, data-providing features, and conversational strategies. We then used growth curve modelling to examine which of these dimensions explained variance in children’s growth in grammar and vocabulary skill over an 18-month period. Between-classroom variance in grammar skill was negligible within the hierarchical linear models, therefore our analyses focus on explaining variance in vocabulary growth as predicted by three dimensions of the classroom environment. Results showed that only teachers’ use of conversational strategies predicted children’s vocabulary growth. Findings are important for identifying those characteristics of young children’s ECE settings that support their language growth over time.

References

Girolometto, L., & Weitzman, E. (2002). Responsiveness of child care providers in interactions with toddlers and pre-schoolers. *Language, Speech, and Hearing Services in Schools*, 33, 268-278.

Pianta, R., La Paro, K., & Hamre, B. (2004). *Classroom Assessment Scoring System-PreK*. Baltimore, MD: Brookes Publishing.

15 Shift of Japanese Mother's Infant-/Child-Directed Speech

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Parental language input is thought to be one powerful source for child language development. Although previous studies have revealed the characteristics of Infant-/Child-Directed Speech (IDS/CDS) and its effects on child language acquisition (Soderstrom, 2007; Saint-Georges, et al., 2013), insufficient attention has focused on the changes of parental IDS/CDS in other properties except acoustic characteristics (Narayan, & McDermott, 2016). Since parents eventually change their ways of speech from IDS to ADS in such domains as lexicon and syntax, describing the linguistic shift of IDS/CDS is critical and would contribute to clarify the issue of how the change of parental input influences child's lexical and syntactic development.

The present study focused on the change of the lexical and syntactic characteristics of IDS/CDS and measured how parents talked to their children in a structured production-elicited task. 60 Japanese-speaking mothers with children from 1 to 3 years of age were shown 20 animations in which an agent performed an action and asked to explain its content to their children. Their utterances were transcribed and analyzed in terms of word use, sentence complexity, and length.

Our results showed that mothers come to use less IDS words, and more verba when their children were 2-3 years of age. They also come not to omit case marker particles, which is one feature of Japanese IDS/CDS. The increases of the mean length of utterances (MLU) and their standard deviation during the same age range suggest that mothers also increased their sentence length and complexity. In addition, Structural Equation Modeling revealed how MLU changes in relation to word use by children's age. These results suggest that caregivers lexically and syntactically change their ways of speech from IDS/CDS to ADS step by step based on

child development and provide significant implications for the mechanism of child language development.

References

Narayan, C. R., & McDermott, L. C. (2016). Speech rate and pitch characteristics of infant-directed speech: Longitudinal and cross-linguistic observations. *The Journal of the Acoustical Society of America*, 139(3), 1272-1281.

Saint-Georges, C., Chetouani, M., Cassel, R., Apicella, F., Mahdhaoui, A., Muratori, F., & Cohen, D. (2013). Motherese in interaction: at the cross-road of emotion and cognition? (A systematic review). *PLoS one*, 8(10), e78103.

Soderstrom, M. (2007). Beyond babytalk: Re-evaluating the nature and content of speech input to preverbal infants. *Developmental Review*, 27(4), 501-532.

16 Measuring Interaction and Language-Promoting Strategies Between Pre-schoolers and Early Childhood Educators in French Minority Language Early Child Care Settings.

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Preschool-aged children increasingly attend early child care settings. In Northern Ontario, minority French language communities have seen an attendance influx of children whose primary language is a language other than French. Replicating the methodology of Girolometto, et al (2003) on children attending an English-speaking child care centre, this exploratory study investigated the outcome of in-service training on both the impact of exposure to the French-language, within the child care centre and, concomitantly, language facilitation strategies of the child care providers in day care centres. Sixteen caregivers, working in four different early child care settings in the Greater Sudbury area were randomly assigned, by centre, to either the experimental or control groups. Trained facilitators (non-SLP) offered a 14-week interaction and language facilitation program to teach the participants child-centered strategies. These key strategies, along with interaction promotion and language promoting strategies were compared pre- and post-program (immediately following the program and 9 months follow-up). Furthermore, peer interaction facilitation was measured between the children as the in-service training model also targeted this strategy. Language transcriptions were analyzed to

measure the child care providers' language as well as the children's language levels pre-, post- and 9-month follow up.

Preliminary findings did not show significant differences between the control and experimental groups. However, the experimental group had reduced the amount of read text during book reading at 9-month follow-up and had higher ratings on the "Wait" and "Listen" scale for the playdough activity. The language transcriptions revealed that, in a French minority language learning setting, the children increased their verbal output...more so in English. Other outcomes will be discussed and several angles will be proposed for future research with this training model, from the in-service facilitators background to the frequent turnover and its impact on the preschool children's social and communication skills in early child care settings.

References

Duguay, R.M., [2008]. La petite enfance en milieu minoritaire francophone, Université de Moncton. <https://lc.cx/ixCD>

Girolametto, L., Weitzman, E., & Greenberg, J. (2003). Training day care staff to facilitate children's language, *American Journal of Speech-Language Pathology*, vol. 12, no. 3, 299-311.

Greer, Kristine (2011). Tackling Turnover: One Center's Efforts to Institute Center- and Community-Wide Change in Exchange, no199, 24-27.

17 The Acquisition of Morphotactics: An Experimental Study with Lithuanian TD and SLI Children

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Morphotactics is a new research field, which has been established over the last years (Dressler, Dziubalska-Kotaczyk 2006a, 2006b) and concerns the co-occurrence of sounds at morpheme boundaries. Although studies exploring the acquisition of morphotactics are still rare, they show that morphological information plays a significant role in the acquisition of morphotactic clusters. Being a strongly inflected fusional language with a very rich inflectional and derivational morphology, Lithuanian represents an especially interesting case for the study of the acquisition of morphotactics.

The aim of the present study is to test the Strong Morphotactic Hypothesis (SMH), according to

which morphotactic clusters are better retained during production than phonotactic clusters due to the function fulfilled by a morpheme. The study is based on experimental data collected from 100 Lithuanian TD children (3-4, 4-5, 5-6, 6-7 years old; 25 subjects per each age group) and 15 Lithuanian children with specific language impairment (SLI) (6-7 years old). The procedure of the test included 3 tasks: non-word repetition task, sentence repetition task, and production task.

This study explores the impact of morphology on the acquisition of phonotactics. The findings of experimental tests suggest that TD children process morphotactic clusters more accurately than phonotactic clusters because morphotactic clusters have the function of co-signalling the existence of a morphological rule. In contrast to TD children, for SLI children prototypical morphotactic clusters are the most difficult as SLI children are not sensitive to morphological information which is carried by morphotactic clusters. As the results of repetition and production tasks indicate, 6-7 years old SLI children match TDs who are 3-4 years old. These findings supplement the statement of Marshall and van der Lely (2006) that SLI children perform better on monomorphemically legal clusters than on monomorphemically illegal clusters.

References

Dressler, Wolfgang U.; Dziubalska-Kotaczyk, Katarzyna 2006a. Proposing morphotactics. – *Rivista di Linguistica*, 18(2), 249-266.

Dressler, Wolfgang U.; Dziubalska-Kotaczyk, Katarzyna 2006b. Proposing morphotactics. – *Wiener Linguistische Gazette*, 73, 1-19.

Marshall, Chloe R.; van der Lely, Heather K. J. 2006. A challenge to current models of past tense inflection: the impact of phonotactics. – *Cognition*, 100, 302-320.

18 Is child speech intelligible? The case of cochlear implanted (CI) vs normal-hearing (NH) children.

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Cochlear implants (CI) allow pre-, peri- and post-lingually deaf adults and children to access sounds of their environment, including speech sounds. However, this audio input remains degraded when

compared to typical auditory information, due to technological limitations in sound processing, which then entails difficulties producing intelligible speech. Past studies of intelligibility in CI children have mainly been conducted in English-speaking communities and often focus on the short-term gain in intelligibility following cochlear implantation. Less attention is given to longer-term effect of cochlear implantation on children's intelligibility and to date, only two studies of the intelligibility of CI children have been conducted in French, both using judgments by speech therapists: Perrin et al. (1999) used read speech by 4 CI and 4 NH 9-to-14-yr-old children and Calmels et al. (2003) used spontaneous productions of 63 1-to-10-yr-old CI children recorded in a longitudinal study from 3 months to 5 years post-implantation. In these studies, intelligibility is understood as the perceived accuracy of the children's production. The first study linked the intelligibility level to supra-segmental characteristics of speech (voice quality, speech rate and pauses) whereas the second proposed a correlation between intelligibility and perceptual abilities of the CI children.

Contrary to the previous studies with French-speaking children, we consider intelligibility as the level of understanding a listener can have of the children's productions, but not as a judgment of production accuracy. We recorded spontaneous speech productions using a narrative task in which 13 CI and 13 NH 5-to-11-yr-old age-matched children had to watch a cartoon before describing it to the examiner. Nine speech therapists and 17 naive listeners were then asked to listen to five utterances produced by each child and rate them on a 1-to-7 point scale. We aimed at understanding the influence of 1) listeners' expertise, 2) hearing level and 3) characteristics of CI-use on intelligibility.

Results show that 1) naive and expert judgments do not differ significantly, 2) CI children are significantly less intelligible than their NH peers, 3) intelligibility increases with chronological age in the CI group, but not in the NH group, 4) duration of implant use is correlated with intelligibility, and 5) earlier implantation (before 20 months) helps with intelligibility. Furthermore, the levels of intelligibility will be correlated with segmental characteristics of the children's production, in order to provide specific guidelines for speech therapy.

References

- Calmels, M.-N., Saliba, I., Wanna, G., Cochard, N., Fillaux, J., Deguine, O. & Fraysse, B. (2004), Speech perception and speech intelligibility in children after cochlear implantation, *International journal of pediatric otorhinolaryngology*, 68, 347-351
- Perrin, E., Berger-Vachon, C., Topouzkhian, A., Truy, E. & Morgon, A. (1999), Evaluation of cochlear implanted children's voices, *International journal of pediatric otorhinolaryngology*, 47, 181-186

19 The frequency and distribution of delay markers in acquisition

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Adult speakers use delay markers (uh, um) to hold the floor when anticipating production delay (Clark and Fox Tree, 2002). But how and when do young children learn to use them? Previous work shows that children produce delay markers (DM) with increasing frequency from age 2;0 (Casillas 2014), but often conflates two uses of DMs: turn-timing while processing an interlocutor's utterance, and floor-holding while planning their own (e.g., Kidd et al. 2007). I argue that each have a distinct developmental trajectory, and are associated with different turn-positions: turn-initial DMs result from turn-timing demands and should decrease as conversational skills develop, while turn-medial DMs result from planning demands, and should increase as children plan and produce more complex utterances.

Examining the corpus of an English-speaking male aged 2;2.16 to 3;2.02, I coded every child-produced turn for turn-type and every DM for turn-position. Overall, the position of a DM within a turn was significantly associated with turn-type: turn-initial DMs were used in response to questions, and turn-medial DMs in child-initiated turns ($p < 0.001$). Turn-initial DMs were significantly more often produced in response to questions – indicating their use as DMs to mitigate the effects of turn-timing delays – but turn-medial DMs across all turn-types were the driving force for increased DM production over time ($p < 0.001$).

Is the increase in intra-turn floor holding associated with increased linguistic skills overall? In a second corpus study, I examined DM production and linguistic complexity in the speech of five children aged between 1;4 and 3;4. Complexity was quantified by four measures, including vocabulary diversity and grammatical complexity. Initial results do not show a significant relationship between increased DM production and linguistic sophistication, suggesting that the observed increase in DM usage may be driven by pragmatic and social factors, rather than purely lexicosyntactic ones. Future investigation of DMs may thereby reveal much about the acquisition of sociopragmatic competence.

References

- Casillas, M. (2014). Taking the floor on time: Delay and deferral in children's turn taking. In Arnon, I., Casillas, M., Kurumada, C., and Estigarribia, B. (Eds.). (2014). *Language in interaction: Studies in honor of Eve V. Clark*. Amsterdam/Philadelphia: John Benjamins.

Clark, H. H. & Fox Tree, J. (2002). Using uh and um in spontaneous speaking. *Cognition*, 84, 73–111.

Kidd, C., White, K. S., & Aslin, R. N. (2009). Children's use of disfluencies for pragmatic inference in lexical development. *Proceedings of the Annual Meeting of the Cognitive Science Society*, 31, 1494–1499.

20 Preposition use in 4 to 6 year old children with SLI compared to typically developing children

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Introduction

Prepositions are important function words in everyday communication and serve a number of semantic and syntactic functions. Children with specific language impairment (SLI) are expected to have problems with prepositions as they are known to have considerable difficulty in acquiring function morphemes (Leonard, 1989). Surprisingly preposition use in SLI has received relatively little attention and it is unclear if the acquisition of prepositions is not only delayed but also deviant (Watkins and Rice, 1991; Grela et al., 2004).

The purpose of the present study was to investigate differences and similarities in preposition use in children with SLI and typically developing children.

Methods

We collected spontaneous language samples during play of children with SLI (n=10, age 4-6 years), age-matched children with typical language development (n=7) and a group of younger children matched on mean length of utterance (n=8, age 2-3 years). 50 Utterances in each sample were coded for frequency and type of prepositions and for errors in preposition use. A comparison between the 3 groups was made.

Results

Children with SLI used fewer prepositions in com-

parison with their age-matched peers but performed comparable to the younger language-matched group.

In all groups only a small number of omissions and substitutions was seen. However children with SLI made many mistakes in a grammatical construction that is characteristic for the Dutch language. In Dutch pronouns and prepositions can be combined, resulting in constructions such as 'thereby'. Children with SLI used this construction more frequently than language-matched children, often omitting the pronoun-part.

Conclusion

Acquisition of prepositions in children with SLI is delayed and for the most part comparable to younger children with the same language age. The difficulty children with SLI show in the pronoun-preposition construction in Dutch reveals underlying grammatical weakness.

References

Grela, B.G., Rashiti, L. & Soares, M. (2004). Dative prepositions in children with specific language impairment. *Applied Psycholinguistics*, 25, 467 – 480.

Leonard, L.B. (1989). Language learnability and specific language impairment in children.

Applied Psycholinguistics, 10, 179–202.

Watkins, R.V. & Rice, M.L. (1991). Verb particle and preposition acquisition in language-impaired preschoolers. *Journal of Speech, Language and Hearing Research*, 34(5):1130–41.

21 Production of prosodic prominence in the utterances of Cochlear Implanted (CI) and normally hearing (NH) infants: a perceptual study

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Children produce traces of adultlike prosodic prominence from early on in development [1,2,3]. A previous acoustic study on prominence production in the present dataset has shown that infants with CI differentiate less between syllables in terms of fundamental frequency and intensity, even from babbling onwards [4]. The current study investigates

if this acoustic difference between the prominence production of infants with CI and NH infants is also perceivable by listeners.

The stimuli used in this study were disyllabic utterances produced by Dutch-acquiring infants with CI (n=9) and NH infants (n=9). The babbles (n=527) and words (n=1089) were presented one by one to naive adult judges (n=30) in two perceptual experiments, one for every utterance type. The raters had to indicate the prosodic differentiation between the two syllables by moving a slider on a visual analogue scale. Afterwards, the results were entered in Multi Level Models.

The results showed that the babbles of the CI infants were more likely to be rated at the midpoint of the axis, whereas the NH babbles were more likely to be rated at the extremes, indicating less prosodic differentiation in CI babble. Similarly, the words of CI infants were more likely to be rated at the midpoint of the axis. In babble there was no significant bias towards the ambient trochaic pattern in the ratings of both groups, whereas in words there was a trochaic bias, although this did not reach significance for the CI infants.

It is concluded that there is a perceivable discrepancy between the prominence production of CI and NH infants, even from babbling onwards. Moreover, the ambient trochaic pattern is only perceivable in words and not in babble, and this to a smaller extent for the CI infants. These perceptual results confirm previous acoustic findings [4].

References

Davis, B., MacNeilage, P., Matyear, C., & Powell, J. (2000). Prosodic correlates of stress in babbling: An acoustical study. *Child Development*, 71, 1258-1270.

DePaolis, R., Vihman, M., & Kunnari, S. (2008). Prosody in production at the onset of word use: A cross-linguistic study. *Journal of Phonetics*, 36, 406-422.

De Clerck, I., Pettinato, M., Verhoeven, J., & Gillis, S. (2016). Is prosodic production driven by lexical development? Longitudinal evidence from babble and words. *Journal of Child Language*, 1-26.

Pettinato, M., De Clerck, I., Verhoeven, J., & Gillis, S. (2017). Expansion of Prosodic Abilities at the Transition From Babble to Words: A Comparison Between Children With Cochlear Implants and Normally Hearing Children. *Ear & Hearing*.

22 Narrative production of children acquiring Lithuanian as a heritage language

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Global travel and work create situations when children grow up in bilingual environments where a heritage language is spoken at home and a majority language is used at school. Research on second language learners has predominantly focused on children's acquisition of the majority language, and only few studies have examined the heritage language development of such children. Most of research on heritage speakers has so far investigated the situation of adults, whereas little attention has been given to children acquiring the heritage language, especially how their language might be diverging from monolinguals at different stages of development (Montrul, 2010).

The study examines macro- and microstructural characteristics of narrative production of children in the UK (n = 12) who speak Lithuanian as a heritage language (mean age 6;1) in comparison to monolingual control peers (n = 12) in Lithuania. The LITMUS-MAIN methodology (Gagarina et al., 2012, 2015) was employed for narrative elicitation. During the individual sessions, the children were asked to tell a story based on the picture sequence; each session was audio recorded. The examined macrostructural characteristics include story structure, episode completeness, and internal state terms. The microstructural characteristics were evaluated measuring productivity, lexical diversity, syntactic complexity, and cohesion.

The results show that the monolinguals have demonstrated greater ($p < 0.05$) lexical diversity and used a wider range ($p < 0.05$) of syntactic devices to create story cohesion than the heritage speakers, although a general story length (words, utterances, communication units) was higher ($p < 0.05$) in the heritage group. The results point to specific aspects of language that may be difficult for children to acquire without formal education in Lithuanian. We assume that better performance in story length by heritage speakers might be attributed to a greater emphasis on oral narrative production within the educational system of the UK.

References

Gagarina N., Klop D., Kunnari S., Tantele K., Välimaa T., Balčiūnienė I., Bohnacker U. & Walters J. (2012). MAIN: Multilingual Assessment Instrument for Narratives. ZASPil Nr. 56 – December 2012. Berlin: ZAS.

Gagarina N., Klop D., Kunnari S., Tantele K., Välimaa T., Balčiūnienė I., Bohnacker U. & Walters J. (2015). Assessment of narrative abilities in bilin-

qual children. In Sh. Armon-Lotem, J. de Jong & N. Meir (Eds.), *Assessing Multilingual Children: Disentangling Bilingualism from Language Impairment* (243-276). *Multilingual Matters*.

Montrul, S. (2010). Current issues in heritage language acquisition. *Annual Review of Applied Linguistics* 30, 3-23.

23 The long-term development of speech production in children with CI in comparison to normally hearing peers: accuracy and variability at the word level

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We examine the speech production accuracy and variability at the word level of children with cochlear implants (CI). Whereas previous literature mainly focused on one particular age, the present study explores the long-term development in the spontaneous speech productions of Dutch-speaking children with CI. The development of whole-word accuracy and that of intraword variability is traced between word onset and five years of age, and compared to that of normally hearing (NH) peers. Regarding accuracy little is known about the developmental trajectory in Dutch-speaking children with CI thus far. Only the longitudinal development up to two-and-a-half years of age is studied for Dutch [1]. For English, a few long-term studies are available, but do not include spontaneous speech (e.g. [2]). With respect to intraword variability, the longitudinal development of children with CI has not been studied yet. We examine the spontaneous speech productions of 9 children with CI, followed between word onset and five years of age. In addition, a comparison with a cross-sectional age-matched control group of NH children between ages two and five is performed. Whole-word accuracy is measured using Levenshtein distance; intraword variability is calculated by means of Proportion of Whole-word Variation [3]. The effects of the target word's syllable length and the target word's frequency are considered. Results show a decrease of intraword variability and an increase of whole-word accuracy with age in children with CI. Target words with more syllables and less frequent target words are more variable and less accurate. Children with CI are more variable and less accurate than NH children up to age four, but catch up by age five. The effect of the target word's syllable length is more pronounced in children with CI, and the inverse is

true for the effect of whole-word frequency. Clinical implications will be discussed.

References

Schauwers, K., Taelman, H., Gillis, S., & Govaerts, P. (2008). Phonological proficiency and accuracy of young hearing-impaired children with a cochlear implant. In S. Kern, F. Gayraud & E. Marsico (Eds.), *Emergence of linguistic abilities* (pp. 156 - 171). Newcastle: Cambridge Scholars Publishing.

Ertmer, D., & Goffman, L. (2011). Speech production accuracy and variability in young cochlear implant recipients: comparisons with typically developing age-peers. *Journal of Speech, Language, and Hearing Research*, 54, 177 - 189.

Ingram, D. (2002). The measurement of whole-word productions. *Journal of Child Language*, 29, 713-733.

24 Children's Detection of Iconic Telicity in Sign Language

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Wilbur (2008) proposed that many sign languages contain telicity markers that are iconic (i.e. "visible") and physically instantiate a core semantic element of telicity: telic signs, which encode bounded event meaning, involve a salient boundary in production (through hand shape, orientation, or placement) while atelic signs, which encode unbounded actions, lack such salient boundaries in their signs while often containing homogenous motion characteristics (e.g. repetition). Strickland et al. (2015) provided experimental evidence that a grasp of such mappings does not depend on prior exposure to sign languages: hearing non-signers could successfully "see" telicity and consistently attributed meanings to unknown signs that were consistent with that sign's telicity.

We report on a pair of studies that asked hearing non-signing 5-year-old children (N = 48) to view signs from The Sign Languages of the Netherlands (NGT) and Italian Sign Language (ILSs that referred to telic or atelic verb meanings. Children provided their own translations for each sign and these were coded for how accurately they encoded the meaning of the specific verb (as rated by naive adults) and whether they matched the sign's telicity value (as assessed by two expert coders blind to the

actual sign being translated). Children's ability to accurately translate the meaning in the signs was interpreted as evidence that those meanings were indeed visible in the signs.

The results found that overall, the atelic verbs contained more superficially iconic information than the telic ones. However, above and beyond this, there was a significant additional effect of telicity, with children being more likely to provide translations that matched the telicity of the sign even when they got the actual meaning of sign incorrect. These results show that 5-year-olds can detect the telicity of sign language verbs and support the idea that telicity has iconic correlates in at least two sign languages.

References

Strickland, B., Geraci, C., Chemla, E., Schlenker, P., Kelepir, M., & Pfau, R. (2015). Event representations constrain the structure of language: Sign language a window into universally accessible linguistic biases. *PNAS* 12, 5968 – 5973.

Wilbur R.B. (2008). Complex predicates involving events, time, and aspect: Is this why sign languages look so similar? *Theoretical Issues in Sign Language Research*, 217–250.

25 Input from Hearing and Deaf families for the Acquisition of Simultaneous Constructions in French Sign Language

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Research has shown that the acquisition of simultaneous constructions in sign languages is not fully mastered until age 8-9 (Tang et al 2007). This late development can be accounted for by the complexity of the structures on both the articulatory level (mastering simultaneous manual and non-manual parameters) and the cognitive level (handling different perspectives of the same event, decentering). Slobin et al. (2003) indicate that their five-year-old subjects had difficulties changing perspectives throughout their narrative (alternating narrator/external perspective and protagonist/internal perspective). In contrast, their twelve-year-old subjects have a better mastery of non-manual parameters (body posture, facial expression, gaze) enabling them to alternate internal and external perspectives, and even to rapidly change internal perspectives from one protagonist to another.

Only few studies addressed these questions in LSF (French Sign Language). Thereby we selected parts of the Creagest Corpus (Sallandre & L'Huillier 2011) and we annotated data with ELAN software. Specifically, we analyzed a narrative production of Deaf signers who all have LSF as a first language (n=18, six children from hearing families, six from Deaf families, two children per group aged 5, 8 and 10 respectively, and six adults). As 95% of Deaf children come from hearing families, we examine the late input's impact in this population.

Our initial results seem to confirm previous studies. However, contrary to what is noted in the literature, at 5 years old, children from Deaf families can produce complex structures called double transfers, which allow them to express both perspectives simultaneously. In comparison, our subjects from hearing families can't master these linguistic structures at the same age. But later, at 8 and 10 years old, we don't observe significant differences between both groups (from hearing or Deaf families) as they both master simultaneous constructions. Then we suggest that an early input in LSF could influence the type of structures produced, when children are young (until age 5-6), but when children grow, they can overtake their late acquisition of LSF.

References

Cormier, K., Smith, S. & Sevcikova, Z. (2013). "Predicate structures, gesture and simultaneity in the representation of action in British Sign Language: Evidence from deaf children and adults". *Journal of Deaf Studies and Deaf Education* 18, 370-90.

Karadöller, D.Z., Sümer, B. & Özyürek, A. (2017). Effects of Delayed Language Exposure on Spatial Language Acquisition by Signing Children and Adults. *Proceedings of the Cognitive Science Conference*, May 2017.

Sallandre, M.-A. & L'Huillier, M.-Th. (2011). Corpus vidéo de LSF enfantine. *Projet ANR Creagest* (Universités Paris 8, Paris 5 et Lille 3, dir. B. Garcia). <https://www.ortolang.fr/market/corpora/ortolang-000916>

Slobin, D.I., Hoiting, N., Kuntze, K., Lindert, R., Weinberg, A., Pyers, J., Anthony, M., Biederman, Y. & Thumann, H. (2003). "A cognitive/functional perspective on the acquisition of "classifiers". In K. Emmorey (Ed.), *Perspectives on classifier construction in sign languages*, 271–296. Mahwah, NJ : Lawrence Erlbaum Associates.

Tang, G., Sze, F. & Lam, S. (2007). "Acquisition of simultaneous constructions by deaf children of Hong Kong Sign Language". In M. Vermeerbergen, L. Leeson & O. Crasborn (Eds.), *Simultaneity in Signed Languages: Form and Function*, 283–316. Amsterdam/Philadelphia : John Benjamins.

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The identifiability of the speech of children with cochlear implants in comparison to normally hearing children and children with an acoustical hearing aid

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Even after several years of device use, the speech of children with a hearing impairment (HI), cochlear-implanted (CI) as well as children with an acoustical hearing aid (HA), differs from the speech of their normally hearing peers (NH). Differences between the speech of NH, CI and HA children were revealed in the fine acoustics of their speech [1,2]. Here our question is whether those details that we can measure are also detectable by the human ear and lead to the identifiability of these children. More specifically, the aim of the present study was to investigate (I) whether the speech of hearingimpaired children can reliably be distinguished from NH children's speech, and (II) whether listeners can accurately discriminate the speech of children with CI and children with HA.

For this purpose, a categorisation task was administered: 90 adults listened to short sentences and had to indicate whether the speaker was NH, CI or HA. The stimuli were produced by 21 Dutch speaking 7yearolds (7 CI, 7 HA and 7 NH). The adults had varying degrees of familiarity with the speech of hearingimpaired children: 30 audiologists, 30 primary school teachers, and 30 "naïve" listeners.

Results show that listeners accurately identify the speech of normally hearing children. In 78% of all cases, listeners classified NH stimuli correctly. Hearingimpaired children were also classified reliably as hearingimpaired. Thus, adults pick up the acoustic cues of hearingimpaired speech (precision = 0.85, recall = 0.64). However, substantial differences between HA and CI children were revealed. CI children were significantly more frequently labelled as NH, whereas HA children were more consistently labelled as HI. But, essentially, CI and HA children were not reliably distinguished, indicating that listeners did not have a clear idea on the specific characteristics of cochlearimplanted and hearingaided speech. Clinical implications will be discussed.

References

Verhoeven, J., Hide, Ø., De Maeyer, S., Gillis, S., & Gillis, S. (2016). Hearing impairment and vowel production. A comparison between normally hearing,

hearing-aided and cochlear implanted Dutch children. *Journal of Communication Disorders*, 59, 24-39.

Lenden, J. M., & Flipsen, P. (2007). Prosody and voice characteristics of children with cochlear implants. *Journal of Communication Disorders*, 40, 66-81.

27

Task effects on noun plural production in German-speaking preschoolers with cochlear implants

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Previous research on language development in children with CI has focussed mainly on standard tests (Caselli, Rinaldi, Varuzza, Giuliani, & Burdo, 2012; Duchesne, Sutton, & Bergeron, 2009; Svirsky, Teoh, & Neuburger, 2004). However, children's performance in a test may be very different from spontaneous speech. The aim of this study was to illuminate the role of task-dependent differences on language development in children with CI by studying a particular morphological phenomenon (noun plurals) using two different methodologies.

The study involved 7 children with CI (median age 4;5, range 3;10-5;3) and 20 age-matched normally hearing controls. The children with CI were diagnosed a profound hearing impairment (>90dBHL) in the first year of life, received bilateral implants before 24 months, and were raised in hearing, monolingual families. Children were administered two tasks: Task 1 was a picture-based plural elicitation task in which participants were presented a set of singular nouns for which they had to provide the plural forms; Task 2 was a semi-structured interview in which participants were asked to comment on pictures of familiar routines (e.g., a visit to the zoo) which constitute good triggers to elicit naturalistic speech about nouns and noun plurals. The two tasks were compared based on a subsample with similar word frequencies (mid-low plural token frequency).

Statistical mixed-effects-modeling showed that (i) children with CI produced significantly more singular nouns (instead of plurals) compared to their age-matched NH peers, but (ii) there was no difference in the correct use of plurals. In both child groups, children's performance was better in Task 2 than in Task 1; hence, there was no interaction between Hearing and Task. These results suggest that an elicitation task like Task 1 may underestimate

language production skills of children with CI, but may give a good indication of relative performance in comparison to NH children.

References

Caselli, M. C., Rinaldi, P., Varuzza, C., Giuliani, A., & Burdo, S. (2012). Cochlear Implant in the Second Year of Life: Lexical and Grammatical Outcomes. *Journal of Speech Language and Hearing Research*, 55(2), 382–394. [https://doi.org/10.1044/1092-4388\(2011/10-0248\)](https://doi.org/10.1044/1092-4388(2011/10-0248))

Duchesne, L., Sutton, A., & Bergeron, F. (2009). Language Achievement in Children Who Received Cochlear Implants Between 1 and 2 Years of Age: Group Trends and Individual Patterns. *Journal of Deaf Studies and Deaf Education*, 14(4), 465–485. <https://doi.org/10.1093/deafed/enp010>

Svirsky, M. A., Teoh, S.-W., & Neuburger, H. (2004). Development of Language and Speech Perception in Congenitally, Profoundly Deaf Children as a Function of Age at Cochlear Implantation. *Audiology and Neuro-Otology*, 9(4), 224–233. <https://doi.org/10.1159/000078392>

28 Supporting semantic learning through iconic gesture in children with specific language impairment

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Iconic gestures illustrate properties of the referent. They have been shown to improve lexical learning in children (e.g. Capone & McGregor, 2005; Lüke & Ritterfeld, 2014; Vogt & Kauschke, 2017). In this study, semantic learning was investigated under two co-speech gesture conditions in children with specific language impairment (SLI) and typically developing children (TD). New words were presented either with iconic gestures or with attention-focusing control gestures. Learning was analyzed between conditions.

A training study (3 sessions) was conducted teaching rare nouns and verbs to 20 children with SLI (age 4), 20 TD children matched for age (AM) and 20 TD children matched for language scores (LM, age 3). Children heard the target words while seeing iconic gestures or gestures focusing children's attention on the heard words. After training completion, children answered probe questions on the words' meaning. This served as a measure of semantic learning. Responses were coded for the amount of information provided on each word.

A mixed-design ANOVA revealed that the LM children gave significantly fewer information on the target words than the AM group and the SLI group. The effect of gesture condition tended to vary across groups such that scores of words trained with iconic gestures were significantly higher than scores of words trained with attention-directing control gestures in the SLI group, but not in the TD groups. Providing information on target nouns and verbs did not differ.

Results suggest that semantic learning was more influenced by gesture condition in children with SLI than it was in TD children. Children with SLI exploited the characteristic capacity of iconic gestures to capture properties of a referent for learning and thereby established a deeper understanding of the words' meaning.

References

Capone, N. C., & McGregor, K. K. (2005). The effect of semantic representation on toddler's word retrieval. *Journal of Speech, Language and Hearing Research*, 48(6), 1468–1480.

Lüke, C., & Ritterfeld, U. (2014). The influence of iconic and arbitrary gestures on novel word learning in children with and without SLI. *Gesture*, 14(2), 204–225.

Vogt, S., & Kauschke, C. (2017). Observing iconic gestures enhances word learning in typically developing children and children with specific language impairment. *Journal of Child Language*, doi: 10.1017/S0305000916000647

29 Targeted Exposure to Adult Verb Forms in the Early Acquisition of Hebrew

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The role of Child Directed Speech in exposing children to the target forms in their ambient language has been studied extensively from various perspectives (Cameron-Faulkner, Lieven & Tomasello, 2003; Freudenthal, Pine & Gobet, 2002; Küntay & Slobin, 2002). Our focus here is on adult reformulations of children's verb productions (Clark & de Marneffe, 2012), aiming to address the question of whether such reformulations change over time, as children's grammatical knowledge advances.

We analyzed weekly recorded longitudinal samples from four Hebrew-acquiring children (age-range: 1;4–2;5; total child verb forms: 8,337). Each child's verb production was coded for its inflectional cat-

egory and for whether it was reformulated by the adult. 'Reformulations' here refers to repetitions of the verb lexeme produced by the child in the immediate adult response, in the form of either clarification or elaboration on the topic. Children's productions of truncated verb forms that could not be assigned an inflectional target (e.g., the production tapes can correspond to letapes 'to-climb', metapes 'is-climbing', or yetapes 'will-climb'), were coded as inflectionally opaque (Lustigman, 2013, 2016). Our hypothesis was that as children use more verb inflections and fewer inflectionally opaque forms, adult reformulation rates decrease.

Our findings show that: (a) children's early verbs are typically opaque with inflections added gradually to their repertoire; (b) most of early verb productions (70%-100%) are followed by reformulations by the adult interlocutor; and (c) as the level of opacity in children's verbs decreases, adult responses include fewer reformulations. These findings show that adult reformulations provide children with extensive feedback on their verb uses. Not only do adults reformulate children's verb forms in high rates, they are also attuned to the children's level of grammatical knowledge and respond to their verb productions accordingly. This provides further evidence for the richness of the input children are exposed to, and hence for the critical role of interaction in language acquisition.

References

- Cameron-Faulkner, T., Lieven, E. & Tomasello, M. (2003). A construction based analysis of child directed speech. *Cognitive Science*, 27, 843-873.
- Clark, E. V. & de Marneffe, M-C. (2012). Constructing verb paradigms in French: Adult construals and emerging grammatical contrasts. *Morphology* 22:89-120.
- Freudenthal, D., Pine, J., & Gobet, F. (2002). Modeling the development of Dutch Optional Infinitives in MOSAIC. In W. D. Gray & C. D. Schunn (Eds.), *Proceedings of the 24th Annual Meeting of the Cognitive Science Society*. (pp. 328-333). Mahwah, NJ: Erlbaum.
- Küntay, A. & Slobin, D. I. (2002). Putting interaction back into child language: Examples from Turkish. *Psychology of Language and Communication*, 6, 5-14.
- Lustigman, L. (2013). Developing structural specification: Productivity in early Hebrew verb usage. *First Language*, 33, 47-67.
- Lustigman, L. (2016). From opacity to transparency: Transitional categories in early Hebrew grammar. In Ruth A. Berman (ed.), *Acquisition and development of Hebrew: From infancy to adolescence (Trends in Language Acquisition Research [TILAR])*. (pp. 225-258). John Benjamins Publishing Company.

30 Parent-infant Socio-cognitive Communication in Symbolic Play

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Developmental psychologists have long recognised theoretical and empirical commonalities between symbolic play and language development. Symbolic play provides infants and parents with opportunities to navigate and rehearse symbolic relationships through the use of tools (e.g., objects) and signs (e.g., language, gesture), which rely on the support of the social context (Rakoczy et al., 2004). This study aimed to explore differences in socio-cognitive communication in parent-infant interaction during symbolic play compared to non-symbolic play. Fifty-four parents and their 18-month-old infants were observed engaging in 20 minutes of play (10 minutes symbolic, 10 minutes non-symbolic) in their own home. Play interactions were coded and compared across play conditions for the frequency and duration of joint attention episodes, the presence of gestures such as points (declarative, imperative) and iconic gestures (in-hand, out-of-hand) and whether or not gestures were accompanied by speech. The results suggested that symbolic play constitutes a particularly fertile environment for communicative exchange. Joint attention was established more frequently and episodes were longer in duration during symbolic play than in non-symbolic play, suggesting that symbolic play may foster infants' burgeoning ability to represent others' minds in interaction, a suggestion that is consistent with socio-cultural approaches to development (e.g., Tomasello et al., 2005) and past empirical work (e.g., Charman et al., 2000). Parents and infants gestured more frequently during joint attention episodes that occurred within symbolic play than joint attention episodes that occurred within non-symbolic play, and the majority of these gestures were iconic gestures. It is concluded that the socio-cognitive ecology of symbolic play has a positive effect on language development via its tendency to engage interlocutors in the shared exchange and negotiation of meaning.

References

- Charman, T., Baron-Cohen, S., Swettenham, J., Baird, G., Cox, A., & Drew, A. (2000). Testing joint attention, imitation, and play as infancy precursors to language and theory of mind. *Cognitive Development*, 15(4), 481-498. doi:10.1016/S0885-2014(01)00037-5
- Rakoczy, H., Tomasello, M., & Striano, T. (2004). Young children know that trying is not pretending: A

test of the “behaving-as-if” construal of children’s early concept of pretense. *Developmental Psychology*, 40(3), 388–399. doi:10.1037/0012-1649.40.3.388

Tomasello, M., Carpenter, M., Call, J., Behne, T., & Moll, H. (2005). Understanding and sharing intentions: The origins of cultural cognition. *Behavioral and Brain Sciences*, 28(5), 675–691. doi:10.1017/S0140525X05000129

31 Prominence in speech and gesture help preschoolers to recall and comprehend information

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Though the positive effects of iconic (or representational) gestures on word recall and comprehension by children have been clearly established, less is known about the benefits of beat gestures (rhythmic hand/arm movements produced in alignment with prominent prosody). The increase in word recall has been highlighted as one of the positive effects in the use of representational gestures (e.g., So et al., 2012). With respect to beat gestures, results remain controversial. Research has shown that naturally produced beat gestures (accompanied by prosodic prominence) favour word recall in a contrastive discourse by adults (Kushch & Prieto, 2016). According to So et al. (2012), beats increase word recall by adults but not by children. Nevertheless, another study by Igualada et al. (2017) found that beats help preschoolers to recall words. In these two studies, children had to remember target words from a list of items. Yet, we do not know whether preschoolers can benefit from the use of beat gestures as pragmatic encoders of contrastive information in natural discourse. Concerning comprehension, empirical studies have revealed that representational and deictic gestures guide children towards the semantic content of a message, i.e. they help children to better comprehend the discourse they are listening to. Even though Wang & Chu (2013) presented neurophysiological evidence that beat gestures enhance semantic process during the comprehension of speech in adults, to our knowledge, the behavioral effects of beat gestures on language comprehension in preschoolers have not yet been investigated.

The current study investigated (a) whether beat gestures combined with prosodic information help

children recall information in a child-directed discourse (Experiment 1) and (b) whether the presence of beat gestures helps children understand the content of a narrative (Experiment 2). In Experiment 1, fifty-one 4-year-old children were exposed to a total of three short stories with contrastive words presented in three conditions, namely non-prominent speech, prominence only in speech and prominence in both speech and gesture. Results of a recall task showed that children remembered more words when they were presented with prosodic prominence and beat gestures compared to either of the other two conditions. In Experiment 2, fifty-five 5- and 6-year-old children were presented with six narratives either in the no-beat or the beat condition. Results of a comprehension task demonstrated that stories told with beat gestures were comprehended better by children. Together, these results constitute evidence that beat gestures help preschoolers not only recall but also comprehend discourse information.

References

Igualada, A., Esteve-Gibert, N., & Prieto, P. (2017). Beat gestures improve word recall in 3- to 5-year-old children. *Journal of Experimental Child Psychology*, 156, 99–112.

Kushch, O., & Prieto, P. (2016). The effects of pitch accentuation and beat gestures on information recall in contrastive discourse. *Proceedings of Speech Prosody 2016*. Boston, USA, May 31–June 3, 2016.

So, W. C., Sim Chen-Hui, C., & Low Wei-Shan, J. (2012). Mnemonic effect of iconic gesture and beat gesture in adults and children: Is meaning in gesture important for memory recall? *Language and Cognitive Processes*, 27(February 2014), 665–681.

Wang, L., & Chu, M. (2013). The role of beat gesture and pitch accent in semantic processing: An ERP study. *Neuropsychologia*, 51(13).

32 Audiovisual correlates of focus production in French-speaking 4 and 5 year olds

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We examine audiovisual correlates of contrastive focus production in 4- and 5-year-old children us-

ing declarative sentences such as 'Take the ORANGE dress [not the blue dress]'. Previous research shows that 4-year-old children use phrasing to highlight elements in the discourse (Romoren & Chen, 2015), and that they use the adult-like pitch configuration at the adult-like position to mark contrastive focus only at 8-10 years of age (Ito, 2014). We hypothesize that young children first convey contrastive focus through body gestures and phrasing, before they master the complete set of adult-like pitch patterns to do so.

French-speaking 4 and 5 year olds (20 per age group) participated in a game that elicited semi-spontaneous production of declarative sentences. We tested 3 focus conditions (no-focus; contrastive focus; corrective focus) and 2 target focus positions (on the noun; on the adjective). They were audio-visually recorded and their linguistic and hearing abilities were also assessed. We analyzed prosodic cues (pitch contour; pitch range; word, syllable, and vowel duration; pauses) and gestural strategies (presence of body gestures; gesture type; gesture-speech alignment). Preliminary findings reveal that our French 4-year-old children did not use adult-like prosodic cues to mark focus (initial rise, duration, de-accentuation; Jun & Fougeron, 2000); instead, they seemed to use gestures and pauses to highlight elements, especially in the corrective focus condition. We expect that 5-year-old children will use gesture cues more systematically and will be better at using prosodic cues.

Our results suggest that young children can focus elements in the discourse, an ability that can be observed if information highlighting is seen as a multimodal phenomenon. Our study will help understanding how prosody and gesture are integrated in development. Future research should examine whether our results are limited to French (which has specific phonological constraints and uses syntax to mark contrastive focus), or if it is a cross-linguistic phenomenon.

References

- Romoren, A.S.H. & Chen, A. (2015). Quiet is the New Loud: Pausing and Focus in Child and Adult Dutch. *Language and Speech*, 58, 8-23.
- Ito, K. (2014). Children's pragmatic use of prosodic prominence. In D. Matthews (Ed.), *Pragmatic Development in First Language Acquisition* (pp.199-218). John Benjamins.
- Jun, S.A. & Fougeron, C. (2000). A Phonological Model of French Intonation. In A. Botinis (Ed.), *Intonation: Analysis, Modeling and Technology* (pp. 209-242). Dordrecht: Kluwer Academic Publishers.

33 From chunk to segment: U-shaped patterns in the facilitative effect of frames on children's word production

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While words are often treated as the basic building blocks of language, there is growing evidence for the role of multiword units in language: children and adults are sensitive to multiword information in learning and processing [1]. For instance children are better at producing irregular plurals (e.g., mice, teeth) after frames they often occur with (e.g., Brush your -- teeth, 2). Here, we use this effect to test the usage-based prediction that children draw on multi-word chunks in the learning process [3]. If children's reliance on larger chunks decreases with age, then the effect of frequent frames may be larger early on, then temporarily decrease as children focus on segmentation, until they build up adult like knowledge of the predictive relations between words and phrases. We investigate the developmental relation between phrases and words by looking at the effect of frequent frames (e.g. Brush your -- teeth) on the production of irregular plurals across two years (3;0-5;0, N=68). If children's knowledge is context-sensitive, production should be facilitated following such phrases. If the relation changes with age, we should see a change in the degree to which frequent-frames facilitate production.

We compared irregular plurals elicited with a labeling-question (What are all these?) versus a frequent frame (e.g., Three blind --) in a between-subject design. For each of the target nouns we selected the most frequent two-word frame preceding the noun (based on CHILDES). In both conditions children saw the same pictures and produced only the irregular noun. We use mixed-effect models to investigate the effect of age on performance. The results reveal that age had a u-shaped effect on performance : accuracy was facilitated by the frame in the younger and older children, but not the intermediate ones, a pattern consistent with a move from chunks to segments. The findings highlight the importance of multi-word information in learning and the need to take context properties into account when assessing children's abilities.

References

- Bannard, C., & Matthews, D. (2008). Stored word sequences in language learning: The effect of familiarity on children's repetition of four-word combinations. *Psychological Science*, 19, 241-248.

Anon, I. & Clark, E. V. (2011). When 'on your feet' is better than 'feet': Children's word production is facilitated in familiar sentence-frames. *Language Learning and Development*, 7, 107-129

Abbot-Smith, K. & Tomasello, M. (2006). Exemplar-learning and schematization in a usage based account of syntactic acquisition. *The Linguistic Review*, 23, 275-290.

34 Self-testing facilitates vocabulary growth in good and poor learners

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Problem: Self-testing is a useful learning method. Self-testing requires more effort and engagement than other study methods, and the act of retrieval during self-testing strengthens memory for newly learned information¹. Here, we asked whether self-testing is a useful word learning method and, if so, whether its benefit extends to poorer learners who may often answer incorrectly during self-testing.

Methods: Forty-seven university students with developmental language disorder (DLD) or normal language development (ND) attempted to learn three sets of novel word-picture pairs, nine pairs per set. Sets were randomly assigned to one of three training conditions. In the uncued test condition, the participant named the pictures and, after each, heard a chime when correct or the correct word when incorrect. In the cued test condition, the participant named each picture after being given the first syllable of the name as a cue. The chime or correct word followed. In the no test condition, the participant was presented with the pictured referent and its spoken name. Each condition repeated to result in four exposures per word-picture pair. To assess learning, the participant returned 24 hours later and named all pictures without cues or feedback.

Results: An ANOVA with diagnosis as the between-subjects factor and training condition as the within-subjects factor revealed a main effect for diagnosis, $F(1,45)=6.14$, $p=.02$, partial $\eta^2=.12$. The DLD group averaged 10% lower naming accuracy than the ND group. There was a main effect for condition, $F(2,90)=14.96$, $p<.001$, partial $\eta^2=.25$. For both diagnostic groups, performance was 10% better, on average, in the test conditions than the no test condition.

Conclusion: Self-testing methods are effective for vocabulary learning. Poorer language learners, here those with DLD, reap the same degree of benefit from self-testing as stronger language learners.

References

Roediger, H. L. III, & Karpicke, J.D. (2006). The power of testing memory: Basic research and implications for educational practice. *Perspectives on Psychological Science*, 1, 181-210.

ZONE 2

35 Predictive validity of the Kiswahili and Kigiriyama versions of the Communicative Development Inventories

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There is a dearth of measures of language development for the majority of languages, especially those spoken in low income countries. This is a problem both for theorists of language and researchers seeking to understand risk and protective factors for child development.

We developed Kiswahili and Kigiriyama versions of the Communicative Development Inventories (CDIs) for children aged 0;8 to 2;4 learning these Bantu languages spoken in coastal Kenya (Alcock et al., 2015). Such parent-completed language development checklists are especially helpful with children who are unused to formal testing or unfamiliar adults.

Measures of vocabulary, gestures, and grammatical constructions were developed from existing CDIs, interviews with parents, and spontaneous speech recordings. The CDIs were administered in interview format, as many parents are illiterate, to over 300 families.

Reliability and validity ranged from acceptable to excellent. Correlation with age was also significant. Validation against experimental or spontaneous speech measures was significant for some comparisons, generally those with higher variability in

the relevant age range (gesture for younger children and vocabulary/grammar for older children). This supports the use of CDIs when direct language testing is impractical.

The same cohort of children (N=177) was seen 5 years later aged 6-8. Measures of expressive vocabulary, verbal fluency and pragmatic language use were administered. CDI scores were modestly correlated to expressive vocabulary, $r(177) = .170$, $p = .019$. There was no significant correlation with category fluency or pragmatic language.

We were able to develop a valid and reliable CDI for these Bantu languages in a low income setting. It has excellent psychometric properties in infancy although its predictive validity was moderate in middle childhood. At this age both home and school influence children's language abilities more. Nevertheless, the measures are sensitive and valid, and useful for language researchers and those in applied fields.

References

Alcock, K. J., Rimba, K., Abubakar, A., Holding, P. A., Kitsao-Wekulo, P. K., & Newton, C. R. J. C. (2015). Developmental inventories using illiterate parents as informants: CDI construction in for two Kenyan languages. *Journal of Child Language*, 42(4), 763-785.

36 Vocabulary differences between monolingual and bilingual toddlers: a touch-screen study

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Key words: bilingualism, toddlers, touch-screen, vocabulary size

Research suggests that American bilingual children's vocabulary in their dominant language is smaller than that of monolinguals [1]. However, one recent study using a touch-screen test found that Canadian 2-year-olds' performance (accuracy and response time) did not differ as a function of bilingual status [3]. It is possible that this task better reflects the child's capabilities, as previous work with the same procedure has found it to be a better predictor of later vocabulary [2]. Alternatively, the difference does exist but is small enough

to sometimes yield false negatives. Since teasing these apart requires gathering additional data, we aimed to contribute an additional sample using a similar touch-screen test.

Children are tested with an iPad(R) in three different French daycares (monolingual $n = 17$; bilingual $n = 13$; M age = 2;8, range 1;11-3;4 - data collection still ongoing; an actualised version of our sample and analysis can be found here: <https://osf.io/u3qxp/>). There are 3 training trials followed by 41 test ones (including nouns, verbs and adjectives, with diverse frequencies of occurrence). In each, a pre-recorded voice provided a prompt that matched either the left or the right picture. A correct response resulted in an on-screen character providing positive feedback.

A Welch two sample t-test comparing percentage of correct answers found a monolingual advantage (monolingual, $M = 86.93$; bilingual $M = 73.86$; $t(18.95) = -1.99$, $p = .030$). These results are more in line with the view that bilinguals' lexical development in their L1 is different from monolinguals', running counter to the recent touch-screen study. It is possible, however, that many other factors (e.g., socio-economic status) are correlated with bilingualism more or less across different countries, which could explain the different findings across diverse studies. Further research taking these into account is needed to better understand which factors influence bilingual lexical language development.

References

Bialystok, E., Luk, G., Peets, K. F., & Yang, S. (2010). Receptive vocabulary differences in monolingual and bilingual children. *Bilingualism: Language and Cognition*, 13(04), 525-531.

Friend, M., & Keplinger, M. (2008). Reliability and validity of the Computerized Comprehension Task (CCT): data from American English and Mexican Spanish infants. *Journal of child language*, 35(01), 77-98.

Poulin-Dubois, D., Bialystok, E., Blaye, A., Polonia, A., & Yott, J. (2013). Lexical access and vocabulary development in very young bilinguals. *International Journal of Bilingualism*, 17(1), 57-70.

37 Early verbs in Telugu: Evidence from CS and CDS

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The current study explores the make-up of the ear-

ly verb lexicon in Telugu, a Dravidian language primarily spoken in south India (Krishnamurti, 1985). Although Telugu ranks third by the number of native speakers in India, to date, its acquisition has not been thoroughly studied (Steever, 2015). We analysed one-time naturalistic speech samples of spontaneous interactions between thirteen 27-35 month-old children (Male = 6, female = 7) and their mothers. The children were audio-recorded, and some video-recorded, during free-play, for a duration of 45-60 minutes. The recordings were transcribed by a native speaker, all verb-containing utterances in CS (N = 1,130) and CDS (N = 3,394) were isolated and the verbs - analysed. We used frequency counts and Pearson correlation to determine the fit between CS and CDS. The following findings emerge: (1) both the children and mothers extensively used (over 100 tokens per verb) only a small number of general purpose verbs (e.g., go, come, bring, give, do), while using all other verbs very sparsely; (2) the mothers and children had in common all 10 most frequently used verbs, of whom six dyads were highly correlated ($r = .8$, $p < .05$); (3) the input of most mothers was also highly correlated with that of their respective child ($r = .07$, $p < .05$); (4) the early verbs of the children and mothers belonged to a variety of semantic classes (activity, transfer, motion, emotion, verbs of saying); (4) most verbs were in the present or future tense, in the singular and with no gender specification. The early make-up of the Telugu verb lexicon corroborates findings reported for typologically different languages (e.g., English, Hebrew), and appears to be influenced by parental input. Thus, the current study adds data of a less studied language to the existing research on the early make-up of children's verb lexicon.

References

- Krishnamurti, Bh., & Gwynn, J. P. L. (1985). *A Grammar of Modern Telugu*. Oxford: Oxford University Press.
- Krishnamurti, Bh. (2015). Telugu. In S. B. Steever (Ed.), *The Dravidian Languages* (pp. 202-240). London and New York: Routledge.

38 Vocabulary instruction in groups of young children with developmental language disorders (DLD)

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Problem: Children with DLD learn words at a slower rate than typically developing children (Trauner, Wulfeck, Tallal & Hesselink, 2000). Often this difference in acquisition rate persists and accumulates over time (Rice & Hoffman, 2015). In order to increase vocabulary growth and school success, early vocabulary intervention is important. To date, no specific group interventions for children with DLD are available. Therefore, the didactics of Words Everywhere (Van den Nulft & Verhallen, 2009), originally designed for typically developing children with vocabulary delays, are used for children with DLD who visit playgroups and kindergarten groups of the Royal Dutch Auris Group in the Netherlands. The current study investigates how much time teachers spend on successful aspects of word learning (e.g. frequency of target word supply and the use of gestures), when they use Words Everywhere to increase vocabulary growth in groups of young children with DLD (2-6 years).

Method: Eleven professionals working at playgroups and kindergarten groups of children with DLD have participated. All teachers are individually interviewed, in order to gather their experiences concerning use of Words Everywhere. The interviews are followed by group observations of two days, during which participating professionals have been observed together with four to six children per group. In fixed order, participants have been observed successively during ten second time intervals. For each observation interval, aspects of activity, company and interaction have been coded in a specifically designed computer program.

Results & Conclusions: In the interviews, professionals have expressed uncertainty about the number of selected target words and the amount of repeated exposure. Preliminary analysis of the group observations show that target words occur in 8, 4% of all observation intervals. Inspection of all day activities offers opportunities to expand total target word supply by providing more target words and more repetition.

References

- Rice, M. L., & Hoffman, L. (2015). Predicting Vocabulary Growth in Children With and Without Specific Language Impairment: A Longitudinal Study From 2; 6 to 21 Years of Age. *Journal of Speech, Language, and Hearing Research*, 58, 345-359
- Trauner, D., Wulfeck, B., Tallal, P., & Hesselink, J. (2000). Neurological and MRI profiles of children with developmental language impairment. *Developmental Medicine and Child Neurology*, 42(7), 470-475.
- Van den Nulft, D., & Verhallen, M. (2009, 2nd revised ed.). *Words Everywhere/ Met Woorden in de Weer*. Praktijkboek voor het basisonderwijs. Bussum: Uitgeverij Coutinho.

39 Inuktitut Adaptation of the MacArthur-Bates Communicative Development Inventory

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Inuktitut is an Indigenous language of Canada with about 34,000 native speakers. Most Inuit children in the Eastern Arctic learn Inuktitut as their first language. However, there is a critical lack of research and assessment tools for Inuktitut (SAC, 2010). Therefore, we adapted the MacArthur-Bates Communicative Development Inventory: Words and Sentences (CDI) for use in Inuktitut, attending in particular to its linguistic and cultural appropriateness for the Indigenous setting.

Inuktitut is an agglutinative, polysynthetic language, and thus very different from the Indo-European languages which form the majority of CDI adaptations to date (Dale & Penfold, 2011). In addition, the cultural context in Nunavik results in significant differences in vocabulary used. Instead of beginning with translation from English and then adding culture-appropriate words, a wholly different approach to this adaptation was taken. The primary source for the first draft of the adaptation was longitudinal spontaneous speech data from eight Inuktitut-speaking children between the ages of 1;8 and 3;6 from northern Quebec, Canada.

As recommended by Ball (2007), the project developed indigenous research partnerships and worked with community members who served as research partners. We first conducted initial informal interviews to establish the overall cultural congruence of the CDI and its potential usefulness to the community. Then we conducted interviews and focus group meetings with native speakers with expertise in Inuktitut child language development to evaluate and suggest revisions to first draft of the questionnaire. The revised questionnaire was completed with 28 parents of Inuktitut-speaking children aged 1;6-4;2. We report on the successes and challenges in the development process, on the children's vocabulary and morphology acquisition, and on future steps for norming the questionnaire.

References

Ball, J. (2007). Aboriginal young children's language and literacy development: Research evaluating progress, promising practices, and needs. Paper prepared for the Canadian Language and Literacy

Networked Centre of Excellence, National Literacy Strategy.

Dale, P., & Penfold, M. (2011). Adaptations of the MacArthur-Bates CDI into non-U.S. English languages. Retrieved from <http://mb-cdi.stanford.edu/documents/AdaptationsSurvey2011.pdf>

SAC. (2010). Speech, Language and Hearing Services to First Nations, Inuit and Métis Children in Canada, with a Focus on Children 0 to 6 Years of Age. Ottawa: Speech-Language & Audiology Canada.

40 Lexical access and competition in bilingual children: The role of proficiency and the lexical similarity of the two languages

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Non-selective language access has often been shown in studies using visually presented words that share some features across languages, such as false friends. However, not much research has focused on auditory processing, especially in early and balanced bilinguals. The specific contribution of phonology alone, relative proficiency and experience in each language, and of the phono-lexical similarity between the two languages also needs to be better assessed. This study examines how languages are accessed and organized and affect one another in early child bilinguals who differ in proficiency, grade level, and language pair. Participants are tested in a picture-auditory word recognition task with false friends and semantically related words. Accuracy and response times are compared to control conditions within and across languages and grades. Study 1 tests the performance of school-age children with balanced vs. unbalanced knowledge of L1 Italian and L2 German. Study 2 compares unbalanced bilingual children with L1 Italian and L2 French or German to investigate the effect of L1/L2 similarity.

Bilinguals showed interference when presented with false friends, supporting the idea that language activation is simultaneous upon receiving an auditory stimulus. In general – and especially in the case of false friends and semantically related words – performance in one language was affected by proficiency level in the other, degree of similarity between L1 and L2, and length of experience with each language. The Bilingual Language Interactive

Network for Comprehension of Speech (BLINCS) model is invoked as a plausible framework for conceptualizing the nature of bilingual phono-lexical representation and its effect on word recognition.

41 Sibling influence on morphological development?

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Background and goal: Twins have been observed to have delays in their language development [1-2]. Their social environment at home, more specifically, the triadic interaction pattern that resulted in distracted and less joint attentional time with their care-takers, and relatively less amount of direct speech are discussed as a possible social reasons behind their delay [3]. In this study we examine two-year-old Turkish-speaking twins' morphological complexity and propose that extended exposure to a twin sibling's language, rather than the triadic interaction pattern at home, influences morphological development, Method: 10 Turkish-speaking monolingual children who had a twin sibling, 10 singleton children without siblings and 10 singletons with an elder sibling participated in the study. All participants were matched in terms of their age, birth weight and gestational age and were video recorded at home while they interacted with their family members. Three groups were compared in terms of the amount of direct speech and joint attentional time as well as the morphological complexity of their speech and the speech they hear. Morphological complexity was measured in terms of mean length of utterance and words. Results: Just as hypothesized, children who had twin siblings (but not the ones who had elder siblings) have shorter utterances and shorter words. Both twins and singletons with elder siblings received relatively less direct speech and joint attentional time than singletons without siblings. The morphological complexity of the adult speech directed to children was not different in three groups but there was a significant difference between the complexity of sibling language. Conclusion: Exposure to twin sibling's relatively less complex language has a negative influence on the morphological development of twins acquiring an agglutinating language.

References

Conway, D., Lytton, H., and Pysh, F. (1980). Twin-singleton language differences. *Canadian Journal of Behavioral Science* 12(3): 264-271.

Thorpe, K., Rutter, M., and Greenwood, R. (2003). Twins as a natural experiment to study the causes of mild language delay: II: family interaction risk factors. *Journal of Child Psychology and Psychiatry and Allied Disciplines* 44: 342-355.

Tomasello, M., S. Mannle, & A. C. Kruger. (1986). Linguistic environment of 1- to 2- year-old twins. *Developmental Psychology* 22(2): 169-176.

42 Scaffolding vocal development: maternal responsiveness to infant speech-like vocalizations at three, six and eight months

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A growing number of studies attest to the role of social interaction for the development of infants' preverbal vocalizations. Warlaumont et al. (2014) suggest a social feedback loop reinforcing infants' own communicative acts. Goldstein et al. (2009) have shown that phonological properties of infants' vocalizations are socially guided and Gros-Louis et al. (2006) showed that maternal responses are fine-tuned to the phonological characteristics of the infant's vocalizations. Yet, little is known about the scaffolding of infant vocalizations in even earlier stages of vocal development, even before the production of the first canonical syllables and whether maternal responses change along with the developing infant.

We analyzed interactions of 14 German mother-infant dyads filmed during diaper changing when the infants were 3, 6 and 8 months of age. We coded infants' language-like protophones and mothers' responses. We hypothesized that with time infants will produce more complex and advanced vocalizations. Furthermore, we expected that mothers will become more responsive to infants' vocalizations with their development. In line with our expectations we found that from visit to visit infants produce more advanced vocalizations like vowels, raspberries and babbles, while the amount of closants and yells is dropping. These differences however didn't reach significance. Furthermore, we found that mothers were very responsive to infants' vocalizations and didn't change their behavior throughout infants' development. Across 3 visits they responded to respectively: 81%, 72% and 76% of infants' language-like protophones (no significant differences). We are currently pursuing further analysis of this data, looking at whether there are differences in mothers' types of responses to different types of infant vocalizations. For this we look at categories of mothers' verbal responses, but also at other modalities like gaze, smile and touch.

References

Goldstein, M. H., & Schwade, J. A. (2008). Social feedback to infants' babbling facilitates rapid phonological learning. *Psychological Science*, 19, 515-523.

Gros-Louis, J., West, M.J., Goldstein, M.H., & King, A. P. (2006). Mothers provide differential feedback to infants' prelinguistic sounds. *International Journal of Behavioral Development*, 30, 509-516.

Warlaumont, A. S., Richards, J. A., Gilkerson, J., & Oller, D. K. (2014). A social feedback loop for speech development and its reduction in autism. *Psychological Science*, 25 (7), 1314-1324.

43 To /b/ or not to /b/: do two-year-olds represent the voiced-voiceless distinction in initial stops?

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In early speech production, Dutch children often substitute target voiced stops with their voiceless counterparts [/b/ ~ [p] and /d/ ~ [t]). These devoicing errors could result from an incomplete phonological representation of the voicing contrast, i.e. [+voice] is not specified yet, or by the inability to phonetically implement the [+voice] feature by ways of a correct Voice-Onset-Timing (VOT) value, which for Dutch is around -80ms. The present study uses, the experimental paradigm of Baese-Berk and Goldrick (2009), adjusted for Dutch children, to shed more light on which of the two proposed accounts could be held accountable for these devoicing errors. In the experiment, 36 target pictures of words starting with /b/ were presented either together with a picture of the minimal pair initial /p/ counterpart, or together with a picture of a word starting with a completely unrelated consonant. Eight girls and eight boys with a mean age of 23;15 months participated, and were encouraged to name the target pictures. It was found that even though both target initial /b/ and target initial /p/ were produced with positive VOT values, leading to perceived [p] in both cases, these values differed significantly from each other, indicating that children indeed possess an underlying representation of the voicing contrast. In addition, VOT values of target /b/words were significantly shorter when the target picture was presented together with the - unnamed - picture of the minimal pair /p/ word, than when it was presented with the picture of a word starting with a completely unrelated consonant. In the

minimal pair context, the phonological contrast was thus enhanced in the production. These results demonstrate that the voicing contrast is underlyingly represented, and that devoicing errors in Dutch children must therefore be due to problems at the level of phonetic implementation.

References

Baese-Berk, M. & Goldrick, M. (2009). Mechanisms of interaction in speech production. *Language and cognitive processes*, 24, 4, p. 527 – 554.

44 The acquisition of Hungarian word-medial /rt/ and /tr/ clusters

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The present study focuses on the developmental patterns of Hungarian word-medial /tr, rt/ clusters, where C1 is defined as a coda, and C2 as the onset of the adjacent syllable (Siptár & Törkenczy, 2007), and their possible relation to patterns of inter-word variability of singleton /r/. A total of 163 typically developing children aged from 3;0-5;11 years participated in the study, subdivided into six age groups. Stimuli consisted of words containing singleton /r/ in initial, medial, and final word positions and in at least six phonetic contexts, plus word-medial /rt/ and tr/ clusters. Items were elicited by a picture naming task, and words were audio recorded and transcribed broadly. Transcription-based analyses of individual patterns were conducted by age in terms of variability in the production of singleton /r/, defined by the degree of regularity in the use of target sound and the presence of error variability, and match and mismatch patterns for clusters. To justify findings on the perception-based analyses (cf. Scobbie, Gibbon, Hardcastle & Fletcher, 2000), vowel and consonant duration were measured and analyzed in target VCCV sequences that have been phonetically transcribed as ones showing mismatch with adult forms. Main findings were that clusters matched with adults targets in the number of timing units even in the younger age group. However, repair strategies affecting target CC sequences varied based on cluster type (with more substitution for /r/ in /tr/ cluster than in /rt/ cluster, and more compensatory lengthening for /rt/ cluster than for /tr/ cluster), and an interaction between age and cluster type (with gemination at younger ages, and vowel lengthening at older ages, for /rt/ cluster). Furthermore, consistency in accurate production of singleton /r/ correlated with the segmental match for the /tr/ cluster. Results will be discussed within the nonlinear phonological framework (by Bernhard & Stemberger, 1998).

References

Bernhardt, B. H. & Stemberger, J. P. (1998). *Handbook of phonological development. From a nonlinear constraints-based perspective.* San Diego, CA: Academic Press.

Scobbie, J. M., Gibbon, F., Hardcastle, W. J., & Fletcher, P. (2000). Covert contrast as a stage in the acquisition of phonetics and phonology. In M. B. Broe & J. B. Pierrehumbert (Eds.), *Papers in laboratory phonology V: Acquisition and the lexicon* (pp. 194–207). Cambridge: Cambridge University Press.

Siptár, P. & Törkenczy, M. (2000). *The phonology of Hungarian.* Oxford: Oxford University Press.

45 Relating the development of speech perception in noise to temporal-processing auditory capacities: Role of sensory, memory and decision factors

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Temporal cues (e.g., amplitude modulation, AM) play a crucial role in speech intelligibility for adults (1). How the ability to track these temporal cues develops and interacts with the development of speech perception is however unclear. Although aspects of AM processing appear to be mature as early as 3 months of age (2), children' ability to detect AM continues to improve until 10 years of age (3). The present study explores whether the development of AM processing is related to sensory or cognitive factors and how this ability relates to speech intelligibility in noise during childhood.

AM masking and temporal integration were measured to characterize sensory (AM encoding) and cognitive (memory and decision) mechanisms. Twelve normal-hearing children from 6 to 10 years and 21 adults completed three 3IAFC adaptive tasks. The first task assessed AM sensitivity using 3 modulation rates (4, 16, 32 Hz) and AM masking using 3 carriers varying in their inherent AM fluctuations (tones, narrowband noises with small inherent AM fluctuations and noises with larger fluctuations). The second task assessed temporal integration, the effect of increasing the number of AM cycles (duration) on AM detection using tones modulated at 4 or 32 Hz. Finally, thresholds for consonant identification were measured in speech-shaped noise using fricative consonants (/f/-/v/-/s/-/z/).

Preliminary results show differences in AM sensitivity between younger children and adults only when small fluctuations are introduced in the carrier. This suggests that sensory mechanisms constraining AM processing are mature by 6 years, but that some higher-level factors limiting AM processing (e.g., late internal noise) reach adult level around 10 years. Regarding the intelligibility of speech in noise, thresholds correlate only with temporal-integration capacities. Thus, central factors such as echoic-memory and decision-making capacities for AM may play a crucial role in the development of speech intelligibility in noise.

References

Rosen, S. (1992). Temporal information in speech: acoustic, auditory and linguistic aspects. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 336(1278), 367–373.

Levi, E. C., & Werner, L. A. (1996). Amplitude modulation detection in infancy: Update on 3-month-olds. *Abstracts of the Association for Research in Otolaryngology*, 19, 142.

Hall III, J. W., & Grose, J. H. (1994). Development of temporal resolution in children as measured by the temporal modulation transfer function. *The Journal of the Acoustical Society of America*, 96(1), 150–154.

46 Early evolution of syllable duration as a cue for oro-motor control development: a longitudinal study

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The first identifiable syllables appear at the beginning of the babbling stage and arise from lowering and raising gestures of jaw associated with phonation (MacNeilage, 1998). But at this stage of development, the articulatory motor control is far from being acquired. The poor efficiency of the motor system is particularly visible through slower movements of the articulators (Nip et al., 2009, 2011). On the other hand, at around one year of age, jaw movement patterns are quite similar to those of adults for speech activity (Green et al. 2002). An acceleration of jaw oscillation (and hence the syllable duration)

would then be expected during the babbling period. To test this hypothesis, we carried out monthly audio recordings of productions of 20 French children (10 boys - 10 girls) from 8 months to 14 months of age. Approximately 13.500 syllables have been extracted from the corpus, annotated (phonetic transcription, utterance structure: monosyllabic vs. polysyllabic, reduplicated vs. variegated, syllable position in the utterance, syllabic structure) and temporally analyzed. An ANOVA with repeated measures showed a significant decrease in syllable duration between 8 and 14 months. This decrease was not linked to changes in syllabic structures: the structure distribution remained relatively stable during the investigated period with a clear predominance of CV and V types. A small increase of complex syllable structures appeared between 8 and 14 months of age, from 5% of the sample at the beginning of the study to 7% at the end. Furthermore, syllable durations, whatever their structure, decreased with age, with the exception of V syllables that remained constant.

Between 8 months and 14 months, the child seems to achieve a more controlled mandibular movement. Nevertheless, the process of motor control is not accomplished yet. Jaw displacements still have to accelerate to attain adult speed.

References

Green, J. R., Moore, C. A., & Reilly, K. J. (2002). The sequential development of jaw and lip control for speech. *Journal of Speech, Language, and Hearing Research*, 45(1), 66–79.

MacNeilage, P. F. (1998). The frame/content theory of evolution of speech production. *Behavioral and Brain Sciences*, 21(04), 499–511.

Nip, I. S. B., Green, J. R., & Marx, D. B. (2011). The co-emergence of cognition, language, and speech motor control in early development: A longitudinal correlation study. *Journal of Communication Disorders*, 44(2), 149–160. <http://doi.org/10.1016/j.jcomdis.2010.08.002>

This study explores pragmatic development of child's discourse in narratives consecutive to the emergence of literacy. In written text, anaphora is frequently used to express coreference relations. Through reading stories, children may develop their ability to express coreference using strategies typical of written language. On the other hand, before learning to read, parents constitute the first models for the way we deal with characters in narrative. Thus, two hypotheses are considered: new readers adopt different strategies from their nonreader peers to express reference; and children are influenced by the way parents tell stories in elaborating their own narratives.

Children and parent's narratives were observed within this exploratory study. 10 children with one of their parents took part in this study: 7 children in first grade (age 6) who had learned to read for less than one year and 3 nonreader children in their last year of kindergarten (age 5). Two textless books were used, children told the first one to the experimenter individually while the other one was told by parent and child together. The aim was to analyze the different referential expressions used and their frequency according to characters and their apparition context (introduction, maintaining, reintroduction).

All children regardless on their reading level adopted a thematic strategy (Karmiloff-Smith, 1981); they strongly focused on the main character and anaphoric strategies were not frequent. However, in the individual narrative, readers tended to use specific constructions like dislocations they did not use with the parent. As children and parents' strategies were overall close, that confirmed our second hypothesis: children are influenced by parental models. These results, suggesting that children with some reading experience begin to develop strategies that differ from the models offered by their parents, call for a new study on a larger corpus.

References

Bamberg, M. (1986). A functional approach to the acquisition of anaphoric relationships. *Linguistics*, (24), 227–284.

Hickmann, M. (2002). *Children's discourse: Person, space and time across languages* (Vol. 98). Cambridge University Press.

Jisa, H. (2000). Increasing cohesion in narratives: A developmental study of maintaining and reintroducing subjects in French. *Linguistics*, 38(3), 591–621.

Karmiloff-Smith, A. (1981). *A functional approach to child language*. Cambridge: Cambridge University Press.

ZONE 3

47 Influence of reading acquisition and parent's models on the use of referential expressions in children's narratives

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48 The effectiveness of a short training with beat gestures in improving children's narrative discourse skills

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There is consensus evidence that gestures and prosody are important precursors of children's early language abilities and development. Previous literature has revealed the beneficial role of beat gestures in the recall of information by preschoolers (Austin & Sweller, 2014). However, to our knowledge, little is known about whether the use of beat gestures can promote children's linguistic abilities and specifically whether training with beat gestures can boost children's narrative skills. We believe that the focus marking and the discourse structure marking functions of beat gestures (Shattuck-Hufnagel, Ren, Mathew, Yuen, & Demuth, 2016) are at the root of their beneficial effects in language development. The aim of this study was to examine whether children could benefit from observing beat gestures when performing a posttest narrative task.

Forty-four 5- and 6-year-old children participated in a between-subject training study with a pretest and posttest design. They were exposed to a training phase which contained a total of six one-minute stories, presented under two between-subject experimental conditions: 1) No-beat condition, e.g., narratives performed with prosodic prominence and no beat gestures in target positions; and 2) Beat condition, e.g., narratives performed with prosodic prominence and beat gestures in target positions within the story.

Results demonstrated that children who were exposed to the Beat training condition showed a significant gain in the quality of their posttest narratives of wordless cartoons; that is, better narrative structure scores, better fluency scores, and a higher production of co-speech gestures. Therefore, it is shown that a brief training with beat gestures has positive effects on the short-term narrative discourse abilities.

References

Austin, E., & Sweller, N. (2014). Presentation and production: The role of gesture in spatial communication. *Journal of Experimental Child Psychology*, 122(1), 92-103.

Shattuck-Hufnagel, S., Ren, A., Mathew, M., Yuen, I., & Demuth, K. (2016). Non-referential gestures in adult and child speech: Are they prosodic? *Proceedings of Speech Prosody 2016*. Boston, USA, May 31-June 3, 2016.

49 Precursors and beginnings of language variety awareness in children

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The perception and awareness of language variation in adults has gained much research interest in the past several years, also in the German-speaking areas, where diatopic variation is still well and alive. However, little is known about the acquisition of awareness of sociolinguistic variation: Can children even discriminate acoustically between dialect and standard language? Have they formed distinct (generalised) categories for them? And what knowledge about language varieties can they consciously access and explicitly articulate? Data from other speech communities indicate that infants as young as five months can discriminate their own and a non-local variety (e.g., Butler et al. 2011) but that this ability declines shortly after (e.g., Phan/Houston 2008). Findings are not entirely conclusive as to when exactly this discrimination ability reappears. Most evidence currently points to the age range between 4 and 6 years and the exact trajectory of children's discrimination abilities may correlate with the amount of input they receive in the different varieties (Kitamura et al. 2006). We studied Austrian preschool children's (aged 3-6) implicit and explicit awareness of the different (German) language varieties surrounding them. Children were asked to match speakers using two different varieties (standard German and the local Bavarian dialect) in two ABX discrimination tasks and they were also interviewed on their knowledge of and associations with the terms "Dialekt" ("dialect") and "Hochdeutsch" ("standard German"). Our results suggest that the emergence of abstract categories for varieties is a gradual process: 4-year-olds can decide at an above-chance level whether identical sentences spoken by different speakers are in the same or a different variety but even 6-year-olds cannot generalise across speakers AND utterances. Moreover, preschoolers do not seem able to explicitly articulate metalinguistic knowledge about sociolinguistic variation. We argue that grasping sociolinguistic variation in Austria may be complicated by the highly mixed and blurred varieties children encounter in their input as well as the non-categorical information on their socio-indexical meaning in the Austrian context.

References

Butler, J., Floccia, C., Goslin, J., & Panneton, R. (2011). Infants' discrimination of familiar and unfamiliar accents in speech. *Infancy*, 16, 392-417.

Kitamura, C., Panneton, R., Diehl, M., & Notley, A. (2006). Attuning to the native dialect: when more means less. In P. Warren & C. I. Watson (Eds.): *Proceedings of the 11th Australasian International Conference on Speech Science & Technology*, University of Auckland, New Zealand, December 6-8, 2006 (pp. 124-129). Australian Speech Science & Technology Association.

Phan, J., & Houston, D. (2008). *Infant Dialect Discrimination. Research on Spoken Language Processing. Progress Report No. 29.* Bloomington: Indiana University, Speech Research Laboratory.

50 Cancelled

51 Cross Situational Learning and Individual Differences in Language Development

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One common proposal for how children deal with the ambiguity inherent in word-learning is cross-situational word learning (Smith & Yu, 2008). While several studies have shown that infants are capable of learning word-referent pairings on the basis of ambiguous statistical information, very little research has considered whether performance on this task is related to prior or concurrent language proficiency (though see Smith and Yu 2013). As part of a larger longitudinal study that is investigating sources of individual differences in language acquisition, we have been examining concurrent and longitudinal predictors of cross-situational word learning in 15 month old infants. Specifically, here we examine whether early speech processing ability and/or early vocabulary knowledge predict success on the task. The children's speech processing was measured at 9 months using ERPs, and their vocabulary was measured from 9 months onwards every 3 months until 15 months. Cross

situational learning at 15 months was tested with a modified version of Smith and Yu's (2008) paradigm.

While data collection is ongoing, preliminary analyses have been conducted on a 61 fifteen-month old native speakers of Australian English. For each participant, we calculated the proportion of words learned based on eye-tracking data, and analysed these proportions using generalized linear models with beta-distributed errors. Performance on the speech processing task was related to the proportion of words learned. Infants with more mature electrophysiological responses to speech at 9 months learned a larger proportion of words at 15 months than did those with less mature responses. Surprisingly, neither concurrent vocabulary size nor growth in vocabulary between 9 and 15 months were related to the proportion of words learned. These results suggest that performance on the cross-situational learning task is affected by individual differences in the ability process speech.

References

Smith, L., & Yu, C. (2008). Infants rapidly learn word-referent mappings via cross-situational statistics. *Cognition*, 106(3), 1558-1568. doi:10.1016/j.cognition.2007.06.010

Smith, L. B., & Yu, C. (2013). Visual attention is not enough: Individual differences in statistical word-referent learning in infants. *Language Learning And Development*, 9(1), 25-49. doi:10.1080/15475441.2012.707104

52 Uncertainty before certainty: Evidence from Russian and Estonian L1

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There are but few studies on the acquisition of epistemic modality (EM) (Choi 2006, Matsui 2014, Hickmann & Bassano 2016). New findings from preliminary comparative analysis of 4 Russian and Estonian children have disproved one of the accepted rules in this sphere, since it was shown that the acquisition of uncertainty preceded acquisition of certainty (Kazakovskaya & Argus 2016). In this study we continue to compare the early development of certainty/uncertainty in longitudinal spontaneous speech corpora (transcribed in CHILDES) based on greater data, deeper methodology and statistical analysis. Richly inflected Russian and agglutinating and inflected Estonian have similar epistemic repertoires, but a varying degree of grammaticalisation of evidentiality.

The naturalistic data of 6 TD monolingual children (1;3–6;1) from middle SES families was analysed relative to emergence of initial markers (including their positions and the degree of expression of semantics); further development of both micro-fields (focusing on semantic and communicative features of relevant utterances); similarities and differences in epistemic development; the input-output relationship within frequency and diversity (including fine-tuning) and correlation 'CS—CDS—ADS'.

Developmental analysis of EM has supported the order of emergence: uncertainty before certainty. First markers become the most frequent: *naverno/vist* 'probably' in uncertainty, *konečno/muidugi* 'of course' in certainty. Epistemic marking begins after 2;0 (MLU=3.5±0.4) mostly with high-degree markers within non-interrogatives and without positional preferences. Children's epistemic evaluation develops from objective situations/its components (he/she/it-utterances, 73%) to mental reflection concerning their partner (you-utterances, 7%) through I-sentences (20%), using mental and modal verbs. The input-output relationship reveals the influence of frequency ($p < 0.001$) and diversity ($p < 0.01$). The sequence of EM emergence in CS coincides with their frequency in CDS and almost completely in ADS. The lack of striking differences in epistemic acquisition in both languages allows us to conclude that typological differences are less significant for this process, in contrast to input frequency, prototypicality of markers, communicative styles and cultural norms.

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References

- Choi, S. (2006). Acquisition of Modality. In W. Frawley (Ed.), *The Expression of Modality* (pp. 141-171). Berlin: Mouton de Gruyter.
- Hickmann, M., & Bassano, D. (2016). Modality and Mood in First Language Acquisition. In J. Nuyts, J. van der Auwera (Eds.), *The Oxford Handbook Modality and Mood* (pp. 430-447). Oxford: Oxford University Press.
- Kazakovskaya V., & Argus, R. (2016). Acquisition of epistemic marking in Estonian and Russian. *Eesti Rakenduslingvistika Uingu Aastaraamat [Estonian Papers in Applied Linguistics]*, 12, 57-80. DOI 10.5128/ERYa12.04.
- Matsui, T. (2014). Children's Understanding of Linguistic Expressions of Certainty and Evidentiality. In D. Matthews (Ed.), *Pragmatic Development in First Language Acquisition* (pp. 295-316). Amsterdam: John Benjamins Publishing Company.

53 Conversational skills: Detection of turn-taking violation in 6-month-old infants

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Turn-taking is an important characteristic of everyday life communication. During a conversation, speakers and listeners alternate smoothly their roles and participants avoid overlaps and extensive gaps between conversational turns (Sacks et al, 1974). A child needs more than 3 years to handle turn-taking skills although alternated vocalizations between a child and his/her parents become predominant before a child is 9 months old (Casillas et al, 2015; Jasnow, 1986). Our experiment aimed to assess the ability of 6-month-old infants to perceive a breach of turn-taking characteristics, namely an overlap. To do so, the infants (N=40) watched videos of three sketches in which two women spoke to them. Three different situations were presented to each infant: 1) the first speaker turned toward the second to allow her to speak; 2) the second speaker started speaking right at the end of the first speaker's sentence; 3) the second speaker started speaking before the end of the first speaker's sentence (=overlap). The pictures of both speakers were presented side by side before and after each sketch. Sketches were shown in a random order and speakers differed between sketches. We measured the time infants looked at each speaker before and after each sketch. Six-month-old infants looked longer to the second speaker after she realized an overlap in the conversation. However, this behavioral response was only observed when the infants had previously seen two sketches with a respected turn-taking. Thus, their reaction to an overlap depended on their short-term experience. Six-month-old infants need to be exposed to correctly alternated turns to detect subsequently a breach in an interaction. Nevertheless, this suggests that the precursor of overlap perception by infants occurs around 6 months, even before they are able to alternate smoothly their vocalizations with their parents.

References

- Casillas, M., Bobb, S. C., & Clark, E. V. (2016). Turn-taking, timing, and planning in early language acquisition. *Journal of Child Language*, 43(06), 1310-1337.

Jasnow, M., & Feldstein, S. (1986). Adult-like temporal characteristics of mother-infant vocal interactions. *Child Development*, 57(3), 754–761.

Sacks, H., Schegloff, E. A., & Jefferson, G. (1974). A Simplest Systematics for the Organization of Turn-Taking for Conversation. *Language*, 50(4), 696–735.

54 Cancelled

ZONE 4

55 The sensitive period for associative learning of non-adjacent dependencies in the linguistic and non-linguistic domain

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Infants effortlessly learn their native language within just a few years, having remarkable language learning abilities. The ability to extract and generalize abstract rules between non-adjacent elements in predictive sequences is present early in life: Our previous event-related potentials (ERPs) studies revealed that 3- to 4-month-old infants discriminate grammatical from ungrammatical dependencies following only brief exposure. In contrast, adults did not show grammar learning under passive listening, but required an explicit grammaticality judgment task (Friederici, Mueller, & Oberecker, 2011; Mueller, Friederici, & Männel, 2012). This evidence inevitably leads to the question of the differences between infant and adult learning. Here, delayed maturation of the prefrontal cortex has been proposed as major developmental determinant (Ramscar & Gitcho, 2007). Increase in cognitive control upon prefrontal cortex maturation may lead to a change from infant associative learning, rooted in temporal cortices, to more controlled learning in adults.

To date, there is no evidence on the developmental trajectory from purely associative to more controlled grammar learning. Employing ERPs, we will determine when during children's first three years of life this switch in learning mechanisms occurs; optical imaging will reveal information about the different underlying neural bases. Moreover, we will assess whether non-adjacent dependency learning follows the same trajectories in the linguistic and non-linguistic domains. For the linguistic domain, we study grammar learning in Italian as a non-native language. First ERP data suggest that at 3 years of age, children have lost the ability of purely associative learning, as they did not show different brain responses to grammatical and ungrammatical dependencies under passive listening. For the non-linguistic domain, we use tone sequences that mimic the non-adjacent dependency patterns of the linguistic experiment. Parallel findings in both domains as a function of age would suggest a domain-general change of the learning mechanism during development.

References

Friederici, A. D., Mueller, J. L., & Oberecker, R. (2011). Precursors to natural grammar learning: preliminary evidence from 4-month-old infants. *PLoS ONE*, 6(3), e17920.

Mueller, J. L., Friederici, A. D., & Männel, C. (2012). Auditory perception at the root of language learning. *Proceedings of the National Academy of Sciences of the United States of America*, 109(39), 15953–15958.

Ramscar, M., & Gitcho, N. (2007). Developmental change and the nature of learning in childhood. *Trends in Cognitive Sciences*, 11(7), 274–279.

56 Topicality makes the subject salient: The key to the universal subject preference in the acquisition of relative clauses

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Whether there is a universal preference for subject relative clauses (RCs) has been an ongoing debate. With the unusual combination of prenominal RC construction and VO word order, the Chinese languages (such as Mandarin Chinese and Cantonese) spark new predictions on the acquisition of RCs. Based on the shorter distance between the dependencies in object RCs, memory-based accounts (e.g. Hsiao & Gibson, 2003) have predicted an object RC preference for the Chinese languages, running

counter to the universal subject preference hypothesis (e.g. Keenan & Comrie, 1977).

This study examined the acquisition of Cantonese RCs by investigating the comprehension and production of subject, object and indirect object RCs of Cantonese-speaking children (n=48, age:4;05.28-6;07.24, mean:5;06.03) using character selection and elicited production tasks. The results show that children not only find subject RCs easier to comprehend and to use in their speech; they also prefer to use subject RCs over other types of RCs. While errors in comprehension demonstrated that children had a strong tendency to misinterpret the head as the subject, the alternative strategies observed in elicited production suggest that children would rather use a syntactically more complex construction (such as passive) in order to respond with a pragmatically appropriate subject RC, and avoid relativization from the less preferred positions.

Despite the typological peculiarities of its RC construction, Cantonese aligns with other languages in demonstrating a subject preference in the acquisition of RCs, lending support to the hypothesis of a universal subject preference. Among the accounts considered, the prevalence of the subject RCs can best be accounted by the Topicality Hypothesis (Mak et al., 2006): being the usual default topic of a sentence, the subject matches the expectation for the head of an RC to be about the prominent topic of the sentence. Consistency with these expectations facilitates processing of the RC, hence the relative ease of subject RCs.

References

- Hsiao, F., & Gibson, E. (2003). Processing relative clauses in Chinese. *Cognition*, 90, 3–27.
- Keenan, E., & Comrie, B. (1977). Noun phrase accessibility and universal grammar. *Linguistic Inquiry*, 8, 63–99.
- Mak, W. M., Vonk, W., & Schriefers, H. (2006). Animacy in processing relative clauses. *Journal of Memory and Language*, 54, 466–490.

57 Syntactic operations in early acquisition of complex constructions: Reported Speech in Spanish

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Reported Speech (RS) occurs overall in narrative contexts, reproducing other's previous utterances,

either in direct or indirect style (Coulmas 1986; Evans 2010). Less frequently, RS occurs in speech planning events, and refers to other and self utterances. In either case or direction, RS involves referring to displaced referents, speakers and utterances, and may demand indexical shifts in personal and spacio-temporal-modal devices (Sakita 2002). Children are expected to only late produce both RS construction frames and operate the needed indexical adaptations (Diessel 2004; Tomasello 2005).

This presentation offers data from a naturalistic database (ETAL, Rojas-Nieto 2007), on how two monolingual educated middle-class children (2-4 years old) acquiring Mexican Spanish early adopt RS constructional frames and selectively do the required syntactic adaptations.

Children around 30 months produce a wide diversity of RS constructional frames that may include syntactic adjustments associated with the acquisition of complex sentences: personal (1), temporal (2), modal (3) and lexical shifts (4), along with possible combinations of all these.

- (1) No, dice que no te va a traer nada.
'No, he says he won't bring you anything'
- (2) Me dijo Cuca que se iba a hacer popó la perrita.
'Cuca told me that the doggy would poop'
- (3) Dice Lechu que guardes tu cachorro. 'Lechu says that you should put away your dog'
- (4) Dice que me quede contigo. 'He told me to stay with you' (Original: Wait there!)

Analyses of RS constructions and the syntactic adaptations children produce unveil a wide formal diversity. Children incorporate both RS frames and some blended constructions. They variously and gradually focus on items to be changed. The selective and gradual shifts they realize point to the early constructional slots the child has opened to work upon in RS constructions, and the aspects of language in child's focus of attention and action.

References

- Diessel, H. (2004). *The Acquisition of Complex Sentences*. [Cambridge Studies in Linguistics 105]. Cambridge: Cambridge University Press.
- Rojas-Nieto, C. (2009). Before Grammar. Cut and paste in early complex sentences. In J. Grinstead (Ed.). *Hispanic Child Languages: Typical & Impaired Development [Language Acquisition & Language Disorders 50]* (143–174) Amsterdam: John Benjamins.
- Tomasello, M. (2003). *Constructing a language. A usage-based theory of language acquisition*. USA: Harvard University Press.

58 Effects of Lexical Diversity on Argument Structure Acquisition

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Why do children show lexically-general use of some argument structures before others? One hypothesis is that lexical diversity provides evidence of productivity, which would reinforce lexically-general representations. If so, greater lexical diversity should lead to better generalization. However, so far the research in support of this hypothesis uses corpus-based estimates of lexical diversity. This study directly manipulates lexical diversity using a language learning paradigm.

English-speaking 5- and 6-year-olds learned a Subject-Object-Verb argument structure to describe caused pose changes (e.g., cause to turn around). Cartoons depicting animals enacting six distinct verbs were created using Anime Studio. A female native English speaker described each event using the novel argument structure. Following Casenhiser & Goldberg (2005), two learning conditions featuring 8 scenes, each presented twice, were created. In the low diversity condition, 16 children heard two verbs with pronominal objects (e.g., The pig him pilks). In the high diversity condition, 16 different children heard four verbs with full NP objects (e.g., The pig the dog pilks). At test, children selected which of two videos matched the audio. All participants saw the same test trials: four with verbs from the learning phase paired with pronominal objects and four with new verbs and NP objects. If diversity supports generalization, children in the high diversity condition should outperform children in the low diversity condition on new verb trials.

Accuracy data were analyzed using a logit mixed model with age and the interaction of learning condition and test trial type as fixed factors, and participant and trial as random effects. The analysis found a significant main effect of trial type ($z=2.64$, $p=.008$) and a significant interaction of trial type and learning condition ($z=2.07$, $p=.038$). Learners who heard a range of verbs and diverse objects showed better generalization to new verbs. Lexical diversity supports argument structure generalization.

References

Casenhiser, D. & Goldberg, A. E. (2005). Fast mapping between phrasal form and meaning. *Developmental Science*, 8, 500-508.

59 Cancelled

60 The perception of discontinuous dependencies by 18 months-old: on the process of acquiring periphrastic verbal passives

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This paper presents an experimental study on the early perception of the discontinuous dependency of verbal passives. In a number of languages, passives present a morphophonological complex Auxiliary+V-participle. Previous studies on speech perception demonstrated that 18 month olds are able to process other correlated non-adjacent elements at a similar distance (Santelmann & Jusczyk, 1998; Höhle et al., 2006). However, young children's sensitivity to the non-adjacent dependency in verbal passives has not been investigated so far. Such an investigation is essential in the context of a procedural account that assumes the identification of their morphophonological pattern to be the first step in the process of acquiring the necessary grammatical features to parse verbal passives (Corrêa, Lima Júnior & Augusto, 2016). In the present study, the sensitivity of monolingual children acquiring Portuguese to this particular dependency is investigated. Therefore, an experiment was conducted in the preferential attention paradigm. 22 children, equally divided into 2 age groups (Group A(13-15months) - Group B (17-20months), listened to two types of stories (normalXmodified). The normal ones contained sentences with the passive complex (Aux_foi+V-do). In the modified ones, the participial morpheme was substituted by the imperfective past tense morpheme (-va), giving rise to the ungrammatical complex (*Aux_foi+V-va). If children are sensitive to the Aux_foi+V-do pattern, the listening time in the two story conditions is expected to be different. Statistical results of 2 (age) X 2 (type of story) show a main effect of both variables tested. Longer listening times were obtained in the normal condition and the oldest group had longer listening times than the youngest one. Only children in group B were, nevertheless, sensitive to the discontinuous dependency at stake since it was in this group that the difference between listening times was significant. In conclusion, the first step in the development of passives seems, therefore, to be accomplished by 18 months of age.

References

Corrêa, LMS, Lima Júnior, JC & Augusto, MRA. (2016) A aquisição da linguagem por meio do processamento de informação das interfaces: sobre o processo de aquisição de passivas. *Scripta*, vol. 20, n. 38, 306-336.

Höhle, B, Schmitz, M, Santelmann, LM & Weissenborn, J. (2006) The recognition of discontinuous verbal dependencies by German 19-month-olds: Evidence for lexical and structural influences on children's early processing capacities. *Language Learning and Development*, 2 (4), 277 – 300.

Santelmann, LM, Jusczyk, PW. (1998) Sensitivity to discontinuous dependencies in language learners: Evidence for limitations in processing. *Cognition*, 69, 105-134.

61 Differential Associations between Cognitive Skills and Language at the Semantic vs. Discourse and Syntax Levels

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Theoretical accounts supporting connections between cognitive skills and language include dynamic systems accounts (Nelson & Arkenberg, 2008; Thelen & Smith, 1994), which posit that language development is supported by domain-general cognitive skills. However, an open question is how individual cognitive skills, ranging in terms of complexity of executive function (EF) processes recruited, contribute to various emerging language structures. The current study addresses this question by examining how a differentiated set of cognitive skills, as measured by performance on five relatively simple EF tasks and two more complex EF tasks, account for variability in vocabulary (word-level language skills) narrative (discourse-level language skills) and complex syntax performance in children.

Participants in the current study included 84 typically developing children between the ages of 3.5 and 6 years ($M = 4.5$ years, $SD = 0.62$ years). A stepwise regression using a backward elimination approach was used to identify the best models. Results indicated that both narrative skills and complex syntax skills for these children were supported by the more complex EF skills involved in the Dimensional Change Card Sorting task and by a Verbal Fluency semantic category production task; the two most complex tasks in our cognitive assessment battery. In contrast, tasks categorized as relatively simple EF tasks, but neither of the two complex EF tasks, were significant predictors for vocabulary skills. These results indicate that more sophisticated narrative skills and syntax skills are associated with stronger foundations of advanced EF skills, and that semantic/vocabulary skills are not accounted for by these higher order EF skills. Future theoretical and empirical work is needed to more fully understand

how various conditions, including multiple levels of cognitive readiness and functional connectivity, as well as social, motivational, engagement, and contextual factors, dynamically support the development of all domains of language skills in children.

References

Nelson, K. E., Arkenberg, M. E., Mody, M., & Silliman, E. (2008). Language and reading development reflect dynamic mixes of learning conditions. *Brain, behavior, and learning in language and reading disorders*, 315-348.

Thelen, E., & Smith, L. B. (1994). MIT Press/Bradford book series in cognitive psychology. A dynamic systems approach to the development of cognition and action.

62 Cancelled

63 Investigating associations between self-regulation and language development in infancy – findings from the FinnBrain Study

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Previous research has reported a bidirectional relation between self-regulation skills and language ability in children (Bohlmann, Maier, & Palacios, 2015). Language is thought to support self-regulation in enabling the child to use internal speech in order to regulate behavior and emotions. Correspondingly, self-regulatory capacity is assumed to support language development by facilitating learning from the environment (Blair, 2002). Although the foundations for self-regulation development are present already during infancy (Rothbart et al., 2011), to our knowledge the possible existence of the relations between self-regulation and language skills in infancy has not yet been studied. The first developing skill of self-regulation in infancy is the ability to use attention in regulating negative affect (Rothbart et al., 2011). At this age, the infant develops an ability to shift attention away from a stimulus causing distress or towards a rewarding stimulus. The present study will investigate the relation between self-regulation ability and language skills

in 325 infants (coding process ongoing). Self-regulation by orienting is assessed by measuring gaze aversion in infants at 8 months in the frustration-eliciting Arm Restraint frustration task from the Lab-TAB (laboratory temperament assessment battery). In this task, the child is prevented from playing with a toy by a parent who gently holds the infant's arms. Language skills are assessed at 14 months using the MacArthur-Bates Communicative Development Inventories (CDI) parent report. The hypothesis is that children with higher gaze aversion at 8 months, indicating an emerging ability of self-regulation, will have stronger language skills at 14 months. Results of the study will contribute to the current literature by providing new knowledge on the possible interactions between self-regulation and language development in early childhood.

References

Blair, C. (2002). School readiness: Integrating cognition and emotion in a neurobiological conceptualization of child functioning at school entry. *American Psychologist*, 57, 111-127.

Bohlmann, N.L., Maier, M.F., & Palacios, N. (2015). Bidirectionality in self-regulation and expressive vocabulary: Comparisons between monolingual and dual language learners in preschool. *Child Development*, 86, 1094-1111.

Rothbart, M.K., Sheese, B.E., Rueda, M.R., & Posner, M.I. (2011). Developing mechanisms of self-regulation in early life. *Emotion Review*, 3, 207-213.

64 Within-Subjects Measures of Dialect Perception Across the Lifespan

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Adult listeners show an effect of dialect familiarity on speech processing, are able to classify talkers by dialect with above-chance accuracy, and regularly rate speakers of nonstandard dialects higher on solidarity-related personality traits, but lower on status-related traits. Studies investigating children's development of each of these perceptual skills suggest slow trajectories towards adult-like behavior throughout childhood. The current study examined the relationship between the developmental trajectories of these skills using a within-subjects design to obtain a more coherent perspective on the development of sociolinguistic competence. Participants (N=303, age range 4-74 years, largely from the U.S. Midland dialect region) completed three tasks in which they responded to speech from four regional dialects of American English: Midland, Mid-Atlan-

tic, Southern, and Northern. In a speech intelligibility task, participants heard words in noise and reported what they heard. In a speaker rating task, participants heard talkers reading a sentence and rated them for geographic locality, intelligence, and friendliness. In a dialect classification task, participants sorted talkers into groups based on where they sounded like they were from. While there are phonetic differences between all four dialects, the results suggest that the Southern dialect, which is commonly stigmatized as non-standard, was the most perceptually distinct. Adults showed a tendency to group Southern talkers together and rated them as sounding significantly less local than the other talkers. Both of these patterns began to emerge by late-childhood, with children as young as eight showing adult-like locality ratings. Locality ratings also had an effect on friendliness and intelligence ratings, suggesting that geographical knowledge contributes to language attitudes throughout development. These results confirm that the ability to distinguish and evaluate regional dialects develops throughout childhood, and suggest that dialect perception may be influenced not only by phonetic variation, but also by the social salience of particular regional varieties.

65 Get-Passives in Child English: Raising or Control?

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While the acquisition of the be-passive (1a) has been the subject of much research, the get-passive (1b) has not. Limited data on children's comprehension of get claims that children acquire this passive early (Harris & Flora 1982; Fox & Grodzinsky 1998).

- (1) a. Elmo was caught by Big Bird.
b. Elmo got caught by Big Bird.

The goal of this study is (i) to follow up on previous research to determine when children acquire get relative to be and (ii) to determine what kind of structure children assume for the get-passive. While most analyses of the get-passive in the adult grammar assume a raising structure (2) viz. Haegeman (1985), it is possible that children assume a control structure (3) cf. Butler & Tsoulas (2006), as it is well-known that children have difficulties with raising.

(2) Elmo got [Elmo caught Elmo].

(3) Elmo_i got [PRO_i caught].

A picture-matching task with 59 children ages 3-6 years old was conducted; children received prompts featuring reversible, long actional get- and be-passives, with animate and inanimate subjects. Results reveal that 3-year-olds are only above chance with get-passives with animate subjects. This is consistent with a control analysis in the youngest children's grammar, suggest-

ing that early get- “passives” are in fact control/causative constructions that select for an agentive subject.

Table 1. Picture-Matching Results

Age	Get-Animate	Get-Inanimate	Be-Animate	Be-Inanimate	Active
3-years	73%	58%	64%	51%	92%
4-years	83%	69%	71%	70%	93%
5-years	84%	73%	73%	78%	92%
6-years	92%	87%	82%	85%	91%

Children 4-6 years perform above chance with both get- and be-passives. There is no significant main effect of verb ($p = 0.20$). This indicates that there is no inherent “advantage” to get after children have acquired the passive, contra previous claims in the literature.

References

- Fox, D., & Grodzinsky, Y. (1998). Children’s passive: A view from the by-phrase. *Linguistic Inquiry*, 29.
- Haegeman, Liliane. (1985). The get-passive and Burzio’s generalization. *Lingua* 66, 53-77.
- Harris, F. & Flora, J. (1982). Children’s use of get-passives. *Journal of Psycholinguistic Research*, 11.

66 Procedural memory in the gifted child

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Gifted children are often described as children who are very talented and who achieve or have the potential to achieve more than their age mates in one or more domains (Steiner & Carr 2003). These children are identified by a wide range of characteristics, but probably all have some cognitive advantage enabling them to excel in different domains. A relatively better procedural memory, which is involved in the implicit recognition of abstract rules in several domains, including language, might be responsible for their giftedness.

To investigate this, 25 Dutch speaking gifted children (9 males, $M = 10;6$, $SD = 1;2$) were compared to 25 Dutch speaking typically developing (TD) children (10 males, $M = 10;9$, $SD = 1;2$). A Serial Reaction Time (SRT; Lum et al. 2014) task measured procedural memory in the visual-motor domain. A comprehension task measured competence of Dutch object relative clauses, which can only be interpreted on the basis of subject-verb

agreement (Dit is de piraat die de clowns slaat. ‘This is the pirate who hits the clowns.’ vs. Dit is piraat die de clowns slaan. ‘This is the pirate who the clowns hit.’), to investigate their grammatical knowledge.

Results from the SRT showed no difference between gifted children and their TD peers, whereas gifted children showed better comprehension of object relative clauses. Furthermore, results from these tasks did not correlate. This might be the case, because gifted children have more experience with object relative clauses than the TD group. Comprehension of these sentences correlated with socio-economic status and these sentences are used more by higher educated people (Hulstijn 2017). Gifted children in this study do not distinguish themselves on the basis of their procedural memory, but possibly through the beneficial social environment they grow up in.

References

- Hulstijn, J. (2017). Syntactic patterns in the speech of native speakers of Dutch, differing in age and level of education and profession. *Linguistics in Amsterdam*, 10(1), 60-90.
- Lum, J.A.G., Conti-Ramsden, G., Morgan, A.T & M.T. Ullman (2014). Procedural learning deficits in specific language impairment (SLI): a Meta-analysis of serial reaction time task performance. *Cortex*, 51(100), 1-10.
- Steiner, H.H. & M. Carr (2003). Cognitive Development in Gifted Children: Toward a More Precise Understanding of Emerging Differences in Intelligence. *Educational Psychology Review*, 15(3), 215-246.

67 The influence of presentation mode on the vocabulary learning of children with Autism Spectrum Disorders

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Vocabulary knowledge is critical for effective communication and academic success. It is therefore important that we understand the optimal ways to teach, and for children to learn, new vocabulary. This study investigated the influence of presentation mode on the vocabulary acquisition of children with autism spectrum disorders (ASD), and took into consideration language phenotype.

Thirty-five children with ASD (18 with age-appropriate structural language skills [ALN] and 17 with language impairment [ALI]) plus 29 typically developing (TD) peers aged 8-13 were taught 20 low frequency Science words. Half of the stimuli were presented with an explicit definition, whilst the remainder were embedded in a narrative from which the meaning could be inferred. Phonological (naming) and both receptive and expressive semantic knowledge (word-picture matching and definition production) were assessed immediately after learning.

For phonological learning, the ALN group attained higher scores than their ALI peers, whilst the TD group did not differ from either ASD group. There was no effect of condition. On the semantic learning tasks the TD and ALN groups did not differ, but the ALI group acquired less knowledge. On the expressive semantic task, all three groups attained higher scores in the definition relative to context condition.

The results suggest that acquisition of detailed expressive semantic knowledge is boosted by the provision of definitional information for children with ASD and their TD peers. However, children with ALI do not learn new vocabulary as efficiently as their peers, and will likely need additional tuition.

68 It's raining, isn't it? The use of tag questions as a test case for form-function mappings

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Many studies have demonstrated that children acquire specific words and word sequences earlier when they are heard more frequently in the input, and that several factors (including form-function mappings) interact with frequency (Lieven, 2010). However, little is known of exactly how form-function mappings and frequency interact in the acquisition of syntactically and pragmatically complex sentences. In this study, we used tag questions (e.g. that's a nice dress, isn't it?) as a test case for examining whether the frequency of specific formal properties, function or the consistency of form-function mappings in the input could predict tag questions produced by children. Tag questions were extracted from twelve naturalistic corpora of children and their caregivers interacting during play. Tag questions produced by the children and caregivers were coded for pragmatic function, tag form (e.g. isn't it?), and polarity. Tag questions produced by the

children were split into two developmental stages (ds1 and ds2). Mixed effects models revealed that for ds1 and ds2, the frequency of tag questions produced with a tag form, co-occurring with a specific function and polarity predicted the tag questions produced by the children better than the frequency of individual tag forms, function or polarity alone. At ds2, but not at ds1, the frequency of tag questions produced with a particular polarity was also a significant individual predictor of the tag questions children produced. It was concluded that this is evidence supporting the view that children initially acquire complex language by producing specific form-function mappings they hear in the input.

References

Lieven, E. (2010). Input and first language acquisition: evaluating the role of frequency. *Lingua*, 120, 2546-2556

ZONE 5

69 Language proficiency and literacy skills of Russian heritage speakers in Cyprus

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Heritage speakers are bilinguals in home and dominant language, they have more family or cultural motivation and connection to the former, minority or immigrant language, and are more proficient in the latter, society language (Valdes, 2000; Polinsky and Kagan, 2007; Benmamoun et al., 2013; Polinsky, 2015).

The present study is focused on language proficiency and literacy skills of Russian-Cypriot Greek bilingual children, Russian heritage speakers, children of the first generation immigrants living in Cyprus. Their dominant society language is Cypriot Greek, while their home (weak/minority) language is Russian. They have limited exposure to Russian, only at home, and low level of schooling in Russian, only 1-2 hours of Russian lessons per week (Saturday schools).

28 simultaneous bilingual children (Russian-Cypriot Greek), born in Cyprus (father CG and mother Russian) participated in the study. Their age ranges from 4;6 to 11;3, and they attend pre-primary and primary Cypriot Greek school (1st-4th grades), where the language of instruction is Greek.

Both cross-sectional and longitudinal methodology was implemented to investigate developmental trajectory, dominant language transfer, divergent attainment and attrition of Russian heritage speakers in Cyprus (Polinsky, 2006; Polinsky and Kagan, 2007; Montrul, 2008, Benmamoun et al., 2013).

Heritage speakers were measured on their reading and writing skills in Russian every month for a period of one year. Longitudinal data consists of the written corpus of dictations and oral corpus of reading aloud recordings.

It was found that heritage children have better comprehension in both languages, Russian and Greek, than production and were better at reading than writing, comprehension than production. They had both developmental and transfer (from CG) spelling errors in their dictations. There was found a correlation between speech rate, word-per-minute output in reading and spontaneous/elicited speech, and degree of grammatical knowledge, this is in line with Polinsky (2008, 2011).

References

Benmamoun, E., Montrul, S. & Polinsky, M. (2013). Heritage languages and their speakers: Opportunities and challenges for linguistics. *Theoretical Linguistics*, 39, 129-181.

Polinsky, M. (2006). Incomplete acquisition: American Russian. *Journal of Slavic Linguistics*, 14, 191-262.

Polinsky, M. & Kagan, O. (2007). Heritage languages: In the 'wild' and in the classroom. *Language and Linguistics Compass*, 1, 368-95.

70 Patterns of use of adjectives in Catalan from school age to adulthood in different genres and modes of production

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Adjectives, like nouns and verbs, are one of the three major classes of lexical words. But, unlike nouns and verbs, they emerge late in acquisition (Ravid & Levie, 2010). In Catalan, as in many other languages, their use is closely linked to the literate lexicon learned at school-age. The use of adjectives shows a clear developmental pattern from childhood to adulthood (Cordero, 2002; Llauradó & Tolchinsky, 2013). Thus, it can be a good indicator of later language development. The goal of this study is twofold: to characterize the use of adjectives from age nine to adulthood and to examine the

effect of discourse genre (expository and narrative) and mode of production (spoken and written) on frequency of use and word-internal morphological structure. The study takes a corpus-based approach and uses the GRERLI-CAT1 corpus, which contains 316 expository and narrative spoken and written texts produced by 79 Spanish/Catalan bilinguals whose home language is Catalan, at four age and schooling levels (primary school (9- to 10-year-olds), secondary school (12- to 13-year-olds), sixth form (16- to 18-year-olds) and university (adults)). Results show that the use of adjectives expands through school-age and especially from sixth form onwards, presenting an increasing pattern. An effect of genre and mode of production on the target features was also detected. Expository texts contain significantly more adjectives per text and clause and lower-frequency adjectives than narrative texts. Written texts contain significantly more adjectives, and lower-frequency and longer adjectives, than spoken texts. Age interacts with mode of production in the use and morphological complexity of adjectives. The four text types analysed (spoken expository, written expository, spoken narrative and written narrative) present a complexity cline, from written expository texts to spoken narratives through spoken expository texts and written narratives.

References

Cordero, J. A. (2002). L'aprenentatge del català com a segona llengua. Evolució dels aspectes lèxics al llarg de l'escolaritat obligatòria [Learning Catalan as a second language. Lexical aspects development throughout compulsory schooling]. Retrieved from <http://www.winmates.net/mar/estudio/dgpl.php>

Llauradó, A., & Tolchinsky, L. (2013). Growth of text-embedded lexicon in Catalan: From childhood to adolescence. *First Language*, 33, 628-653.

Ravid, D., & Levie, R. (2010). Hebrew adjectives in later language text production. *First Language*, 30, 27-55.

71 Cancelled

72 Repeated reading changes the cognitive load of word learning from shared storybook reading

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Shared storybook reading offers excellent opportunities for children to learn new words. Recent research demonstrates that children learn more new words from hearing stories repeated than from hearing different stories (Wilkinson & Houston-Price, 2013) or one longer story (McLeod & McDade, 2011), even if the number of new words is the same. One possible explanation is that repeating stories reduces cognitive load for children. Children hearing different stories are using their attentional resources to understand each plot and any new characters, but when stories are repeated they are able to allocate some of this attention to other aspects of the story (i.e., new vocabulary). The current study recorded eye-movements as an index of visual attention while children were read either repeated or different stories.

Thirty-six 3-year-old children listened to stories read on a lab computer (for similar method, see Evans & Saint Aubin, 2013). Children either heard one story repeated three times or three different stories. Two novel objects were named incidentally during each story. Importantly, all children encountered target objects and words the same number of times and completed identical test trials. Consistent with a cognitive load explanation, we found differences in looking times and fixations to target objects when stories were repeated. Further analysis showed differences in latencies following novel word onset and in word learning.

Taken together, the findings provide a comprehensive account of how repetition facilitates word learning from storybooks and insight into the attentional mechanisms underpinning variations in word learning from shared storybook readings.

References

- Evans, M., & Saint Aubin, J. (2013). Vocabulary acquisition without adult explanations in repeated shared book reading: An eye movement study. *Journal of Educational Psychology*, 105(3), 596-608.
- McLeod, A. N., & McDade, H. L. (2011). Preschoolers' incidental learning of novel words during storybook reading. *Communication Disorders Quarterly*, 32(4), 256-266.
- Wilkinson, K. S., & Houston-Price, C. (2013). Once upon a time, there was a pulchritudinous princess...: The role of word definitions and multiple story contexts in children's learning of difficult vocabulary. *Applied Psycholinguistics*, 34(3), 591-613.

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Bilingual children are shown to have smaller vocabularies in each language compared to monolinguals (Bialystok, et al., 2010). Furthermore, bilinguals show greater difficulties in accessing expressive vocabulary, even though it remains accessible receptively (Gibson, et al., 2012) "DOI": "10.1017/S1366728910000490", "ISSN": "1366-7289", "note": "PMID: 22247648\nPMCID: PMC3254083", "shortTitle": "The receptive-expressive gap in the vocabulary of young second-language learners", "journalAbbreviation": "Biling (Camb Engl. This disproportion between active and passive vocabulary knowledge is termed 'receptive-expressive gap' (Gibson et al, 2012; Gibson, Peña, & Bedore, 2014) and research shows that in bilingual children, this gap is typically bigger in L1 than in L2.

We tested 99 Polish-English bilingual children aged 4;4-7;0 (M=5;7, SD=0;9) in Polish (L1) and English (L2), using standardized tools for both expressive and receptive vocabulary. We assessed expressive lexicon with a picture naming tasks (EVT-2 for English, ZNO for Polish) and receptive skills with a picture-choice task (BPVS-3 for English, OTS-R for Polish). We then calculated receptive-expressive gap for each participant (in both languages) by subtracting expressive standard scores from receptive standard scores.

We found the expected difference only in Polish (L1) - 55 (55%) of bilinguals demonstrated a meaningful (greater than 10 percentiles) r-e gap in Polish. The average r-e gap in Polish was 15 percentiles. We did not observe the predicted disproportion between receptive and expressive vocabulary skills in English. In fact, the average r-e gap in English was -10 percentiles, which suggests that examined children were relatively more skilled in word production than in word comprehension in English.

In the poster, we search for possible reasons for this outcome. One of them stems from the differences in the characteristics of word stimuli used in the tools (e.g. word frequency of the stimuli included in the two English tools). Also, keeping in mind that the two tests were standardized for two different populations (American and British), we consider variations between those populations that might have affected the results.

73 Is there a receptive - expressive vocabulary gap in Polish-English bilingual children?

References

- Bialystok, E., Luk, G., Peets, K. F., & Yang, S. (2010). Receptive vocabulary differences in monolingual and bilingual children. *Bilingualism* (Cambridge, England), 13(4), 525–531.
- Gibson, T. A., Oller, D. K., Jarmulowicz, L., & Ethington, C. A. (2012). The receptive-expressive gap in the vocabulary of young second-language learners: Robustness and possible mechanisms. *Bilingualism* (Cambridge, England), 15(1), 102–116.
- Gibson, T. A., Peña, E. D., & Bedore, L. M. (2014). The relation between language experience and receptive-expressive semantic gaps in bilingual children. *International Journal of Bilingual Education and Bilingualism*, 17(1), 90–110.

74 Code-switched Prepositional Phrases: Sentence Repetition with English-Hebrew Bilingual Preschool Children

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This study investigates code-switched (CSed) prepositional phrases (PPs) by means of an elicited repetition task in English (L1) – Hebrew (L2), sequential bilingual children (N = 78), ages 5;5 – 6;8. By examining different switching sites within the PP, the study tests competing theories regarding constraints on intra-sentential code-switching, e.g. switching a preposition (Myers-Scotton & Jake, 2009), switching between a preposition and its governed complement (Di Sciullo, Muysken & Singh, 1986) and switching a determiner together with the ensuing noun (Dussias, 2002). Six switch conditions were examined: (1) a CSed preposition (P), (2) a preposition switched together with the following determiner (PD), (3) a preposition switched together with the following determiner and noun (PDN), (4) a CSed noun (N), (5) a noun switched together with the preceding determiner (DN), and (6) no switch. Stimuli consisted of 36 English and 36 Hebrew sentences, matched for semantic content and syntax. English stimuli contained a switch to Hebrew, Hebrew sentences a switch to English. ANOVAs examined the effects of switch sites within the PP and effects of directionality (L1 to L2 versus L2 to L1). Results are in partial support of the CSed P and Government constraints for English Ps. The findings support the constraint on DN switching for both languages. Results also show that children have less difficulty inserting a Hebrew noun into an English sentence than vice versa. The different results for the two languages are discussed in terms of definiteness

marking in English (by a free morpheme) versus Hebrew (a bound morpheme) and the socio-linguistic context of sequential English-Hebrew bilingual children. It is suggested that in addition to universal linguistic constraints, intra-sentential code-switching is contingent on structural features in typologically different languages as well as sociolinguistic factors.

References

- Di Sciullo, A., Muysken P., & Singh, R. (1986). Government and code-mixing. *Journal of Linguistics*, 22, 1-24.
- Dussias, P. E. (2002). On the relationship between comprehension and production data in codeswitching. In C. Wiltshire and J. Camps (Eds.), *Romance phonology and variation* (pp. 27-39). Philadelphia: John Benjamins.
- Myers-Scotton, C. & Jake, J. (2009). A universal model of code-switching and bilingual processing and production. In B. Bullock & A. Toribio (Eds.), *The Cambridge handbook of linguistic code-switching* (pp. 336–357). Cambridge: Cambridge University Press.

75 Assimilating to the adult model: The effect of age, bilingualism, and stereo-typicality of word pairs

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The widely-used free word association task (WAT) revealed that some word pairs are more strongly associated than others for adult native-speakers (e.g., bad-good vs fat-skinny). Vocabulary development in children entails assimilation to how words are associated in an adult model. However, previous studies seldom match children's WAT responses against the exact associates produced by an adult-norm. Little is known about the factors that predict children's rate of assimilation to how words are typically associated in a language community. We examined the extent to which bilingualism and network properties (i.e., stereo-typicality of word pairs) influence children's rate of assimilation to an English monolingual adult model. While children are likely to produce adult-like associates for words that elicit a stereotypical associate (e.g., bad-good), the extent to which this network property interacts with divided language experience is unknown. Twenty-eight English monolinguals, 46 Mandarin-English bilinguals, and 32 Spanish-English bilinguals aged 4 to 7 produced 4, 815 associ-

ates to 15 nouns, verbs, and adjectives. These associates were matched against the University of South Florida Free Association Norms (USF). Children's responses were coded according to whether they were among the top three most typical (TMT) associates in the USF. We targeted the TMT because non-TMT responses declined rapidly in typicality among adults. Adult-like TMT were more likely to be elicited from older children, those whose mother received more years of education, monolingual children, and words that elicit a stereotypical associate. Stereo-typicality of word pairs does not interact with bilingualism. To conclude, our study highlighted that both network properties and learners' characteristics impact children's rate of assimilation to how words associate in a language community. While bilingual children may display a slower rate of assimilation than monolingual children, all three groups exhibited similar influence from stereo-typicality of word pairs.

76 Welsh / English bilingual toddlers have larger total vocabularies than their monolingual peers: The role of language exposure on vocabulary size.

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Research on early bilingual vocabulary development has yielded varying results, depending on vocabulary measures used as well as population-specific characteristics. Studies have found smaller vocabularies in bilingual infants' languages compared to monolingual peers. However, an equal total vocabulary size when both their languages are considered (Hoff, et al. 2012). Many of these studies contain large samples of bilinguals from immigrant populations. As a result, the amount and quality of exposure to the majority language is often inconsistent. When environmental factors such as immigration status and socioeconomic factors are controlled for, bilingual infants have been shown to have equal vocabularies to monolingual peers in each language, and a larger total comprehensive vocabulary (De Houwer et al. 2014). In Wales there is a large population of Welsh/English bilinguals but no adult monolingual speakers of Welsh. As a result children are exposed to English from native speakers across the population. We collected data from over 200 Welsh/English bilingual and English monolingual children, 10-28 months of age, to compare vocabulary development and investigate the role of specific language exposure.

Contrary to previous studies, we found that the bilingual infants had comparable vocabulary sizes to the monolinguals for both comprehension and production. As such, their total vocabulary sizes were significantly larger than the monolinguals'. Amount of exposure to each language was the best predictor of vocabulary size. Although maternal education was correlated with vocabulary size in our sample, socioeconomic status was not.

We conclude that amount of exposure to each language is an important environmental factor to be considered when assessing vocabulary development and developing norms. Further analyses will investigate the types of words that bilingual Welsh/English infants acquire compared to monolingual English peers. Finally we are interested in investigating the role of phonetically identical words in Welsh and English in early bilingual vocabulary development.

References

- De Houwer, A., Bornstein, M. C., & Putnick, D. L. (2014). A bilingual-monolingual comparison of young children's vocabulary size: Evidence from comprehension and production. *Applied Psycholinguistics*, 35, 1189-1211.
- Hoff, E., Core, C., Place, S., Rumiche, R., Senior, M., & Parra, M. (2012). Dual language exposure and early bilingual development. *Journal of Child Language*, 39, 1-27.

77 Verbal working memory and the acquisition of cross-linguistic phonological regularities

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Closely related languages such as Frisian and Dutch share cross-linguistic phonological regularities, which connect a fixed sequence of phonemes in one language to another fixed sequence of phonemes in the other language (Sjölin, 1976). An example is Frisian -ân [ɔ:n] and Dutch -and [ant], as in the cognate pairs hân [hɔ:n] - hand [hant] 'hand' and lân [lɔ:n] - land [lant] 'country'. Within Bybee's network model (2001), these regularities are, just like grammatical rules within a language, generalizations that emerge from schemas of phonologically and semantically related words. Previous research has shown that verbal working memory is related to the acquisition of grammar, but not vocabulary

(e.g. Verhagen & Leseman, 2016). This suggests that it supports the acquisition of linguistic regularities. In order to test this hypothesis we investigated whether verbal working memory is also related to the acquisition of cross-linguistic phonological regularities.

For three consecutive years, 5- to 8-year-old Frisian-Dutch bilingual children (n = 120) were tested annually on verbal working memory and a Frisian receptive vocabulary task that comprised four cognate categories: (1) identical cognates, (2) non-identical cognates that either do or (3) do not exhibit a phonological regularity between Frisian and Dutch, and (4) non-cognates. Non-verbal IQ, SES, exposure to Frisian and verbal short-term memory were statistically controlled.

A mixed models analysis showed that verbal working memory had a significantly stronger effect on cognate category (2) than on cognate category (1), (3) and (4). This confirms the hypothesis that verbal working memory is related to the acquisition of cross-linguistic phonological regularities. More generally, it suggests that verbal working memory plays a role in the acquisition of linguistic regularities.

References

Bybee, J (2001). Phonology and language use. Cambridge, UK: Cambridge University Press.

Sjölin, B. (1976). "Min Frysk": een onderzoek naar het ontstaan van transfer en "code-switching" in gesproken Fries. Groningen: Frysk Ynstitút oan de Ryksuniversiteit.

Verhagen, J., & Leseman, P. (2016). How do verbal short-term memory and working memory relate to the acquisition of vocabulary and grammar? A comparison between first and second language learners. *Journal of experimental child psychology*, 141, 65-82.

78 Text-genre based analysis of the acquisition of L2 writing skills: the example of kitchen recipes

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We analyse writing skills acquired by 11-year-old Basque L2/Spanish L1 students schooled in Basque immersion. The data are contrasted with those of

a Basque L1 group of the same age. Our work focuses on a specific text genre- a kitchen recipe - assuming from a didactic perspective that the teaching of text genre production will foster the acquisition of language use (Dolz & Gagnon, 2010). The writing of recipes implies exploring the difference between primary and secondary genres (Bakhtine, 1982), expected to be more complex in L2.

Students were asked to write pork sandwich recipes for recently arrived 11-year-old immigrant children who wanted to learn to read in Basque and get to know popular Basque food for young people. Some patterns were given: the teacher wrote the ingredients on the blackboard and then explained the elaboration. In accordance with the theoretical principles of the socio-discursive interactionism, the communicative aspects of the activity were clearly specified: the role of recipe writers, the addressee, and the goal of the recipes.

Analysing precise linguistic units such as text organizers, verb tenses, referential and modality expressions, our results show that the students were able to produce the text genre proposed, although with some difficulties both in L1 and L2 when passing from a direct to an indirect communicative situation. Some specific lexical and morpho-syntactical problems were attested in L2.

We may conclude that immersion in Basque contributes to the development of writing skills in L2 similar to L1 by the end of primary education at least as far as the genre here analysed is concerned. These results corroborate other investigations on the linguistic and academic outcome of the Basque educational system: standard evaluations reflect similar or even higher results than in majority language monolingual educational contexts (Cenoz, 2009).

References

Bakhtine, M. (1982). El problema de los géneros discursivos. In *Estética de la creación verbal* (pp.248-290). Mexico: Siglo XX.

Cenoz, J, (2009). Towards Multilingual Education. Basque Educational Research from an International Perspective. Clevedon: Multilingual Matters.

Dolz, J. & Gagnon, R. (2010). El género textual, una herramienta didáctica para desarrollar el lenguaje oral y escrito. *Lenguaje* 2010, 38 (2), 497-527.

79 Profiling language development in dual language learners

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Limited information on typical bilingual language development contributes to difficulty in discerning language impairment in children exposed to two languages (Bedore & Peña, 2008; Kohnert, 2010). To better understand bilingual language development, we asked: do typically-developing bilingual children demonstrate consistent performance across language domains? We predicted that participants would show similar levels of ability across measures of English morphology, syntax and vocabulary.

Participants included 43 children (age=53 months, SD=2.8) exposed to Spanish and English. Data is presently available from informal and formal measures across three language domains in English. Vocabulary: two language sample measures (type-token ratio and number of different words) and a standardized vocabulary measure; morphology: three measures of morpheme emergence/productivity (Hadley & Short, 2005); syntax: two language sample measures (mean length of utterance in words and number of complete and intelligible utterances) and a standardized syntax measure. Phonological analysis is ongoing. Participants were classified as high, mid, low or inconsistent performers based on performance across the three domains. High performers scored above the group average on 2-3 measures in each domain; mid performers scored above average on 1-2 measures in each domain; and low performers scored above average on 0-1 measure in each domain. Those demonstrating any other pattern (e.g., high in vocabulary, low in morphology) were categorized as inconsistent performers.

29 children demonstrated consistently high, mid or low performance; 11 were inconsistent across domains. A two-tailed sign and binomial test revealed that the proportion of consistently-performing children exceeded chance ($p=.03$). Findings suggest that typically-developing children tend to show similar performance across various language skills. Interestingly, both consistent and inconsistent performers had comparable reported Spanish exposure ($M=69.19\%$, $SD=19.66$ and $M=65.17\%$, $SD=22.02$, respectively). Work of this nature has clinical implications and builds a foundation for research on language impairment in bilinguals.

References

Bedore, L. M., & Pena, E. D. (2008). Assessment of bilingual children for identification of language impairment: Current findings and implications for

practice. *International Journal of Bilingual Education and Bilingualism*, 11(1), 1-29.

Hadley, P. A., & Short, H. (2005). The onset of tense marking in children at risk for specific language impairment. *Journal of Speech, Language, and Hearing Research*, 48(6), 1344-1362.

Kohnert, K. (2010). Bilingual children with primary language impairment: Issues, evidence and implications for clinical actions. *Journal of Communication Disorders*, 43(6), 456-473.

80 Language knowledge predicts 3-6 year-old mono- and bilingual children's pronoun processing

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1) "Here are a lion and a dragon. It was the lion that/The lion hugged the dragon near the house. He wanted to sing a beautiful song."

Studies indicate that when listening to sentences like 1), adults assign the pronoun "he" to the subject/first-mentioned referent (lion). English-speaking children 3;0-5;0 also show this effect. However, it is weaker and appears much later in the processing time course than for adults. This study asked whether the development of pronoun processing is predicted by language exposure (mono- vs, bilinguals) or language knowledge (vocabulary scores).

We carried out a visual world study with English monolingual ($N=20$) and English-French bilingual ($N=30$) children, 3;0-6;0. The children listened to mini stories, such as 1), while we monitored their gaze to the characters (e.g., lion, dragon) on the computer screen. Children also completed the Peabody Picture Vocabulary Test.

We calculated the subject advantage (difference in logit looks [subject-object]) for each child in 20ms bins, 200-1700ms after pronoun onset. Generalized Additive Mixed Models allowed us to model the (non-linear) effects of sentence type (cleft, non-cleft) and speaker status (monolingual, bilingual) over time, as well as standardized PPVT scores (results are significant within 99% CI). There was no difference between cleft and non-cleft sentences for the bilinguals, but monolinguals showed significantly more looks to the first-mentioned character approximately 1000-1500ms from pronoun onset

when it was clefted. Furthermore, individual vocabulary scores - not mono- or bi-lingual exposure - significantly predicted the first-mention effect in both groups. Our results indicate the following: Differences in use of clefts as a cue suggest that bilinguals might lag behind monolinguals in their English processing as a group. However, individual children's language knowledge (vocabulary scores) predicts their pronoun resolution performance, i.e., their first-mention preference.

References

Van Rij, J., Wieling, M., Baayen, R. H., & van Rijn, H. (2015). *itsadug: Interpreting Time Series and Auto-correlated Data Using GAMMs*. R package version 2.2. <https://cran.r-project.org/package=itsadug>.

81 Phonological awareness and reading skills in sequential bilingual children

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Background: An important prerequisite for learning to read is the ability to manipulate or make judgments about the phonemic units of spoken words (Hulme & Snowling, 2013). The aim of the current study was to investigate the relationship between phonological awareness and early reading skills in sequential bilingual (SB) children. More specifically, to explore the influence of SB children's first language (L1) phonotactics on their second language (L2) phonological awareness skills, and its relationship with L2 word reading.

Methods: 101 children aged 5;9 – 6;9 years (58 Sylheti-English SB bilinguals, and 43 monolingual English) participated. Phonological awareness was assessed using an English real word phoneme elision task e.g., "say bold without the /b/ sound". To test for the influence of L1 phonotactics, half of the items contained illegal Sylheti phoneme sequences e.g., silk, and the other half contained legal sequences e.g., powder. Reading skills were assessed using the Single Word Reading Test (Foster, 2007).

Results: Mixed model analysis showed a significant interaction between language group and word type ($p < .01$), such that the bilinguals had significantly lower scores for the Sylheti-illegal words than the monolinguals, but there was no difference between the groups for the Sylheti-legal words. There was a significant main effect of group ($p < .001$) and word type ($p < .001$), where overall the bilinguals had lower scores than the monolinguals, with both groups producing most errors for the illegal words. Fur-

ther analysis showed a significant correlation between phonological awareness and word reading. Interestingly, the bilinguals' outcome for illegal phoneme sequences was more strongly correlated with word reading ($r = .60$, $p < .001$) than monolinguals ($r = .33$, $p < .05$), while there were no differences for legal sequences (both $r = .52$, $p < .01$). These results highlight the importance of accounting for language-specific phonology when assessing bilingual children's early literacy skills.

References

Foster, H. (2007) Single Word Reading Test. GL Assessment.

Hulme, C. & Snowling, M. J. (2013) Learning to read: what we know and what we need to understand better. *Child Development Perspectives*, 7 (1), 1-5.

82 Bilingual language assessment: A survey of speech-language therapy caseloads and declared practices in French-speaking Switzerland

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In recent years, the number of multilingual caseloads (Jordaan, 2008) increased for Speech-language therapists (SLTs) working in Western societies. Although the prevalence of language disorders should be equal in bilingual and monolingual children, previous studies revealed evidence for both over or underestimation of language disorders in bilingual children (COST Action IS0804: <http://www.bi-sli.org/>, Kohl et al., 2008). Furthermore, there is an objective challenge for SLTs evaluating bilingual children, in particular a lack of appropriate tools and norms as well as the fact that SLTs often only share one language with their patients (Paradis et al., 2013). Thus, it is important to explore the perceptions and the practices declared by SLTs regarding the evaluation of bilingual children.

This study aims to explore the characteristics and declared practices of SLTs operating in the French-speaking part of Switzerland. To do so, anonymous online questionnaires were sent to SLTs through the local professional association. The response rate was approximately 27%. The 242 SLTs who completed the questionnaire were from different areas, respecting the expected geographical distribution. The questionnaires revealed that 38% of caseloads were bilingual, with higher rates

of bilingual children speaking a great variety of non-national languages in large urban centres. This is similar to general school-age population (Swiss Statistics, 2014). No differences were observed on the nature of the caseloads between bilingual and monolingual children. When asked about their practice, SLTs marginally reported the use of specific assessment for bilingual children (e.g.: testing home languages with or without an interpreter), tending to use the same evaluation strategies for both groups of children (e.g.: standardized tests in French). SLTs also reported a lack of training about bilingualism. Educational and political implications of these results for SLTs and bilingual children will be discussed.

References

Jordaan, H. (2008). Clinical intervention for bilingual children: An international survey. *Folia Phoniatrica et Logopaedica*, 60, 97–105.

Kohl, M., Beauquier-Maccota, B., Bourgeois, M., Clouard, C., Donde, S., & Mosser, A. (2008). Bilinguisme et troubles du langage chez l'enfant : étude rétrospective. *La Psychiatrie de l'Enfant*, 51(2), 577–595.

Paradis, J., Schneider, P., & Duncan, T.S. (2013). Discriminating children with language impairment among English language learners from diverse first language backgrounds. *Journal of Speech, Language and Hearing Research*, 56(3), 971–981.

83 Language Dimensionality in Spanish-English Bilingual Children

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The purpose of the current study was to characterize the relationships across languages and domains on a variety of linguistic tasks for a sample of school-aged Spanish-English (SE) bilingual children. Data for 164 bilingual second and fourth graders were analyzed and included the following measures (in Spanish and English): semantics and morphosyntax subtests of the Bilingual English Spanish Assessment – Middle Extension (BESAME; Peña, Bedore, Iglesias, Gutiérrez-Clellen, Goldstein, in development), the Test of Narrative Language (TNL; Gillam & Pearson, 2004; Gillam, Peña, Bedore, & Pearson, in development), and the Expressive One Word Picture Vocabulary Test (EOWPVT; Brownell, 2000; Brownell 2001). Confirmatory factor analyses (CFA) allowed testing the applicability of hypothesized models of language based on single-language studies

to a bilingual sample. Examination of dimensionality by language in school-age SE bilingual children yielded a 3-factor model (semantics, morphosyntax, and discourse) consistent with prior single-language studies (LARRC, 2015). In addition, cross-linguistic models were tested to examine the underlying structure of language across measures in both Spanish and English. However, findings for models of cross-linguistic dimensionality were inconclusive, with marginal fit across five fit indices. Within-language correlations were stronger than across-language correlations on all domains (Marchman, et al., 2004). It appears that, in mid to upper elementary grades, SE bilingual children may have enough semantic, morphosyntactic, and discourse knowledge across both languages that they may not need to rely on knowledge of the L1 to leverage to L2 (MacWhinney, 2005).

References

Language and Reading Research Consortium (LARRC). (2015a). The dimensionality of language ability in young children. *Child Development*, 86(6), 1948–1965. <http://doi.org/10.1111/cdev.12450>

MacWhinney, B. (2005). Extending the Competition Model. *International Journal of Bilingualism*, 9(1), 69–84. <http://doi.org/10.1177/13670069050090010501>

Marchman, V. A., Martínez-Sussmann, C., & Dale, P. S. (2004). The language-specific nature of grammatical development: evidence from bilingual language learners. *Developmental Science*, 7(2), 212–224.

84 Vocabulary and text quality: lexical development in L1 and L2 discourse

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Vocabulary is essential in language development, and has been found to be a core component of text quality (Malvern, Chipere, & Durán, 2004). Previous studies have shown that lexical frequency, word length, density, diversity, and use of adjectives and nominalizations are good indicators of lexical development in spoken and written language (Llauradó & Tolchinsky, 2013). In the examination of the linguistic correlates of text quality, it is also crucial to consider the constraints imposed by discourse genre and modality at different stages of development. Different ways of conceptualizing vocabulary involve distinct lexical measures that hinder comparisons between previous studies; besides, the

methods employed to investigate the impact of lexical features in text quality differ. Thus, more thorough lexical-specific studies are needed.

We analyzed the above mentioned lexical devices adopting a developmental perspective, and considering the role of discourse genre (narrative vs. expository) and modality of production (spoken vs. written) in L1 and L2 text production. Our sample included 388 texts produced by 67 non-native and 30 native speakers of Spanish, divided into three age groups (9, 12-year-olds, and adults) after watching a silent video on conflict situations at school (Berman & Verhoeven, 2002). Twenty-four judges were asked to rate the quality of texts according to their teaching experience. They were told to consider organization, sentence structure, text cohesion, and vocabulary, and produce a single, global score.

Results show that (1) age has a significant impact on word length, and use of nominalizations and adjectives in L1 and L2 production, while L2 level of competence strongly correlates with lexical density; (2) in the assessment of text quality, features typically associated with analytical writing are appreciated in expository texts (nominalizations) and narrative texts (lexical density). We offer valuable insights into how linguistic features that are associated with text quality change over time.

References

- Berman, R. A., & Verhoeven, L. (2002). Cross-linguistic perspectives on the development of text-production abilities: Speech and writing. *Written Language and Literacy*, 5(1), 1-135. doi:10.1075/wll.5.1.
- Llauradó, A., & Tolchinsky, L. (2013). Growth of text-embedded lexicon in Catalan: from childhood to adolescence. *First Language*, 33(6), 628-653. doi:10.1177/0142723713508861.
- Malvern, D., Richards, B., Chipere, N., & Durán, P. (2004). *Lexical Diversity and Language Development. Quantification and Assessment*. Hampshire: Palgrave MacMillan.

85 Cancelled

86 Children's locative referring expressions in interaction

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Young children learning Spanish use from early

on variable tools to make reference to locations (loc-ref): deictic terms (allá, aquí 'here, there'), directional adverbs (arriba, 'above/up' abajo 'below/down', adentro 'inside/in'), topological constructions ((Prep) NPs: a la escuela, 'to school', en el parque 'in the park'). Besides the specific lexico-grammatical resources of the target language, children have to learn to use them in interaction, where language tools may be recruited in particular conditions, index specific intentions and introduce variable effects (Enfield 2013).

This corpus study (longitudinal data of three children: 2;05-3;03) presents the use of loc-ref expressions in child-adult conversational sequences that attempt to get reference recognition and negotiate agreement on locative targets. In both interactional situations, children may recruit variable loc-ref expressions in particular sequences and dispositions. They insist on their intention and repeat or trade between different loc-ref expressions in negotiating agreement for action locations. They switch deictic expression and directional and topological expressions (Child: allá 'there' - Moth: ¿dónde? 'where?' - Ch: afuera 'outside'), or combine different referring expression in a single conversational turn (allá, abajo, en el cuarto de mamá 'there, downstairs, in Mom's room) to scale the informative import of loc-ref expression to get reference recognition.

The study adds an interactional perspective to former research on locative lexico-grammatical development, and complements previous studies on entity referring expressions (Matthews et al. 2012; Wittek & Tomasello 2005) with children's use of loc-ref expressions. An interactional view to loc-ref expressions ratify children's interactional commitment, and intention to lead the interlocutor to reference recognition, indexing their early calibration of epistemics in conversation (Heritage 2008).

References

- Enfield, N. J. (2013). Reference in conversation. In J. Sidnell, & T. Stivers (Eds.), *The handbook of conversation analysis* (pp. 433-454). Malden, MA: Wiley-Blackwell.
- Heritage, J. (2008). Intersubjectivity and progressivity in references to persons (and places). In T. Stivers & N. J. Enfield (Wds.), *Person reference in interaction: Linguistic, cultural and social perspectives* (pp. 255-280), Cambridge: Cambridge University Press.
- Matthews, D., Butcher, J., Lieven, E. & Tomasello, M. (2012). Two- and Four-Year-Olds Learn to Adapt Referring Expressions to Context: Effects of Distracters and Feedback on Referential Communication. *Topics in Cognitive Science* 4, 184-210
- Wittek, A., & Tomasello, M. (2005). Young children's sensitivity to listener knowledge and perceptual

context in choosing referring expressions. *Applied Psycholinguistics*, 26 (4), 541-558.

87 Pragmatic and linguistic abilities interactions in preschool children: a longitudinal study

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Background: It is proposed that pragmatic skills play an important role during the language development, in particular in social interactions with conversational partners that, for toddlers, are mostly represented from caregivers. Previous studies (Hvastja-Stefani, 2014) have shown that pragmatic abilities are fundamental in the acquisition of the vocabulary and that there is a positive correlation between vocabulary size and communicative acts. Measures of social-conversational abilities, examined in assertiveness and responsiveness behaviours in both children with typical language development and late talkers children, were found as immature in the latter (Bonifacio et al, 2007). Furthermore, longitudinal studies (Smith, 1998) showed that early pragmatic behaviours observed at 10 months predict successive language development. **Objective:** Investigating the relationship between pragmatic and linguistic skills in a longitudinal perspective, assuming that social-conversational abilities at early stages may influence the child's linguistic development.

Method: In a group of 7 Italian children from 26 to 36 months, it was measured the assertiveness and responsiveness of children during the interactions with the adult and the vocabulary size, the M3LU and sentence complexity in three observation times (i.e., 28, 31 and 34 months) with two parental questionnaires (MCArthur CDI and Social-Conversational Skills Rating Scale – Italian version). Individual profiles and communication development trajectories of the children are investigated. Finally, a correlational analysis examined the relation between pragmatic aspects and linguistic abilities.

Results: Analysis showed significant differences in the developmental trajectories of each subject. Comparisons of social-conversational variables with linguistic skills point out positive correlations across the three observation times, in particular variables assertiveness and vocabulary size (T1=.991; T2=.964; T3=.919), assertiveness and M3LU (T1=.955; T2=.964) and responsiveness and M3LU (T1=.893; T2=.954).

Conclusions: Although these outcomes must be taken with prudence, this study confirms the importance of an accurate evaluation for both pragmatic and linguistic skills in early stages of language acquisition.

References

- Bonifacio S., Girolametto L., Bulligan M., Callegari M., Vignola S. and Zocconi E. (2007) Assertive and responsive conversational skills of Italian-speaking late talkers. *Int. J. Lang. Comm. Dis.*, 42(5), 607-623
- Hvastja-Stefani, L. (2014). Lexical and Pragmatic Development of Italian Children During the Second Year of Life: a Longitudinal Study. in: Paolo Bernardis, Carlo Fantoni, Walter Gerbino 102 (eds.) "TSPC2014. Proceedings of the Trieste Symposium on Perception and Cognition, November 27-28", Trieste, EUT Edizioni Università di Trieste, 2014, 111-113.
- Smith L. (1998). Predicting communicative competence at 2 and 3 years from pragmatic skills at 10 months. *International Journal of Language & Communication Disorders*, 33(2), 1998.

88 Typological effects in the early acquisition of possession in Mayan Tzotzil

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Aihkenvald reports that possessive constructions at a cross-linguistic level realize a set of recurrent core meanings: (i) ownership, (ii) whole-part relations (i.e. body parts), and (iii) kinship. Many languages use essentially the same constructions for the core meanings, however, a subset may distinguish between alienable (i.e., ownership) and inalienable (i.e., whole-part relations, kinship) possession. The semantic content varies, and the composition of the classes varies across languages. The notions of what can be possessed and by whom differ widely across cultures. Certain items cannot be owned, but are treated as intrinsically linked to the possessor.

Studies in the acquisition of English have reported that children show an early acquisition of possession with possessive constructions (e.g. 'Mother's sock') and possessive adjectives and pronouns (i.e. 'mine,' 'my') over other forms indicating early acquisition of ownership (Tomasello 1998).

The present study examines the early acquisition of possession in a Mayan language (Tzotzil), which distinguishes between alienable and inalienable possession (de León 2014). Inalienable possession is

obligatorily marked for body-parts, kinship terms, and locative relations. Based on a longitudinal study of two children from single word to multiword utterances (mlu 1.5 to 4) data show that children enter into grammatical possession by a predominant marking of inalienable possession. Early possession is expressed in kinship terms, body parts, and culturally inalienable objects (e.g. 'hen', 'water', 'tortilla'). In contrast to data reported for English acquisition of possession, the Tzotzil acquisition data reveal that children do not express notions of individual ownership at an early age, but rather learn inalienable possession first. This result suggests crosslinguistic and crosscultural differences in the way children enter into notions of possession and ownership.

The study is rooted three decades of linguistic and ethnographic research in the Tzotzil Mayan community of Zinacantan, Chiapas, México.

Aihkenvald, Alexandra 2015. *Possession and ownership*. Oxford: Oxford University Press.

De León, Lourdes 2013. "From roots to edges: First steps into the acquisition of verb morphology in Tzotzil," *Amerindia*. 37 (1). Pp. 302-328.

Tomasello, Michael 1998. "One child's early talk about possession." In Newman, John (ed.) *The Linguistics of Giving*. Amsterdam: John Benjamins.

89 Cancelled

90 On one hand and on the other: Hand position imitation is related to preschool children's language development

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Previous research has shown that infants' motor development is related to language development. Interacting with objects via play may enable infants to see the effect of their actions, thereby increasing sensitivity to the functions of language production during communication (Iverson, 2010). Fine motor skills have been found to predict older children's expressive language production, such as their vocabulary size (Suggate & Stoeger, 2014). In the present study, we explore one possible

reason there might be a link between motor and language skills: conceptualization. Kita (2000) argued that using manual gestures allows speakers to conceptualize what they want to say. We reasoned that children's ability to produce complex hand positions (e.g., the hands in an asymmetric configuration) would be related to their ability to produce language about complex events (such as goal-related language).

We tested these predictions in 4-6 year-old children. To assess fine motor ability, various hand positions (symmetrical and asymmetrical) were imitated. To measure language production, children completed a cartoon-retelling task. We coded for story length and number of achievement verbs, which refer to goal-related actions. The results showed that age had no significant impact on any of the variables under study. Accuracy in imitating hand positions was a significant positive predictor of story length. However, only imitation of asymmetric hand positions was strongly positively correlated with achievement verb frequency. Thus, the retrieval of words reflecting complex events may aid the production of asymmetric actions or vice versa. These results suggest one link between motor and language development in the preschool years is conceptualization: that is, the ability to move the hands asymmetrically allows children to conceptualize complex events (or vice versa). We discuss possible abilities that may underlie the connection between motor and language development in preschool children, particularly imagery abilities.

References

Iverson, J. M. (2010). Developing language in a developing body: The relationship between motor development and language development. *Journal of child language*, 37(2), 229-261.

Kita, S. (2000). How representational gestures help speaking. In D. McNeill (Ed.), *Language and gesture* (pp.162-185). Cambridge, UK: Cambridge University Press.

Suggate, S. P., & Stoeger, H. (2014). Do nimble hands make for nimble lexicons? Fine motor skills predict knowledge of embodied vocabulary items. *First Language*, 34(3), 244-261.

91 Variation in language abilities across children; the role of construction-learning

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Children vary widely in their linguistic ability. While only about 7% are language-impaired, there

is substantial variation within the normal range. Theories of language development must account for this. Chomskyan frameworks propose either deficient competence or processing. By contrast, usage-based approaches view competence and processing as 'two sides of the same coin' (Kidd et al., 2006). Given this interdependence, it is difficult to explain variation. One possibility, consistent with 'adaptationist' accounts (Chang et al., 2012) is that variation reflects differing language-learning abilities. This was investigated using a construction-learning task. We hypothesised that variation in construction-learning would correlate strongly with performance on standardised assessments. Though numerous studies have investigated construction-learning, few have addressed individual variation.

Two unfamiliar constructions were taught to 49 typically-developing children (mean age 5;2) using a storybook context. These were just because + CLAUSE + doesn't mean + CLAUSE, and what makes you think + CLAUSE ? These are syntactically and pragmatically complex and almost non-existent in child-directed speech. Using an unfamiliar construction overcomes confounds inherent in using novel constructions, e.g. overlap with existing constructions, though prior exposure was not controlled. Performance was gauged via elicitation probes, which were coded for errors. Additional tests of receptive and expressive syntax were administered (TROG, and Renfrew Action Picture Test).

There was substantial variation in the ability to acquire the unfamiliar constructions. In addition, construction-learning abilities were strongly associated with receptive syntax ($r = 0.54^{***}$), standardised language scores ($r = 0.54^{***}$), and to a lesser extent expressive syntax ($r = 0.29^*$).

The strong association between construction-learning and performance on standardised assessments supports the adaptationist account. The broad spread of construction-learning suggests this may be an important mechanism driving variation in general language learning ability. Greater difficulties with the just because construction indicate a learning mechanism geared towards non-adjacent items.

References

Kidd, E., Lieven, E., & Tomasello, M. (2006). Examining the role of lexical frequency in the acquisition and processing of sentential complements. *Cognitive Development*, 21(2), 93–107.

Chang, F., Janciauskas, M., & Fitz, H. (2012). Language adaptation and learning: Getting explicit about implicit learning. *Language and Linguistics Compass*, 6(5), 259–278. <https://doi.org/10.1002/lnc3.337>

92 Cancelled

ZONE 1

01 Development of fine motor skills is associated with eventual diagnosis and language in infants at high risk for autism spectrum disorder

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Autism spectrum disorder (ASD) is a developmental disorder characterized by deficits in social communication and repetitive or restricted behaviors [1]. While the hallmarks of ASD are deficits in social communication, a growing body of evidence suggests that fine motor development is also atypical in ASD [2]. However, prior research has traditionally used static measures of fine motor skills to predict later outcomes, without considering whether change over time may better predict outcomes of typically-developing children versus those at high risk for ASD (i.e., siblings of children with ASD; hereafter, "high-risk"). The goal of this longitudinal study was to first examine fine motor skills growth between 6 and 24 months in high-risk and low-risk children, and then to use growth estimates to predict language skills and ASD outcomes at 36 months.

Methods: Children ($n = 155$) were administered the Fine Motor subscale from the Mullen Scales of Early Learning (MSEL) at 6, 12, 18, and 24 months to explore fine motor skills development. At 36 months, children were administered the Expressive Language subscale from the MSEL as a language outcome measure; also, the Autism Diagnostic Observation Schedule (ADOS) was administered to assess ASD diagnoses.

Results: Hierarchical linear modeling analyses revealed slower fine motor growth in infants who were eventually diagnosed with ASD, compared to typically developing infants. Also, infants whose fine motor skills grew at faster rates were less likely to receive an ASD diagnosis and had higher expressive language skills at 36 months. Understanding early fine motor skills development and its relation to later outcomes may allow for the design of effective ASD assessment and intervention.

References

American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Arlington, VA: American Psychiatric Publishing.

LeBarton, E. S., & Iverson, J. M. (2013). Fine motor skill predicts expressive language in infant siblings of children with autism. *Developmental Science*, 16(6). <https://doi.org/10.1111/desc.12069>

02 Comprehension of Pronouns and Non-active Morphology in Cypriot-Greek-Speaking Children with ASD

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It is widely acknowledged that discourse and pragmatics are impaired in children with Autism Spectrum Disorders (ASD) (e.g. Tager-Flusberg et al., 2005). However, little is known about the grammatical abilities of individuals with ASD. Recent studies have reported problems in the interpretation of reflexive pronouns in English (Perovic, Modyanova & Wexler, 2013), in the comprehension and production of clitics and in the comprehension of passives but not of verbs carrying non-active, reflexive morphology in Standard Greek (Terzi et al., 2014). The present study broadens our knowledge regarding the grammatical abilities of children with ASD by examining how Cypriot Greek (CG) children with ASD produce and comprehend pronouns and non-active morphology in the first study on this population. Seven 4;5 to 9;4-year-old high-functioning children with ASD (mean age: 85.7 months) and 17 4;11 to 9;4-year-old typically developing (TD) children (mean age: 81.1 months) matched on age, completed a picture-selection task targeting the comprehension of pronouns (strong, clitic and reflexives) and verbs with non-active morphology (reflexives, passives) (Terzi et al., 2014). We also used an elicitation task targeting enclisis in CG.

Children with ASD showed no significant differences in the interpretation of clitics and strong pronouns from the TD controls. However, younger ASD children were significantly less accurate in the comprehension of reflexives, suggesting a delay in the acquisition of reflexives. No significant differences were found between the two groups in the comprehension of reflexive verbs with passive interpretation or in passive verbs, but the ASD children were significantly less accurate in the comprehension of reflexive verbs. Both groups were less accurate in the comprehension of passives when compared to the reflexive verbs. The findings suggest that there is a delay in the acquisition of reflexivity in the ASD group, and that reflexivity is a vulnerable domain for Cypriot-Greek-speaking children with ASD.

References

- Perovic, A., Modyanova, N., & Wexler, K. (2013). Comprehension of reflexive and personal pronouns in children with autism: A syntactic or pragmatic deficit?. *Applied Psycholinguistics*, 34(04), 813-835.
- Tager-Flusberg, H., Paul, R., & Lord, C. (2005). Language and communication in autism. *Handbook of autism and pervasive developmental disorders*, 1, 335-364.
- Terzi, A., Marinis, T., Kotsopoulou, A., & Francis, K. (2014). Grammatical abilities of Greek-speaking children with autism. *Language Acquisition*, 21(1), 4-44.

03 Statistical Patterns and Rhyme Awareness in Children with Cochlear Implants

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Rhyme awareness is a type of phonological awareness skill essential for children's literacy development. De Cara & Goswami (2003) found that normal hearing (NH) five-year-old children with larger vocabularies were more successful in identifying rhyming words from dense rather than sparse rhyme neighborhoods. In children with cochlear implants (CIs), literacy is a challenging area, and evidence suggests that poor phonological awareness might be a causal factor. Sterne and Goswami (2000) found that children with CIs

rely on orthography to a high degree when making rhyme judgments.

The current study investigates performance in a rhyme oddity task in children with CIs compared with NH peers. Research questions include:

1. Do children with CIs show the same level of accuracy as NH children?
2. Do children with CIs show similar sensitivity to rhyme neighborhood density as NH children? 3. Do vocabulary skills predict accuracy to the same degree in children with CIs and NH?
4. Do orthographic patterns influence performance in children with CIs to a higher degree than in NH children?

Four to eight-year-old children with CIs and age-matched NH children participated in standardized screening for vocabulary, reading skills, nonverbal intelligence, working memory, and general language ability. In the rhyme oddity task, participants listened to 3 words (2 rhyming and 1 non-rhyming) and identified the non-rhyming word. Half of the stimuli come from dense rhyme neighborhoods and half are from sparse neighborhoods. The rhymes are either spelled congruently (feed/need) or incongruently (role/goal).

Predicted results are that children with CIs will demonstrate lower accuracy but their performance will be influenced by neighborhood density and vocabulary skills similarly as in NH children. Results will be discussed in light of current research on phonological awareness skills and literacy development in children with CIs, and the effects of statistical patterns in language learning.

References

- De Cara, B., & Goswami, U. (2003). Phonological neighbourhood density: effects in a rhyme awareness task in five-year-old children. *Journal of Child Language*, 30(3), 695-710.
- Sterne, A., & Goswami, U. (2000). Phonological awareness of syllables, rhymes, and phonemes in deaf children. *Journal of Child Psychology and Psychiatry*, 41(05), 609-625.

04 The role of verb semantics in language production in children with SLI: An eye movements study.

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Native language proficiency in production requires an implicit, detailed understanding of verb semantics. To be able to describe an event, people must scan the visual scene in order to extract sufficient information for the construction of a sequential linguistic formulation. If someone has an entire semantic representation of the verb, when the verb is activated, he also activates its additional elements (arguments) and information regarding filler/gap thematic roles. This facilitates the assortment of useful visual information for the description of the event. In the present work, we intend to explore in greater depth how the knowledge of the verb semantics of the verb influences the perception production of depicted events.

wenty-five children with SLI (age 5;3 - 8;2 years), fifty TD children (3;3 to 8;2 years), and thirty-one normal adults participated in an eye-tracking language production experiment that was designed to investigate how the knowledge of verb semantics affects the perception and production of depicted events. Participants were asked to describe pictures that depicted simple events. Half of the events were in their original or canonical form (i.e. The hunter chases the bear) and the other half in their role-traded or non-canonical form (i.e. The bear chases the hunter). In addition, in half of the trials, the subjects were provided with the spoken verb prior to seeing the pictures. Voice recordings were transcribed and parsed. Onsets and offsets of speech, subject nouns, and object nouns were measured for each picture description in addition to argument omissions. Moreover, eye movements were registered to calculate how often participants looked at the subject and object picture referents for each condition.

Results of language and eye movements show that children with SLI are less accurate when inspecting and describing events suggesting poorer semantic representations.

References

Andreu, L., Sanz-Torrent, M., Guàrdia, J., & MacWhinney, B. (2013). The formulation of argument structure in SLI: An eye movement study. *Clinical Linguistic and Phonetic*, 27(2), 111–133.

Andreu, L., Sanz-Torrent, M., Buil, & MacWhinney, B. (2012). Effect of verb argument structure on picture naming in children with and without specific language impairment (SLI). *International Journal of Communication Disorders*, 47(6), 637–653.

05 Navigation and Cognition: From Complex Populations to Organizational Methods

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Selecting the most suitable augmentative and alternative communication (AAC) system can be a challenging task for clinicians. Previous studies have underlined the impact of cognition (i.e. attention, reasoning, etc.) on the navigational process of a speech-generating device (SGD), and more interestingly, the fact that they can predict navigational success (Robillard, & al., 2013; Wallace, Hux & Beukelman, 2010). However, the role of specific cognitive abilities differs according to the studied population. In fact, no study has examined the cognitive demands associated with navigation among individuals who have complex communication needs (CCN) and use an SGD. The research goal was to identify the cognitive factors that impact navigational success among this clinical population with CCN. This first study had 20 participants with CCN (due to a congenital, neurological or an acquired disorder).

The selection of the proper organization layout of an SGD is also important because it could impact navigational success. To our knowledge, no study has compared organizational methods with cognitive abilities. Therefore, the goal of the second study was to determine whether an SGD should be programmed using a taxonomic or a schematic organization based on the child's cognitive skills. This study examined 209 typically developing children while comparing two organizational methods to their cognitive skills.

For both studies, the Leiter International Performance Scale, Third Edition (Roid et al., 2013) was used to assess cognitive abilities. Navigational skills were assessed using an iPad as an SGD that was programmed with the application Proloquo2Go (AssistiveWare, 2017). For both studies, results revealed an important relationship between cognitive and navigational skills. Results varied depending on the population studied, but sustained attention remained an important factor for all. Finally, attendees will learn why age is not the best predictor when selecting the best organizational layout for young children who need an SGD.

References

AssistiveWare. (2017). Proloquo2go [Mobile application software]. Retrieved from <http://itunes.apple.com/>

Robillard, M., Mayer-Crittenden, C., Roy-Charland, A., Minor-Corriveau, M., & Bélanger, R. (2013). Exploring the impact of cognition on young children's ability to navigate a speech-generating device. *Augmentative and Alternative Communication*, 29(4), 347-359.

Roid, G. H., Miller, L. J., Pomplun, M., & Koch, C. (2013). *Leiter International Performance Scale, Third Edition (Leiter-3)*. Wood Dale, IL: Stoelting Co.

Wallace, S., Hux, K., & Beukelman, D. (2010). Navigation of a dynamic screen AAC interface by survivors of severe traumatic brain injury. *Augmentative and Alternative Communication*, 26, 242-254

06 Executive function in monolingual and bilingual children with specific language impairment

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The present study examines different aspects of executive function (EF) in monolingual and bilingual children with Specific Language Impairment (SLI). Although SLI has been defined as a domain-specific disorder, nonlinguistic deficits have been identified among children with SLI including EF. On the other hand, bilingual children perform significantly better on EF than monolingual children, after controlling for parental socio-economic status. However, few studies have considered multiple EF components and specifically the relationship between hot and cold EF. Deficits in hot and cold executive functions are shown to constitute independent routes to symptoms and may have different developmental outcomes in other developmental disorders. Thus, investigation of EF in monolingual and bilingual children may help to further highlight the disorder-specific executive function profile.

Four groups were compared including 10 children each matched for age and gender. Monolingual children with SLI (MSLI, mean age 9.3 years), bilingual children with SLI (BSLI, mean age 9.3 years), monolingual typically developing children (MTD, mean age: 9.3 years), bilingual typically developing children (BTD, mean age: 9.4 years). Bilingual groups were also matched for language exposure. Tasks with verbal and non-verbal stimuli were administered to children measuring cold EF (i.e. fluency, inhibition, switching, attention, planning, and working-memory) and hot EF.

As regards cold executive functions, results showed that both SLI groups achieved significantly lower scores in verbal and non-verbal inhibition, verbal and non-verbal fluency, planning and attention. In relation to hot executive function it was demonstrated that children with SLI as a group achieved significantly lower scores compared to TD children in the gambling task and had lower emotional control. BSLI children exhibited significantly higher scores compared to MSLI children in letter fluency, attention and emotional control. Any effects of disorder on EF were independent of parents' education status.

Discussion focuses on the utilization of the findings in diagnosis and intervention of SLI.

References

Carlson, S. M., & Meltzoff, A. N. (2008). Bilingual experience and executive functioning in young children. *Developmental Science*, 11, 279-295

Kapa LL, Plante E.(2015). Executive Function in SLI: Recent Advances and Future Directions. *Current Developmental Disorders Reports*, 2, 245-252

Henry, L., Messer, D. J. & Nash, G. (2012). Executive functioning in children with specific language impairment. *Journal Of Child Psychology And Psychiatry*, 53(1), 37-45.

07 Finnish preterm children lag behind their full-term peers in narrative content at the age of 5-6 years. Preliminary findings

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This study examines the narrative language of 17 5-6 -year-old Finnish preterm children and their age and gender matched full-term peers. Preterm children are known to be in a high risk for a variety of developmental problems, such as delayed language development (Ross, Foran, Barbot, Sossin & Perlman, 2016). The objective of this study was to discover whether there are differences in the semantic content the preterm children and their full-term peers produce when telling a story from a wordless picture book *Frog where are you?* (Mayer, 1969). No predetermined theme criteria or grid was used for interpreting the content. Instead, the children's expressions were clustered according to their semantics into content units. The semantics of the expressions again were interpreted by the

choice of words and grammatical structures in their context (Halliday & Matthiessen, 2004). For closer investigation, we pulled the content units produced at least by half of the children (8/17) in each group (i.e. high frequency units) and also the units produced by fewer of the children (5-7/17). According to the results, there were quantitative and qualitative differences between the child groups. The preterm children produced less of the aforementioned units. Especially the mid-section of the story could be considered a differentiating factor between the groups: the preterm children had hardly any high frequency units there. Interestingly, the most high frequency content units in the control children's narratives entailed dangerous or exiting events. The preterm group again displayed no such trend. Thus, we concluded that the preterm children seemed to be lagging behind their peers and manifested a larger scale of variety within their own group than the full-term children did. Moreover, we suggest that the semantic units detected in the full-term children's narratives could possibly be capitalized as a prototype for creating a clinical assessment tool for children's narrative skills in the future.

References

Halliday, M. A. K. & Matthiessen, C. M. I. M. (2004). *An Introduction to Functional Grammar*. 3rd Ed. London: Arnold.

Mayer, M. (1969). *Frog, Where Are You?* New York: Dial Books for Young Readers.

Ross, G.S, Foran, L.M. Barbot, B, Sossin, K. M. & Perlman, J. M. (2016). Using cluster analysis to provide new insights into development of very low birthweight (VLBW) premature infants. *Early Human Development*, 92, 45-49.

08 The prevalence and nature of speech, language and communication needs in long-term unemployed adults

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Around 7% of children and 10% of young people have speech, language and communication difficulties. These difficulties can be long term and pervasive and impact on academic achievement, psychosocial functioning and long term employment prospects (Johnson et al., 2010). Most of the research in this area is with young children, and there is limited research or services for older children and adults with Speech, Language and Communication Needs (SLCN). Research looking at the prevalence of

SLCN in young offenders, found rates of between 66-90% of young offenders with SLCN (Bryan et al., 2007). A small scale study exploring the prevalence of SLCN in the long term unemployed found 88% of long-term unemployed males aged 18 to 24 were language impaired (Elliot, 2011).

Understanding more about the language and communication of the long-term unemployed adult population is important because being able to communicate competently is a key part of securing and sustaining employment.

The study aims to investigate the prevalence and nature of speech, language and communication skills in a group of long term unemployed adults.

The study is cross sectional and uses purposive sampling, recruiting participants from one of the largest providers of employability services in the UK. Data collection is ongoing and approximately 100 participants will have completed a short standardised self-assessment on their language and communication skills.

A significant number of long term unemployed adults report to have difficulties in areas of language and communication. Difficulties in structural and pragmatic aspects of language were noted. Many of these difficulties were not previously identified.

Language and communication difficulties can go undetected in adults, and the long term unemployed appear to be particularly vulnerable. Considering the close links between language and employability, it is important for employability services and government agencies to offer language and communication support to this population.

References

Johnson, C. J., Beitchman, J. H., & Brownlie, E. B. (2010). Twenty-year follow-up of children with and without speech language impairments: Family, educational, occupational, and quality of life outcomes. *American Journal of Speech-Language Pathology*, 19, 51-65.

Bryan K, Freer J, & Furlong C. (2007). Language and communication difficulties in juvenile offenders. *International Journal of Language and Communication Difficulties*, 42, 505-520.

Elliott N (2011). An investigation into the communication skills of long-term unemployed young men. <http://ethos.bl.uk/OrderDetails.do?uin=uk.bl.ethos.553779>.

09 Invisible agency: How do Japanese adults and children use language to retrodict false belief events?

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Retrodiction is defined as explaining past events or states of affair using the information available. When describing unintentional events, English-speaking adults construct an agency for the events, thereby focusing on the people who are involved in the events. However, Japanese-speaking adults tend to focus less on the agency and more on the change-of state in the event (Fausey, Long, Inamori, & Boroditsky, 2010).

To understand why an agency is not constructed by Japanese people, this study examined Japanese-speakers' use of language in the retrodiction of false-belief events, which require the conceptual understanding from the perspective of the agent.

Thirty-two children (Mage = 6.0) and 19 adults (Mage = 21.5) participated in this study. The adults and children were individually shown video clips in a quiet room and asked to describe the event in which the main protagonist experienced a mishap because they were ignorant of the change in the situation. The children were also tested in a separate session to ensure they understood the false-beliefs. All the children understood the false-belief in the unexpected-transfer task.

The participants' linguistic description of the events were transcribed and coded for the initial focus of their retrodiction: agency's mental state or change-of-state. Both adults and children made initial references to the change-of-state significantly more than to an agency ($ps < .01$). They tended to refer to the details about how the situation had changed rather than the belief of the protagonist in the retrodiction of the false-belief event. These results suggest that a Japanese-speaker's tendency to place less focus on the agency than the change-of-state also extend to the retrodiction of false-belief events, even where the reference to the agency is paramount and this pattern may have been established at an early age.

References

Fausey, C. M., Long, B. L., Inamori, A., & Boroditsky, L. (2010). Constructing Agency: The Role of Language. *Frontiers in Psychology*, 1, 162. doi:10.3389/fpsyg.2010.00162

10 Executive Functions and Eye Fixations in Children with Cochlear Implant

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Background: In recent years Cochlear Implant (CI) and the corresponding verbal auditory therapy have provided opportunities for the reestablishment of hearing and language in the hearing impaired. However, the results of implanted children are often highly heterogeneous. Recent studies support the idea that one of the key factors in the rehabilitation process is cognitive skills and especially executive functions (EF). Different studies have analyzed the relationship between hearing loss and performance in tasks that evaluate these functions, finding lower performances in this population related to short-term memory, verbal fluency and inhibition. However, in spatial visual skills, they are more likely to equate performances with their control listeners. With the realization that early hearing deprivation may affect more than hearing, analysis of visual patterns in this population will be critical. Purpose: To characterize the EF of a group of children with IC in the city of Bogotá, establishing their relation with visual fixation patterns and language development, compared to a group of children with normal hearing. Method: A group of 13 children with IC between 6 and 11 years old with their respective control group matched for age and sex participated in the cross-sectional study. The performance of EF was evaluated in two modalities: Pencil and paper and Eye Tracking technology. Results: Children with IC showed a significantly lower performance in tasks of inhibition, mental flexibility and working memory compared to normal hearing pairs. No group differences were found in visual memory. These results were related to the findings in measures of visual fixation patterns. Children with IC tend to stay longer in peripheral visual areas, with a greater number of fixations in this area, which explains a greater cognitive effort and worse executive performance. Children with IC were delayed longer to perform tasks, which is related to longer duration of visual fixations. Conclusions: The results of the present investigation have important implications for early intervention and habilitation after cochlear implantation.

References

Pisoni, D. B., Kronenberger, W. G., Roman, A. S., & Geers, A. E. (2011). Measures of digit span and verbal rehearsal speed in deaf children after more than 10 years of cochlear implantation. *Ear and Hearing*, 32(Suppl. 1), 60S-74S.

11 The effect of labels and associated sounds on object recognition

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There is accumulating evidence showing that infants prefer linguistic (e.g., words) over non-linguistic (e.g., sounds) stimuli, suggesting that from the early stage of language acquisition, words have a privileged status (e.g., Vouloumanos & Werker, 2007; Ferry et al., 2010). Yet, it remains unclear whether verbal (labels) and non-verbal signals (associated sounds) activate conceptual representations in a similar manner. Recently, Lupyan & Thompson-Schill (2012) have shown that adults recognize faster a target image (e.g., cat) when it is primed by a verbal cue, such as a spoken label (the word 'cat'), compared to when it is primed by non-verbal sound (e.g., meowing), indicating that in adults concepts are activated more effectively via verbal compared to non verbal means. The present study aimed to replicate and extend these findings to pre-verbal infants. Nine- and twelve-month-old infants participated in a primed intermodal preferential (IPL) task in which they listened to either a label (e.g., cow) or sound (e.g., mooing) followed by an image containing two objects (e.g., cow – telephone), a target (congruent) and a distracter (incongruent), while their looking times were being recorded. An additional group of adults took part in a behavioural task during which they heard a label or a sound followed by an object on the screen, either matching or not the auditory stimulus. Their task consisted at answering as fast as possible indicating whether the word-image pair matched or not. Preliminary results show that, in line with previous findings, adult participants reacted faster when the object was primed by a label compared to a sound. Upon hearing the auditory stimulus (word vs. sound), the 9-month-old infants looked longer at the target image compared to the distracter in both the label and sound conditions and they were faster in shifting their gaze to the target compared to the distracter in the sound compared to the label condition. On the contrary the 12-month-old infants looked longer at the target image compared to the distracter in the sound condition, but in the label condition they looked longer to the incongruent compared to the congruent object. Twelve-month-old infants were faster in shifting their gaze in the label condition compared to the sound condition, even though we observed no difference between congruent and incongruent images. These findings confirmed that, in adults, conceptual representations are activated more quickly and efficiently by verbal labels as opposed to non-verbal cues, emphasizing the special status of words as referential cues. In infants our

data could indicate a developmental trajectory, with 12-month-olds showing a gaze shift pattern more similar to the reaction time in adults compared to the 9-month-olds.

12 The importance of nonlinguistic variability to early language learning: the case of colour

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Background variability supports learning in multiple domains, for example category learning, generalization and motor development. Recent work suggests that it plays a key role in early language acquisition, however whether variability supports or hinders learning is unclear. For example, speaker variability facilitates early phoneme discrimination (Rost & McMurray, 2009), and visual variability in 3D referents helps toddlers learn nouns (Twomey, Ranson & Horst, 2014). In contrast, storybook studies suggest that variability in visual context impairs learning. Thus, the role of nonlinguistic variability in language acquisition is currently unclear.

According to dynamic systems theory (Thelen & Smith, 1994), language – indeed any behaviour – emerges from an interacting system of components, which includes the learner and the learning environment as well as language itself. When these components interact in a predictable way, the result is a predictable behaviour (e.g., crawling). When components of the system change (e.g., muscle strength), new predictable behaviours emerge (e.g., walking). On this account, small amounts of variability should change the way that components of a system interact, speeding up the emergence of new, stable behaviours (Steven & Dixon, 1999). On this account, nonlinguistic variability during learning should help, not hinder, language acquisition. However, if language is a closed, domain specific system, this environmental variability may hinder learning by distracting the learner from the language input.

To test these contrasting predictions, we taught 2-year-old children three novel nouns in an eyetracked referent selection/retention task, manipulating nonlinguistic variability. First, children were asked to locate the referent of known and novel words (e.g., Can you find the [X]?) in an array of one novel and two familiar items. Children were randomly assigned to one of two conditions in which

stimuli were identical, but with the critical exception that half the children saw objects on a white background (constant condition), and half saw objects on multiple, colored backgrounds (variable condition). Next, at test, children were asked to identify the objects encountered during referent selection from an array of novel objects only. There was no strong evidence for sustained attention to either known or novel targets during referent selection. However, children in the constant condition showed no evidence of retaining novel noun-referent mappings at test. In contrast, children in the variable condition did show evidence of word learning, looking at target objects in response to the label at levels greater than expected by chance on the second block of test trials. Thus, in the current study nonlinguistic variability facilitated language learning.

References

Rost, G. C., & McMurray, B. (2009). Speaker variability augments phonological processing in early word learning. *Developmental Science*, 12(2), 339–349.

Thelen, E., & Smith, L. B. (1994). *A dynamic systems approach to the development of cognition and action*. Cambridge, Mass.: MIT Press.

Twomey, K. E., Ranson, S. L., & Horst, J. S. (2014). That's more like it: Multiple exemplars facilitate word learning. *Infant and Child Development*, 23(2), 105–122. <https://doi.org/10.1002/icd.1824>

13 Understanding negation in Mandarin-Italian bilingual school-aged children

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It is well known that negation is challenging for typically developing children (e.g. Bloom 1970, 1993; Fan 2005), and yet still very little is known about how bilingual children comprehend negative sentences (Schelletter 2000). This study examines how Mandarin-Italian bilingual school-aged children comprehend negative sentences compared with affirmative sentences in two languages.

48 bilingual children (MeanAge = 9;3, SD = 1.17), 18 Italian controls (MA = 9;7, SD = 1.03) and 18 Mandarin controls (MA = 9;7, SD = 1.26) were tested with a truth-value judgment task using E-Prime 2.0. The task was manipulated with Sentence Polarity (affirmative vs. negative) and Truth-value (true vs. false), resulting in four Conditions: True affirmative, False affirmative, True negative and False negative (Hu et

al. 2017). Bilingual children's linguistic proficiency and working memory were measured (Dunn & Dunn 2007; Wechsler 2005).

First, negative sentences were harder to process than affirmative ones in all the groups, and True negatives were significantly more difficult than the other conditions. Second, in Mandarin there was no significant difference between the bilinguals and the Mandarin controls in accuracy (e.g. 74% vs. 72% in True negatives), but the bilinguals were significantly slower than the controls (e.g. 3861 ms vs. 3404 ms in True negatives). Third, in Italian the bilinguals were more accurate than the Italian controls, especially in True negatives (70% vs. 33%), but there was no significant difference in response latency between two groups (e.g. 4336 ms vs. 4128 ms in True negative).

Summarizing, this study reveals an asymmetry between affirmative and negative sentences in comprehension for all the groups, consistent with the two-step simulation hypothesis (Kaup et al. 2005, 2006, 2007). Bilingual children's performance on two languages differs from that of the monolinguals, and that can be explained in terms of their linguistic proficiency and working memory.

References

Hu, Shenai, Vender, Maria, Fiorin, Gaetano, & Delfitto, Denis. (2017). Difficulties in Comprehending Affirmative and Negative Sentences: Evidence from Chinese Children with Reading Difficulties. *Journal of Learning Disabilities*.

Kaup, Barbara, Lüdtke, Jana, & Zwaan, Rolf A. 2006. Processing negated sentences with contradictory predicates: Is a door that is not open mentally closed? *Journal of Pragmatics* 38, 1033–1050.

14 Input and interaction across cultures

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Research suggests a strong link between prelinguistic interaction and communicative development (see Bates, et. al., 1975; Colonessi, et al., 2010). While many studies focus on pointing, there is also evidence that earlier behaviours, namely hold out (i.e. the holding out of an object towards a co-participant) and giving behaviours (HoGs) also have an effect on communicative development. To date

HoGs have not been investigated cross-culturally, therefore we do not know whether these behaviours are universal. The aims of the current project are to investigate whether cultural differences exist in terms of (1) HoG age of emergence and frequency, (2) maternal responsiveness to HoGs, and (3) the relationship between HoGs and communicative development.

45 low-income mothers with 10-month-old infants were recruited in the Manchester area of the UK. The sample consisted of; 15 first-generation Bangladeshi mothers, 15 first-generation Chinese mothers and 15 English mothers. Dyads took part in three monthly visits which consisted of (1) a point eliciting activity involving the mother and infant exploring a decorated room (cf. Liszkowski & Tomasello, 2011) and (2) a HoG eliciting session where dyads played for 20 minutes with two sets of toys. Vocabulary measures were taken at 12 and 18 months using language appropriate MacArthur Communicative Development Inventories. To date we have conducted preliminary analyses on the data and report the following:

Infants in each group produced comparable numbers of HoGs, reaches and points at 10, 11 and 12 months

However frequency of maternal vocalisations and contingent talk displayed group-specific variability

The results to date are indicative of global similarities in infant prelinguistic behaviours between the two groups but cultural differences in terms of maternal linguistic responsiveness.

References

Bates, E., Camaioni, L., & Volterra, V. (1975). The acquisition of performatives prior to speech. *Merrill-Palmer Quarterly*, 21, 205-226.

Colonesi, C., Stams, G., Koster, I., Noom, M. (2010). The relation between pointing and language development: A meta-analysis. *Developmental Review*, 30, 352-366.

Liszkowski, U., & Tomasello, M. (2011). Individual differences in social, cognitive, and morphological aspects of infant pointing. *Cognitive Development*, 26, 16-29.

15 Associations between Language and Social Competence

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Although there is a robust association between children's language ability and social competence (Conti-Ramsden & Botting, 2008; van Daal, Verhoeven, & van Balkom, 2007) who were in their final year of compulsory schooling. The risk of emotional difficulties was assessed using the Moods and Feelings Questionnaire (MFQ) little is known about the relation between these constructs. This longitudinal study examined associations between the use of mental state words, communication connectedness and social competence.

A cohort of children (n=67) were assessed at three age points: 24-30 months, 41-49 months and 52-60 months. Data consisted of standardised tests of language and cognition, spontaneous play-based language samples and parental questionnaires of children's social competence.

Mother's connected communication was associated with children's social development. Mothers who more often referred to their children's utterances, reformulated, elaborated or answered in an appropriate way described their children as being more socially advanced later in development. Other key findings were that children's early expressive vocabulary was found to be a significant predictor of social competence. Additionally, children who used more words to refer to their own and other's mental states were reported to have fewer social difficulties later in development.

In conclusion, the findings of this study support the assumption that the process of becoming socially competent encompasses having words to express oneself effectively. It also adds new findings showing that using words to refer to mental state terms and interacting in an environment which offers connected communication is important for the development of social competence.

References

Conti-Ramsden, G., & Botting, N. (2008). Emotional health in adolescents with and without a history of specific language impairment (SLI). *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, 49(5), 516-25.

van Daal, J., Verhoeven, L., & van Balkom, H. (2007). Behaviour problems in children with language impairment. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, 48(11), 1139-47.

16 Preschoolers' bilingualism and their social-emotional wellbeing: the case of Singapore

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The current study aims to examine the relationship between bilingual children's dual language experience (i.e., language input, language output and vocabulary proficiency) and their socio-emotional wellbeing (SEWB). Data from 805 Singapore bilingual pre-schoolers (ages 4; 1 - 5; 8 years), who are learning English and either Mandarin (n=551), Malay (n=105), or Tamil (n=149) were analysed. A parental questionnaire and standard vocabulary tests were used to assess children's bilingual language environment and vocabulary knowledge. Children's SEWB were evaluated by teachers using the Strengths and Difficulties Questionnaire. A series of variables which might influence SEWB (e.g., gender and nonverbal intelligence) were controlled and mixed-effects models were used to conduct data analysis.

Results demonstrated that children who obtained larger bilingual receptive vocabulary and actively spoke both languages since a younger age had better SEWB. Gender and emotion recognition ability were also found to be significantly related to children's SEWB. Such findings held true across children from different Mother Tongue backgrounds. The confirmed association between bilingual language experience and SEWB indicates this correlation might be relevant to children as young as four years old. This suggests that a good language environment for bilingual children should be promoted not only for the sake of their early language development, but also due to the potential benefits to their SEWB.

17 Two social worlds of childhood: Peer-to-peer vs. mother-child discussions on moral dilemmas

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Already during preschool years, children learn the moral norms of their community (see e.g., Turiel, 1983). Piaget (1965) proposed two distinct but equally important contexts for the acquisition of this social knowledge in children: adult-child interactions, in which the adult teaches the norms and the child remains mainly a passive receiver; and children's peer interactions, in which children actively reason about norms by exchanging proposals and justifications. Justifying a proposal is a complex lin-

guistic and a social skill, which requires children to produce complex sentences (with two clauses) and convince their partners to arrive at the best solution for a problem. Although many studies investigated children's reasoning about moral norms, hardly any studies systematically compared mother-child and peer interactions in this domain (but see Kruger & Tomasello, 1986).

We investigated how 4- and 6-year-olds in peer or mother-child dyads reason about moral dilemmas. We presented the dyads with stories about two characters in a moral dilemma of helping a child or keeping a promise. One character breaks a promise in order to help a child; the other keeps the promise and cannot help the child. Then, dyads distributed five gemstones between these two characters. We found that children produced a higher share of justifications and also produced more spontaneous justifications with peers than with their mothers. Further, children relied on providing factual statements (e.g. "She helped"), whereas mothers tended to produce more (over-)informative justifications, stating the moral norm (e.g. "You should keep your promise"), using a pedagogical style. With 4-year-olds, mothers further elaborated on the moral norms by referring to the emotions of the victim (E.g. "Now she is sad."). We show that already at age 4, children distinguish between their two social worlds.

References

- Kruger, A. C., & Tomasello, M. (1986). Transactive discussions with peers and adults. *Developmental Psychology*, 22(5), 681-685.
- Piaget, J. (1965). *The moral judgment of the child*. New York: Free Press.
- Turiel, E. (1983). *The development of social knowledge: Morality and convention*. Cambridge, UK: Cambridge University Press.

18 Socioeconomic status as an important predictor of narrative competence in monolingual and bilingual four-year olds' frog stories

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Storytelling involves various higher level language and cognitive skills that may develop differently in children as a function of their socioeconomic status (SES): Parents with a higher socioeconomic status (HSES) provide their children with richer language input and more stimulating home environments. Therefore, their children are more likely to show a faster linguistic and cognitive development and more advanced narrative skills than children from lower SES (LSES) backgrounds.

The advantage of HSES is also apparent in a bilingual context. Growing up with a heritage language as L1 can be challenging for narrative development in L2, enhanced literacy practices in L1, as often observed in families with HSES, may have positive effects.

A preferred method for eliciting narratives from young children are picture stories, such as the frog story (Berman/Slobin 1994). Nevertheless, frog story investigations of monolingual and bilingual German-speaking four-year olds from different SES are still almost nonexistent.

We analyzed 50 audio- and video-recorded German frog stories that had been elicited from 50 kindergarten children (aged 4;2 – 4;11) w.r.t. narrative elements and discourse-level reference (Gülzow/Gagarina 2007; Veneziano/Hudelot 2009). 24 children (12 HSES, 12 LSES) were German-speaking monolinguals, 26 children (13 HSES, 13 LSES) were successive bilinguals, speaking Turkish at home and learning German in kindergarten.

Results indicate that SES has an influence on the use of narrative elements in monolingual and bilingual children. In L1 83% HSES children used predominantly or partially narrative elements, while this was true only for 17% LSES children. In L2 46% HSES and 15% LSES children used narrative elements. Concerning reference and co-reference, SES effects were limited to textually (as opposed to grammatically) correct (co)referential elements.

SES deficits show in children's narrative skills, and comparisons with additional test results from the same children suggest that they are even stronger than in grammar.

References

- Berman, R. & Slobin, D. I. (1994). Relating events in a narrative: a crosslinguistic developmental study. Hillsdale, NJ: Erlbaum.
- Gülzow, I., & Gagarina, N. (2007). Noun phrases, pronouns and anaphoric reference in young children's narratives. *ZAS Papers in Linguistics*, 48, 203-223.
- Veneziano, E. & Hudelot, C. (2009). Explaining events in narratives: The impact of scaffolding in 4 to 12 year old children. *Psychology of Language and Communication*, 13, 3-20.

19 Processing dialect variability in middle childhood

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While speech produced in unfamiliar dialects causes processing decrements, adults are very accurate in recognizing words produced in unfamiliar dialects (Floccia, Goslin, Girard, Konopczynski, 2006). Children, on the other hand, perform poorly. Although some word recognition abilities have been observed in younger children when tasks were sufficiently stripped-down (van Heugten, Krieger, & Johnson, 2015), other work has shown that even 4-year-olds fail to recognize familiar words produced in an unfamiliar dialect. Only at 7 years old do children finally succeed (Nathan, Wells, & Donlan, 1998). Little is known about the developmental trajectory of children's accent processing when successful word recognition is achieved. The current study sought to understand how varying levels of dialect familiarity influence this trajectory through middle childhood.

232 monolingual American English-speaking 8- to 11-year-old children from the American Midwest were presented with a two-alternative forced-choice picture-prompted word identification task that included two blocks: a multiple-dialect block, in which talkers were each from a different region, and a single-dialect block, in which talkers were from the same region. Stimuli included word tokens produced by talkers of four American English regional dialects: two familiar dialects; Midland and North, and two unfamiliar dialects; Mid-Atlantic and South. Accuracy and response times were recorded.

Results showed that children were faster to respond to trials in the single-dialect block, and response time decreased with age at a relatively gradual rate. However, response times to the different single-dialect blocks showed stark developmental differences. Whereas improvements in processing were observed before 10 years old in the Midland and North single dialect conditions, improvements in the Mid-Atlantic and South conditions were observed only after 10 years old. These patterns suggest that relative familiarity with dialect not only affects listeners' ability to adapt to variability, but also affects the development of processing speed.

References

- Floccia, C., Goslin, J., Girard, F., & Konopczynski, G. (2006). Does a regional accent perturb speech processing? *Journal of Experimental Psychology: Human Perception and Performance*, 32(5), 1276.
- Nathan, L., Wells, B., & Donlan, C. (1998). Children's comprehension of unfamiliar regional accents: a preliminary investigation. *Journal of Child Psychology and Psychiatry*, 39(3), 343-365.

van Heugten, M., Krieger, D. R., & Johnson, E. K. (2015). The developmental trajectory of toddlers' comprehension of unfamiliar regional accents. *Language Learning and Development*, 11(1), 41-65.

20 An overview of the quality of interactions in Belgian pre-kindergarten classrooms

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Quality of teacher-children interactions during early childhood plays a protective effect on language development, more particularly with the more vulnerable children (Dickinson, 2011). However, the quality of these interactions, especially those supporting language development, is not always optimal (Piasta et al., 2012). It is of great concern in Belgium, where there is a need to prevent, during early childhood, an educational gap that too often depends on the socio-economic status of a child's family (Vandenbroeck, 2015). Supporting the quality of teacher-children interactions in kindergarten may be a way to preventively support language development and educational achievement. But to date, little is known about what children experience in Belgium kindergarten, regarding language development support. The objective of this study is to document the quality of teacher-children interactions, in the second year of nursery school (4-5 years old) in the French-speaking part of Belgium.

Observations take place in 23 classes. The CLASS Pre-K (Classroom Assessment Scoring System®, Pianta et al., 2008) is used for measuring the quality of teacher-children interactions. Trained observers have assessed quality of interactions along three domains: Emotional Support, Classroom Organization and Instructional support including language modeling.

Results have revealed a lower quality in instructional support while showing a medium-high quality in the emotional support and classroom organization. However, scores in the instructional support increase when teachers propose activities deliberately dedicated to language. A more detailed analysis of the observations in 23 classes, in relation with number of children in the classroom and type of proposed activities will be discussed. These results will be interpreted within the particular context of

kindergarten in Belgium. The present study aims at enabling a more global reflection on the modalities that can better support language development in an educational context, more particularly with more vulnerable children.

References

Dickinson, D. K. (2011): Teachers' language practices and academic outcomes of preschool children. *Science*, 333(6045), 964-967.

Pianta, R. C., La Paro, K. M., & Hamre, B. (2008). *Classroom Assessment Scoring System [CLASS] Manuel: Pre-K*. Baltimore, MD (Brookes Publishing).

Piasta, S., Justice, L., Cabell, S., Wiggins, A., Turnbull, K., & Curenton, S. (2012). Impact of professional development on preschool teachers' conversational responsiveness and children's linguistic productivity and complexity. *Early Childhood Research Quarterly*, 27, 387-400.

Vandenbroeck, M. (2015). Participation in ECEC Programs : Equity, Diversity and Educational Disadvantage. In E. Baker, B. McGaw, & P. Peterson (Eds.), *International Encyclopedia of Education*. 3rd Edition. Oxford, Angleterre (Elsevier).

21 On the role of prosody in atypical phonological development: data from European Portuguese

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Production data from children with primary speech sound disorders (SSD) are traditionally described from a linear perspective. However, recent research showed that prosodic complexity is crucial for identifying clinical markers, different pathologies showing different behaviours concerning the prosody-segments interface [1, 2, 3]. Although argued for typically developing Portuguese children, the impact of prosody in the phonological development of Portuguese children with SSD has not yet been studied.

In this study, we describe data gathered through the assessment tool Crosslinguistic Child Phonology Project – European Portuguese (CLCP-EP), developed under the CLCP project (M. Bernhardt/J. Stemberger (University of British Columbia)), and built under a nonlinear perspective; the variables

segmental inventory, syllable constituency, word stress, position within the word, and word length were considered. Preliminary data on the adequacy of CLCP-EP to assess Portuguese children is provided; the focus is the acquisition of /r/ and /l/ in different prosodic contexts by 3 SSD children (C1, 5;5, phonological disorder; C2, 5;11, SLI; C3, 7;5, SLI;); the results are compared with those from 30 typically developing Portuguese children aged 3;0 to 6;0 (PHON (Y. Rose and B. MacWhinney) used for data analysis).

The results show that prosodic variables are crucial for the description of the 3 SSD: a) syllable structure (branching onsets are the most problematic structures; some codas are less problematic than simple onsets); b) word length (accuracy decreased in polysyllabic words). As for word stress and position within the word, correlations with segments in coda and branching onset occur. The results argue for the relevance of a nonlinear approach in the assessment of children with SSD. The data discussion will include a comparison with the results available in the literature on the impact of prosodic constituency in typical and atypical phonological development.

References

- Ferré, S., dos Santos, C. & de Almeida, L. (2015). Potential clinical markers for SLI in bilingual children. *BUCLD 39 Proceedings*, Cascadilla press, 152-164.
- Marshall, C. R., & Van Der Lely, H. K. (2009). Effects of word position and stress on onset cluster production: evidence from typical development, specific language impairment, and dyslexia. *Language*, 85(1), 39-57.
- Marshall, C., Ebbels, S., Harris, J., & Lely, H. (2002). Investigating the impact of prosodic complexity on the speech of children with Specific Language Impairment, 43-66.

22 Patterns of Morphological Error in Neurodevelopmental Disorders: Evidence from Cross-syndrome Comparisons of Williams, Down, and Fragile X Syndromes

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The study of morphological errors observed in neurodevelopmental disorders has often been a source of empirical evidence for contrasting accounts of language acquisition (i.e. modular vs. neuroconstructivist). Conflicting findings may be related to the wide range of methodologies adopted, and to the fact that a significant number of studies have focused in Williams syndrome, without reference to relevant comparison data.

The aim of the present study was to compare the frequency, type and distribution of morphological errors in conversational and narrative corpora from Williams, Down, and Fragile X syndrome populations. The patterns of morphological error were compared to those with typical development in order to assess claims for a selectively preserved grammar (Clahsen & Almazan, 2004) vs. atypical trajectories of development (Thomas & Karmiloff-Smith, 2005). The subjects of the study were divided in three groups of 12 individuals: WS group, DS group, FXS group (children, adolescents, and adults). A group of 12 TD children matched by verbal age was also included. The speech corpora were transcribed and coded with the CHILDES tools, and morphological analysis was conducted with the MOR program (MacWhinney, 2000).

Results show in the syndromes a higher frequency of errors than in the TD group, but with marked differences amongst them (DS very high vs. WS very low rates of error). WS and FXS show a prevalence of substitutions over omissions, as in the TD group, but DS shows an atypical pattern of prevalence of omissions. Additions are less frequent in the syndromes, but not absent as in the TD group. The syndromes share an atypical profile of distribution of errors by parts of speech compared to the TD group, especially in function words and pronouns. These results would be consistent with the claim of an atypical morphological development in neurodevelopmental disorders.

References

Clahsen, H., Ring, M., & Temple, C. M. (2004). Lexical and morphological skills in English-speaking children with Williams syndrome. In S. Bartke & J. Siegmüller (Eds.), *Williams syndrome across languages* (pp. 222-244). Amsterdam: John Benjamins.

MacWhinney, B. (2000). *The CHILDES Project: Tools for Analyzing Talk*. Mahwah, NJ: Lawrence Erlbaum Associates.

Thomas, M. S. C., & Karmiloff-Smith, A. (2005). Can developmental disorders reveal the component parts of the language faculty? *Language Learning and Development*, 1, 65-92.

23 How early language acquisition difficulties affect interpersonal development during adolescence?

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Previous studies have suggested that children with early language acquisition impairments could experience difficulties in later developmental and educational achievements (Leonard, 2015). In this regard, the main developmental skill affected by language difficulties concerns social abilities (Botting & Conti-Ramsden, 2008). On the other hand, social relations and close friendship are key milestones in psychosocial development. Thus, the aim of this paper is to explore the relationship between early language acquisition difficulties and social skills in preadolescence in children with Specific Language Impairment (SLI).

Sixteen children with SLI and their age and classroom pairs ($n = 16$) were followed from age 5 to age 12 and various measures of language form (phonology with AREHA and morphosyntax with TSA) and social skills (BASC; Reynolds & Kamphaus, 1992) were administered. None of the children showed pragmatic difficulties at 5 years of age measured by PLON-R. Independent mean comparisons with t tests and a regression analysis were applied in order to explore the best predictors of social skills during adolescence.

Results showed that children with SLI were evaluated by their teachers as having the lower social skills, leadership, and adaptive skills than their age pairs. Regression analysis showed that phonologi-

cal and morphosyntactic capacities at early age (6-7 years) explained 44% ($R^2 = 0.44$) of the variance in adaptive skills (social skills, leadership and adaptation) in preadolescence, being phonology the most important factor ($R^2 = 0.35$). Therefore, children with low phonological capacities at 5 years of age showed lower values regarding social skills, leadership and adaptation to social situations at 12 years of age.

These results highlight the relevance of formal language acquisition, beyond pragmatics for the adequate establishment of emotional and social development.

References

Botting, N. & Conti-Ramsden, G. (2008). The role of language, social cognition, and social skill in the functional social outcomes of young adolescents with and without a history of SLI. *British Journal of Developmental Psychology*, 26(2), 281-300.

Leonard, L. B. (2015). *Specific Language Impairment* (2n. editio.). Massachusetts: MIT Press (MA).

Reynolds, C. & Kamphaus, R. W. (1992). *Behavior assessment system for children*. Circle Pines: American Guidance Service.

24 Typically Developing vs. Atypically Developing Mandarin-English Bilingual Children's Acquisition of Syntax: A Case Study of Relative Clauses

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To date, few studies have examined Mandarin-English bilingual children's syntactic development, which leads to difficulties in cross-linguistic comparisons in bilinguals and in designing a good language screening tool that distinguishes typical from atypical bilingual language development. This study contributes to our knowledge about Mandarin-English bilingual children's acquisition of syntax, with a special focus on relative clauses. We used a sentence priming task (also dubbed as Cloze Task by Sheng et al. 2016) to examine children's production of English and Mandarin relative clauses. The participants were between four and seven years of age and included 6 children who were at risk (AR) for language impairment and 11 typically developing (TD) matches. Results: Overall, AR bilinguals' performance on relatives in both languages was significantly worse than the TD group's performance. For Mandarin, while TD children performed significantly better on relatives modifying the subjects

than those modifying the objects ($p < .001$), AR children did not show any significant differences. For English, similar to previous studies on monolingual English-speaking children (e.g., Diessel & Tomasello 2000), the TD bilinguals performed significantly better on relatives modifying the objects than relatives modifying the subjects ($p < .05$). However, AR bilinguals did not show any significant differences. In addition, TD bilinguals performed better on relatives with inanimate head nouns than those with animate head nouns ($p < .05$), but AR bilinguals did not show any significant differences. Follow-up analyses will examine error patterns in the two groups to identify specific areas of difficulties in relative clause production. This will inform the design of screening tools to efficiently capture individuals who are at risk for language impairment.

References

Diessel, H., & Tomasello, M. (2000). The development of relative clauses in spontaneous child speech. *Cognitive Linguistics* 11, 131-151.

Sheng, Li, Yang, M., Peña, E., Bedore, L, Li, F., & Du, Y. (2016). Profiles of language impairment in Mandarin-English bilingual children: A pilot study. Poster presented at the Symposium on Research in Child Language Disorders, Madison, WI.

25 Pragmatic Profiles of Williams and Down Syndromes Narratives: Textual Coherence and Evaluative Language

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The linguistic profile of Williams syndrome was first characterized as a relative strength in a context of intellectual disability. Comparisons with Down syndrome showed fractionated and contrasting linguistic profiles: pragmatic abilities were below expectations in WS, and above expectations in DS, both compared to grammatical abilities. Research has focused on textual pragmatic abilities, underscoring the coherence of WS narratives and the use of evaluative devices compared to DS (Reilly, Klima, & Bellugi, 1990). WS narratives have been described as less integrated and more evaluative than those from TD children (Reilly et al., 2004).

The aim of this study was to compare the textual coherence and the use of evaluative language in both

populations. Narratives from TD children were also analysed to assess deviations in WS and DS profiles.

The subjects were divided in four groups: WS (12 children and adolescents), DS (12 children and adolescents), TD3 (12 children aged 3), and TD5 (12 children aged 5), matched by MLU. Narratives were elicited from an episode of Tom & Jerry cartoons and transcribed using the CHILDES tools (MacWhinney, 2000). Coding was based on the PRagmatic Evaluation Protocol (PREP-CORP), including narrative superstructure recall and order (scenes, episodes, and events), as well as evaluative devices expressing internal states, evidentiality, and perspective.

Results show uneven pragmatic profiles both in WS and DS. Although recall was more detailed in WS, coherence (order) was not significantly higher. The DS group showed greater levels of coherence than the TD3 group. The use of evaluative devices was higher in WS, but was similar to the TD5 group. In conclusion, DS shows a profile of relative strength in textual coherence, and both syndromes show profiles according to their grammatical level in evaluative language.

References

MacWhinney, B. (2000). *The CHILDES Project: Tools for Analyzing Talk*. Mahwah, NJ: Lawrence Erlbaum Associates.

Reilly, J., Klima, E.S., & Bellugi, U. (1990). Once more with feeling: Affect and language in atypical populations. *Development and Psychopathology*, 2, 367-391.

Reilly, J. Losh, M., Bellugi, U. & Wulfeck, B. (2004). "Frog, where are you?" Narratives in children with specific language impairment, early focal brain injury and Williams syndrome. *Brain and Language*, 88, 229-247.

26 Neural dynamics of automatic word processing in LI (HeISLI study)

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Children with developmental language impairment (LI) learn new words slower than their typically developing peers (Nation, 2014). There is also some evidence that in comparison to nouns, the verb lexicon development would be better predictor of later language skills (Hadley, Rispoli, & Hsu, 2016). However, the neural underpinnings of lexical processing impairments in LI remain unclear. Here, as part of the Helsinki Longitudinal SLI study (HelSLI), we aimed to elucidate whether non-attended listening modulates event-related potentials (ERPs) for verb, noun, and acoustically similar novel word processing differently in LI and control groups.

20 children with LI and 15 control children aged 3-4 years were presented with existing verb, noun, and novel word conditions in a non-attended (passive) listening setup while they were watching a silent cartoon. We analysed the change in ERP responses to these conditions during one experimental session (10 minutes).

We found that while the novel word condition did not separate LI children from controls, the processing of a real verb differed between the groups. In controls, all the three conditions resulted in more positive neural responses towards the end of the experiment. However, in children with LI the verb condition did not show response enhancement during passive listening session. This suggests that the architecture of neural lexicon, for verbs in particular, is qualitatively different in LI children than in TD children. Thus, importantly, in LI children, the grammatical word class modulates the response dynamics already at the pre-attentive states of language processing.

References

Hadley, P. A., Rispoli, M., & Hsu, N. (2016). Toddlers' Verb Lexicon Diversity and Grammatical Outcomes. *Language, Speech, and Hearing Services in Schools*, 47(1), 44-58.

Nation, K. (2014). Lexical learning and lexical processing in children with developmental language impairments. *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences*, 369(1634), 20120387.

27 Effects of story complexity on mothers' abstract language use during shared reading with preschoolers

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Background: Experimental research suggests that sharing books positively affects preschoolers' oral language and early literacy skills, and that there is an added benefit when caregivers do not simply read the text but engage children in discussions about the story (e.g., Mol, Bus, de Jong, & Smeets, 2008). Other work shows that abstract language such as recalling and explaining events is an important aspect of the input for preschoolers (e.g., Rowe, 2012). Although it is known that factors such as socioeconomic status (SES) and context (e.g., book reading, toy play) affect the quality of the input, little is known about the effect of story complexity during shared reading (Fletcher & Reese, 2005).

Aims: In this study we investigated the effects of story complexity, maternal SES, child age, child language abilities, and child engagement on mothers' abstract language use during shared reading. We hypothesised that each of these variables would positively predict mothers' abstract language use.

Method: Fifty-five mother-child dyads (3;00-4;11 years) from a range of socioeconomic backgrounds participated. In a single session, dyads were videoed sharing a simple book (containing a non-false belief theme) and a complex book (containing a false-belief theme) in a repeated-measures, counterbalanced design. Children's language abilities were measured once. Videos were transcribed and coded for maternal language use (frequency and proportion of abstract utterances) and child engagement.

Results & Discussion: Story complexity influenced maternal language use, with complex stories facilitating more talk, a higher level of abstraction, and a greater proportion of utterances at the highest level of abstraction. Child engagement predicted mothers' abstract language use, whereas maternal SES, child age, and language abilities did not. Implications of the results for theories of language development, and for the design of shared reading interventions, are discussed.

References

Fletcher, K. L. & Reese, E. (2005). Picture book reading with young children: A conceptual framework. *Developmental Review*, 25(1), 64-103.

Mol, S. E., Bus, A. G., de Jong, M. T. & Smeets, D. J. (2008). Added value of dialogic parent-child book readings: A meta-analysis. *Early Education and Development*, 19(1), 7-26.

Rowe, M. L. (2012). A longitudinal investigation of the role of quantity and quality of child-directed speech in vocabulary development. *Child Development*, 83(5), 1762-1774.

28 Preliminary associations between children's need for information and mothers' provision of information in task situations from 1 to 3 years of age

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Children are exposed to and produce questions from a young age (Chouinard, 2007), and parents' questions relate to children's overall language level (Tamis-LeMonda, Shannon, Cabrera, & Lamb, 2004). Research suggests that input contingent on children's nonverbal requests for information is especially beneficial for children's language learning (Wu & Gros-Luis, 2015). Yet, we lack information about how child-caregiver questioning behaviors and responses develop over time, and link to children's task performance. The current study asks: (1) How do mothers support their child's performance at various ages? (2) Do mothers adjust their support based on their children's ability to request information? (3) Do children's requests for information and mothers' provisions of information in response to these requests predict children's task performance? The sample consists of approximately 65 mother-child dyads that were observed in structured task situations (i.e., geometrical puzzle tasks) at 1, 2 and 3 years. Observational data from a subsample (10 dyads and 30 transcripts) were transcribed using CHILDES. We coded mothers' provision of information, children's request for information, and children success on the structured tasks (for the full report, the sample will be increased to $n \sim 65 \times 3$). At 1 year, mothers help their children with task related information all the way to task completion. At 2 years, mothers mostly support children when they struggle, and at 3 years, mostly when they struggle and also ask for help. Furthermore, with age, children increasingly ask more information seeking questions, an increase that is associated with task success or help with failing attempts because it is related to the information that mothers provide. These preliminary findings show that mothers adjust the information they provide to account for their children's communicative abilities and task performance. Mothers initially provide all information their children need but with age they begin to withhold information unless children request it.

References

Chouinard, M. (2007). Children's questions: A mech-

anism for cognitive development. Monographs of the Society for Research in Child Development. Serial No. 286, 72, No. 1.

Tamis-LeMonda, C. S., Shannon, J. D., Cabrera, N. J., & Lamb, M. E. (2004). Fathers and mothers at play with their 2- and 3-year-olds: Contributions to language and cognitive development. *Child Development*, 75 (1), 1806–1820.

Wu, Z. & Gros-Luis, J. (2015). Contingent Labeling after Infants' Pointing Helps Infants Learn Words. The 37th Annual Conference of the Cognitive Science Society, Austin, TX: Cognitive Science Society.

29 The relationship between parental input and children's spontaneous use of adverbial clauses containing after, before, because, and if

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Being able to express and understand complex relationships between events are important communicative skills, and children's acquisition of complex sentences involving adverbial clauses has been studied for several decades now. However, relatively little is known about how children's own production relates to the speech input they are exposed to, even though it has been shown for various linguistic domains that there is a close link between the distributional properties of the input and language development.

Our study investigates the relationship between parental input and children's production of complex sentences in two dense English corpora of parent-child interaction, which cover a period from age 2;00 to 4;11, and from 3;00 to 4;07. From the parents' speech, we extracted all utterances containing after, before, because and if in a period covering six weeks, starting at the children's third birthday ($N = 2384$). From the children's speech, we extracted all utterances containing these words in both corpora ($N = 3293$), and coded these for a number of formal properties.

We found that the relative frequencies of the subordinators and subordinator-clause order combinations in the children's speech resembled distributions in the input (Fig. 1), with clause order being mostly iconic. However, compared to their caregiv-

ers, children tended to talk more about themselves (higher use of 1st person singular). These preliminary findings suggest that children's production is strongly influenced by input frequency, but that children are also using learnt constructions flexibly (e.g., by using different subjects) to communicate effectively. We will present a detailed analysis of the lexical, morphosyntactic, and pragmatic properties of all utterances and how children's production changes over time, and discuss the implications of our findings for a usage-based theory of language acquisition.

Figure 1: Proportions of the four subordinators and clause order in complex sentences in the input and the children's speech.

30 Why it helps to say it again: the beneficial effects of maternal recasting and expansion

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Adult recasting of child utterances has been shown to aid child language development, as most recently supported in a meta-analysis of treatment studies with children in need of intervention (Cleave, et al. 2015). Most reports have involved analysis of small numbers of subject cases. We present an analysis of 31 mother-child pairs, studied longitudinally. We used a corpus of over 4000 utterances gathered during observation of mother-typically developing child interaction at 18 and 24 months of age and tracked an array of recast options. Using the CLAN CHIP analysis routine, we show a striking impact of both maternal imitation and expansion of child attempts at 18 months with outcomes on both spontaneous and standardized test outcomes at 2 years of age. Even after correction for multiple hypothesis testing, maternal imitation of child attempts at 18 months of age was significantly correlated ($p < .002$) with the child's standardized expressive and receptive language test scores, parental report of language progress on the MCDI and productive expressive morphology during language sampling of their children six months later. Maternal expansions showed virtually identical correlations. Thus, maternal imitation and expansion appeared to significantly foster both lexical and grammatical development between children's first and second birthdays. Results are interpreted to suggest an even more important role for adult recasting on child language progress than previously estimated in small individual studies. These findings have

ramifications for parental guidance on how to foster typical child language development, and also inform clinical intervention and parent counseling for children with language impairment or at risk for requiring intervention.

References

Cleave, P. L., Becker, S. D., Curran, M. K., Van Horne, A. J. O., & Fey, M. E. (2015). The efficacy of recasts in language intervention: A systematic review and meta-analysis. *American Journal of Speech-Language Pathology*, 24(2), 237-255.

31 Symbolic Play and Language Acquisition: a Naturalistic Longitudinal Study.

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There is a well-attested empirical relationship between language acquisition and symbolic play (e.g., Bates, 1979; McCune, 2010). However, the underlying nature of this relationship still needs exploration. Here we report on a longitudinal study that examined the play-language relationship, with a specific focus on parent-infant interactions across different play contexts. Fifty-four ($N = 54$) parent-infant dyads were followed between the ages of 18 and 24 months. At 18 and 24 months the dyads participated in a 20 minute play session. During each session, the dyads played with toys facilitating symbolic play for ten minutes, and with toys facilitating functional play for another ten minutes. Play sessions were then coded for conversational turn, vocabulary, and syntax. Parents also completed the McArthur-Bates CDI at 18, 21, and 24 months. During symbolic play, parents were more likely to ask questions which led to greater conversational turns between dyads. During functional play, parents were more likely to use imperatives and declaratives, and fewer conversational turns were observed between dyads. Unique characteristic properties of symbolic and functional play predicted children's language growth 6 months later: the number of conversational turns and the use of questions, which were more common in symbolic play, had a positive impact on children's vocabulary, while the use of declaratives and imperatives, which were more common in functional play, negatively impacted syntactic complexity and vocabulary development. The results suggest that symbolic play provides infants with more opportunities to participate and engage in interactions than functional play, which positively predict children's language growth. Specifically, symbolic play supports

language acquisition because it provides a social and explorative environment in which the parents invite language production.

References

Bates E., B. L. (1979). Cognition and communication from nine to thirteen months: correlational findings. In E. B. Bates, *The emergence of symbols: cognition and communication in infancy*. (pp. 69-140). New York: Academic Press.

McCune, L. (2010). Developing symbolic abilities. In B. Wagoner, *Symbolic transformation: The mind in movement through culture and society* (pp. 173-192). London: Routledge Press.

32 Index-finger pointing at 12 months predicts language skills until the age of 4 years

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Gestures are one of the most important precursors of language acquisition (e.g., Bates, 1976). A meta-analysis by Colonnaesi et al. (2010) revealed that the more children use pointing gestures early in their development the better their language skills are at a later age. Liszkowski and Tomasello (2011) focused in their study about early communicative skills on different hand forms of pointing gestures—pointing with the whole hand vs. pointing with the extended index finger—and found that index-finger pointing but not whole hand pointing is associated with a child's better understanding of others communicative intentions. In a longitudinal study (N = 42) we investigated the importance of the hand form of pointing gestures for language acquisition. Pointing behavior was measured at 12 months during interactions between the children and their primary caregiver. Various language skills including, lexicon and grammar were assessed with standardized tests at the age of 2, 3, and 4 years. Regression analyses demonstrate that beside the socio-economic status of the family the ability to point with the index-finger at 12 months is a strong predictor of language skills until the age of 4 years. For example, 45% of the variance of the performance in a grammar test at 4 years are explained by the use of the index-finger for pointing at 12 months ($\beta = .43$, $p < .01$) and the socio-economic status of the family ($\beta = .47$, $p < .001$). These find-

ings reveal that index-finger pointing at 12 months (in contrast to hand pointing) is not only a milestone in the social-cognitive development (Liszkowski & Tomasello, 2011), but also in language acquisition.

References

Bates, E. (1976). *Language and context: The acquisition of pragmatics*. New York: Academic Press.

Colonnaesi, C., Stams, G. J. J., Koster, I., & Noom, M. J. (2010). The relation between pointing and language development: A meta-analysis. *Developmental Review*, 30, 352-366.

Liszkowski, U., & Tomasello, M. (2011). Individual differences in social, cognitive, and morphological aspects of infant pointing. *Cognitive Development*, 26, 16-29.

33 How many words for 'vélo' do you know? Franco-phone children strongly apply mutual exclusivity

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Children tend to assume that novel words refer to concepts for which they have not yet learned a word. In other words, they avoid exact synonyms, a process known as mutual exclusivity (Markman, 1990). Part of the reason that children tend to avoid synonyms is that many languages have few exact synonyms (Clark, 2003). The purpose of the present study was to compare children's mutual exclusivity in a language that avoids exact synonyms (English) with a language in which there are synonyms (Canadian French). French is spoken by fewer people than English across Canada, a vast geographical region, and is enriched by immigration from around the franco-phone world. As a result, many exact synonyms exist (e.g., a bicycle can be called *vélo*, *bicyclette*, or *bicycle*).

The participants were two groups of unilingual children: francophones living in Quebec and anglophones in Alberta. According to parental report, the children did not hear any language other than French or English (respectively). Four-year old children were asked to choose the picture corresponding to novel words (e.g., "zoteau" in French and "dax" in English) between two pictures: a familiar object (such as a car) and an unfamiliar object (objects that had been shown to be unnameable by adults). The dependent variable was the percentage of choices of the unnameable object (i.e., avoidance of synonyms).

The results showed that the francophones chose the unnameable objects significantly more often ($M = 91\%$) than the anglophones ($M = 75\%$), suggesting that children who speak Canadian French avoid synonyms more than English-speaking children. The francophones' strong avoidance of synonyms held true across items for which they only knew one label vs. multiple labels for the familiar object. Possible reasons to explain francophone children's strong avoidance of novel synonyms (even when they already know synonyms for the object) are discussed.

References

Clark, E. V. (2003) *First Language Acquisition*. Cambridge: Cambridge University Press. Markman, E. M. (1990). Constraints children place on word meanings. *Cognitive Science*, 14, 57-77.

34 Sex differences in word variety in children's books

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Sex differences in child language learning are well-known, with girls outperforming boys on a variety of measures. While some portion of the sex-related differences is likely due to biological factors, input differences between boys and girls are also a potential factor. For instance, reading is known to be correlated with language development (Fletcher & Reese, 2005), and parents in Canada, the UK, and the USA have been shown to spend more time on reading activities with pre-school girls than boys (Baker & Milligan, 2014).

I explore another potential influence of reading on sex differences in language, namely book vocabulary variety. I analyzed the number of types, tokens, and the type/token ratios for a selection of books listed by more than one caregiver in the IBDb (a survey of books being read to children 0-36 months, Hudson Kam & Matthewson, in press) and compared books being read to girls versus boys. There were 56 different books included in the boys' analysis and 55 in the girls'. On average, the books being read to girls had slightly more word types ($g=122.5$ vs. $b=120.9$) and tokens ($g=393.4$ vs. $b=376.5$) than books being read to boys, with the type-token ratios being almost identical for the two sexes ($g=.393$ vs. $b=.39$). However, when I looked at a sample of books that were only reported for girls compared to a sample of books only reported by caregivers of boys, the girls' books ($n=10$) had substantially more types ($g=174.3$ vs. $b=144$) and tokens ($g=541.1$ vs. $b=341.6$), although a lower type-token ratio ($g=.409$ vs. $b=.425$), than those being read only to boys ($n=8$). Thus, girls are not only being read to more, there

are some (small) sex differences in the language contained in the books being read that could also contribute to sex differences in early language learning.

References

Baker, M., & Milligan, K. (2014). Boy-Girl Differences in Parental Time Investments: Evidence from Three Countries. NBER Working Papers 18893. Cambridge, Mass.: NBER. (NBER paper 2013, ms updated in 2014).

Fletcher, K. L., & Reese, E. (2005). Picture book reading with young children: A conceptual framework. *Developmental Review*, 25, 64-103. doi:10.1016/j.dr.2004.08.009

Hudson Kam, C. L., & Matthewson, L. (2016). Introducing the Infant Bookreading Database (IBDb). *Journal of Child Language*. doi:10.1017/S03050009116000490

ZONE 2

35 Towards investigating verb learnability properties in the input of socio-economically diverse children

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A number of input features predict the learnability of different words (including predicates; Braginsky et al., 2016): All else equal, verbs occurring in shorter utterances are acquired earlier. Yet utterance length varies as a function of socio-economic status (Huttenlocher et al., 2002), and likely also depending on a verb's argument structure. We investigated the length of utterances for different types of verbs in speech to socio-economically diverse children.

Argentinean infants ($N = 10$ whose parents had > 14 years education; $N = 10$ whose parents had < 7 years of education) are being followed up longitudinally. Their input was initially recorded at mean age 0; 14 using an unobtrusive recorder carried in a breast pocket for 4 hours, of which the middle 2 have been fully transcribed. Each utterance's register was annotated as being directed to the key or another child (CDS), or not (ADS). Finally, a number of online databases were consulted to classify verbs as having 1-4 obligatory arguments. Initial exploration revealed low frequencies of occurrence of 1- and 4-argument verbs, which were set aside henceforth.

A mixed model declaring word and child identity as random effects, and socioeconomic status (SES), register, and number of obligatory arguments, as fixed effects revealed a large impact of SES (longer for more educated; $\beta = .87$, $SE = .22$) and register (longer in ADS; $\beta = .52$, $SE = .13$), as well as a smaller but significant effect of number of arguments (longer for 3- than 2-argument verbs; $\beta = .31$, $SE = .17$).

Thus, it would be extremely interesting to investigate learning patterns of verbs in the present

longitudinal sample, where length of utterance varies so widely as a function of a number of factors

that can be partially decorrelated across children. In future work, we hope to shed light on these and

other factors involved in acquiring verb argument structure.

References

Braginsky, M., Yurovsky, D., Marchman, V. A., & Frank, M. C. (2016). From uh-oh to tomorrow

Predicting age of acquisition for early words across languages. In Papafragou, A., Grodner, D., Mirman, D. & Trueswell, J. C. (Eds.), *Proceedings of the 38th Annual Conference of the Cognitive Science Society* (pp. 1691–1696). Austin, TX: Cognitive Science Society.

Huttenlocher, J., Vasilyeva, M., Cymerman, E., & Levine, S. (2002). Language input and child syntax. *Cognitive psychology*, 45(3), 337–374.

36 Developmental Trends in the Processing of German Emotion Terms

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The acquisition of emotion terms is a crucial part of later lexical development. However, little is known about how children acquire and process emotion terms. In particular, the influence of valence on emotion word processing during childhood has not been sufficiently investigated. For children between 9 and 12 years of age, a recent study showed high-

er performance for words with a positive emotional valence than for negative words in an emotional categorization task [1]. Research with adult participants also points to an advantage of positive over negative and neutral words in lexical decision and categorization tasks [e.g., 2]. However, valence effects seem to be task-dependent: In lexical decision tasks, positive words were processed faster than negative ones, whereas the opposite pattern was found in an emotional categorization task [3]. Thus, it is still unclear how valence effects are modified by age and task.

We therefore compared accuracy and response times of children and adults (five age groups: 5-, 6-, 9-, 12-year-olds and adults, 24 participants per group) using two experimental tasks: lexical decision (word or pseudoword) and emotional categorization (positive or negative). Stimuli consisted of 48 German emotion terms (24 positive and 24 negative) matched for arousal, concreteness, frequency, age of acquisition, morphological complexity, neighborhood density, and word length. Results from both tasks reveal developmental trends: With increasing age, children responded faster and more correctly. This finding suggests that the emotion vocabulary gradually becomes more stable and differentiated during middle childhood. In addition, the influence of valence varied with age: younger children (6- and 9 year-olds) showed significantly higher performance levels for positive compared to negative emotion terms, whereas 12-year-olds and adults did not. Possible explanations for this age-related “positivity superiority effect” in emotion word processing will be discussed.

References

Sylvester, T., Braun, M., Schmidtke, D., & Jacobs, A. M. (2016). The Berlin Affective Word List for Children (kidBAWL): Exploring Processing of Affective Lexical Semantics in the Visual and Auditory Modalities. *Frontiers in Psychology*, 7(192), 22. doi:10.3389/fpsyg.2016.00969

Goh, W. D., Yap, M. J., Lau, M. C., Ng, Melvin M. R., & Tan, L.-C. (2016). Semantic Richness Effects in Spoken Word Recognition: A Lexical Decision and Semantic Categorization Megastudy. *Frontiers in Psychology*, 7(723), 802. doi:10.3389/fpsyg.2016.00976

Estes, Z., & Verges, M. (2008). Freeze or flee? Negative stimuli elicit selective responding. *Cognition*, 108(2), 557–565. doi:10.1016/j.cognition.2008.03.003

37 Variation in lexical and phonological development by Lebanese-Arabic-speaking children

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This study examines lexical and phonological development by Lebanese-Arabic-speaking children. Lebanese Arabic has been in contact with French and English for several decades, but the resulting impact on the degree of multilingualism in children's language development is understudied. In a rare study on the early expressive vocabulary of Lebanese children, overall vocabulary size of bilingual and monolingual Francophone children was found to be intriguingly larger than that of monolingual Arabophone children [1], but no control for socio-economic status (SES) was applied. Given the suggested link between SES and vocabulary size on the one hand [2] and phonological development and vocabulary advance on the other [3], this study set out to investigate sound and vocabulary acquisition in one 100 Lebanese children aged 1-3 and balanced for sex, religion and SES (parents' occupation and education, housing/environment, nursery attendance). The aim was to look at the relationship between children's emerging phonological system(s) and vocabulary, and to gauge the influence of multilingualism and SES. The children were recruited from Greater Beirut and recorded in half-hour spontaneous interactions with their caretakers. The speech of both children and mothers was transcribed using Phon. An examination of vocabulary size, consonant and vowel inventories, and target-like segment realization was carried out using mothers' input as the reference variety. Multilingualism was evident across all social backgrounds, but French use was higher in children of Christian families and of higher educated mothers. Segment frequency and accuracy shows high correlation with vocabulary size, supporting existing literature on this matter. When words from all three languages are included, age is the strongest predictor for vocabulary size, phonological inventory and segment accuracy. While mother's education and nursery attendance contribute to segment accuracy, this study calls for a closer scrutiny of the presumed effect of SES on the quantity and richness of lexical development.

References

- Zablit, C., & Trudeau, N. (2008). Le vocabulaire chez les jeunes enfants Libanais Arabophones, franco-phones et bilingues. *Glossa*, (103), 36-52.
- Hart, B. & Risley, T. (1995). *Meaningful Differences in the Everyday Experiences of Young American Children*. Baltimore, MD: Brookes Publishing.
- Vihman, M. (2009). Word learning and the origins of phonological systems. In *Language acquisition* (pp. 15-39). Palgrave Macmillan UK.

38 Lexical Development of Hebrew-Speaking Toddlers: Evidence from the Hebrew Web-CDI Norming Study

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Introduction: Lexical development during the second year of life is characterized by great variability, which necessitates data collection from a large sample (Bates et al., 1994). The present study aimed to generate developmental curves for Hebrew-speaking toddlers' comprehension, production, and gesture vocabularies.

Participants: Hebrew-speaking parents of 1,177 healthy monolingual toddlers aged 12-24 months (625 boys; 552 girls).

Procedure: Parents were invited to join a data collection initiative via a website specifically constructed for establishing norms on early lexical development. Parents completed a computerized version of the Hebrew adaptation of the MacArthur-Bates Communicative Development Inventories (MB-CDI), along with a background questionnaire.

Analysis: Data were organized by age in months (from 12-24 months). Percentiles were calculated for the receptive, expressive, and gesture vocabularies. Correlations and statistical significance tests were conducted to explore age and sex differences.

Results: Great variance emerged in comprehension, production, and gesture use in all age groups. The three measures were highly correlated. No significant differences emerged between girls' and boys' receptive vocabularies. Sex differences, in favor of girls, emerged for expressive vocabularies and for rates of gesture use. However, the sex differences were not consistent across all gesture categories. The girls outperformed the boys only in two categories: "First Communicative Gestures" and "Pretending to be a Parent". A closer look at specific items revealed that there are some girl-biased items and some boy-biased items.

Discussion: Our results correspond with earlier findings from research based on much smaller samples of Hebrew-speaking children (Armon-Lotem & Berman, 2003) and large samples of toddlers speaking different languages (Erikson et al., 2012). The significant differences found between girls and boys highlight the importance of generating norms for each linguistic domain separately, while considering sex as a factor in development.

References

Armon-Lotem, S., & Berman, R. A. (2003). The emergence of grammar: Early verbs and beyond. *Journal of Child Language*, 30(4), 845-877.

Bates, E., Marchman, V. A., Thal, D., Fenson, L., Dale, P., Reznick, J. S., Hartung, J. (1994). Developmental and stylistic variation in the composition of early vocabulary. *Journal of Child Language*, 21(1), 85-123.

Eriksson, M., Marschik, P. B., Tulviste, T., Almgren, M., Perez Pereira, M., Wehberg, S., Gallego, C. (2012). Differences between girls and boys in emerging language skills: Evidence from 10 language communities. *British Journal of Developmental Psychology*, 30(2), 326-343.

39 Cancelled

40 Social-emotional problems and competencies in toddlers: Relations to early vocabulary development

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This paper reports the results of an ongoing longitudinal study of social-emotional problems and competencies of toddlers and their relations to early vocabulary development. The participants were 49 native Finnish-speaking healthy children (24 boys and 25 girls). Brief Infant-Toddler Social and Emotional Assessment (BITSEA; Briggs-Gowan & Carter, 2006), which is based on parental reports, was used at the children's age of 18 months. The BITSEA questionnaire consists of 42 items. Altogether 31 items address problematic behaviour in externalizing (e.g. peer aggression), internalizing (e.g. anxiety) and dysregulation (e.g. sleep and eating problems) domains, and also behaviours that may be early markers of autism spectrum disorders. The 11 competence items rate attention, compliance, mastery motivation, prosocial peer relations, empathy, imitation/play, and social relatedness. The Problem Total and Competence Total scores were calculated. The problem items were also analysed further. Vocabulary development was assessed at 24 and 30 months using the Receptive and Expressive One-Word Picture Vocabulary Tests (ROWPVT and EOWPVT; Martin & Brownell, 2010ab). Girls scored considerably

higher in all of the vocabulary measurements, whereas no gender differences were found in the BITSEA. Vocabulary scores at 24 months correlated positively with the corresponding scores at 30 months. With regard to the relations between social-emotional problems and competencies and early vocabulary development, significant negative correlations between social-emotional problems and all of the vocabulary measurements were found. Further analyses indicated that particularly externalizing problems were associated with slower vocabulary development. By contrast, the Competence Total score correlated positively with receptive and expressive vocabulary at 30 months. Given the data available, the causal link between social-emotional and vocabulary development cannot be identified. Nevertheless, the present findings have important clinical implications. Because of a potential risk for consequences in social-emotional functioning, early intervention should be warranted also for children with delay in vocabulary development.

References

Briggs-Gowan, M. J., & Carter, A. S. (2006). Brief Infant Toddler Social Emotional Assessment (BITSEA). San Antonio, TX: Pearson.

Martin, N. A., & Brownell, R. (2010a). Expressive One-Word Picture Vocabulary Test – 4. Novato, CA: ATP Assessments.

Martin, N. A. & Brownell, R. (2010b). Receptive One-Word Picture Vocabulary Test – 4. Novato, CA: ATP Assessments.

41 Linking production to perception – evidence from Swedish toddlers matched for vocabulary size

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This talk reports an eye-tracking experiment designed to examine the link between perception and production in language acquisition. Ten Swedish toddlers (aged 16 to 28 months) were recorded in their home environment for 30 minutes, when their reported vocabulary size on the Swedish CDI was over 100 words. In order to capture the perceptual effects of the child's own production six words from the recording session were individually chosen and tested for each child. Selection was based on three criteria: 1. Stability: No other variants of the word occurred during the recording session. 2. Transfer:

More than one token reflected the same mispronunciation. 3. Imageability: The word refers to an object that is easy to recognize in a photograph.

One week after the recording, in each trial two pictures – one with a familiar, one with an unfamiliar object – were presented together with an auditory stimulus in an eye-tracking experiment. The auditory stimuli consisted of recordings of word forms uttered by a female adult speaker in a child-directed manner. The word forms were designed to meet the following four conditions: The correct word form (Correct); a word form mispronounced in accordance with the child's production during the recording session (CM); a mispronounced word form unlikely to match any child form (AM); a novel word (Novel), in which the unfamiliar object was named. A factorial ANOVA showed a significant interaction between Condition and Object ($F(3,514) = 4.793, p = .003$). The planned contrasts revealed a significant difference in looking time towards the familiar object in Correct ($p < .012$) and CM ($p < .001$). No significant difference was observed between the familiar versus unfamiliar object in Novel and AM. The striking results in the CM condition reveal a closer relationship between production and perceptual abilities in toddlers than has previously been demonstrated.

42 Socio-Emotional Predictors of Early Productive Vocabulary

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We investigated what aspects of parent-infant interactions and infants' individual characteristics are predictive of early vocabulary. Infants securely attached to their caregivers engage more frequently with people around them, encountering a more varied linguistic environment (Ainsworth et al. 1994). These infants also tend to have caregivers who engage in linguistic exchanges with them and interpret their vocalization as meaningful (Meins, 1998). Finally, securely attached infants control their attention/emotion better, spending more energy exploring the environment and learning words instead of regulating their emotions (Bloom, 1993). Therefore, being securely attached, having an attuned parent, as well as having an easy temperament may improve early vocabulary acquisition. The purpose of the present study was to test these predictor variables longitudinally.

Thirty-eight full-term infants and their mothers have been assessed longitudinally to date. Infants' temperament was assessed at 9 months with the

Infant Behaviour Questionnaire. Mother awareness/guidance of infant's behaviour was assessed in a mother-infant free-play interaction at 9 months. Infant-mother attachment at 12 months was assessed with the Attachment Q-set. Finally, infants' productive vocabulary at 18 months was assessed through the *MacArthur-Bates Communicative Inventory*.

We ran correlation analyses to investigate predictors of infants' productive vocabulary. Surprisingly, only infants' negative affect was significantly correlated with productive vocabulary, $r = -.300, p = .049$. Infants displaying lower levels of negative affect might be more likely to instigate adults to interact in more creative ways with them, fostering more opportunities and scenarios for language learning. There were, however, correlations between the predictor variables. Infants' effortful control and parent guidance were both positively related to attachment security. A possible explanation is that infants' might feel safer around caregivers that help them controlling their attention/emotions, fostering a secure relationship.

Future studies should further investigate how infants' emotional states influence adults' behaviours towards them.

References

- Ainsworth, M. D. S., Bell, S. M., & Stayton, D. J. (1974). Infant-mother attachment and social development: "Socialization" as a product of reciprocal responsiveness signals. In M. P. M. Richards (Ed.), *The integration of a child into a social world* (pp. 99-135). London, UK: Cambridge University Press.
- Bloom, L. (1993). *The transition from infancy to language: Acquiring the power of expression*. London, UK: Cambridge University Press.
- Meins, E. (1998). The effects of security of attachment and maternal attribution of meaning on children's linguistic acquisitional style. *Infant Behavior & Development*, 21(2), 237-252.

43 The usefulness of morphological frames for word categorization in Spanish child-directed speech: Evidence from early production

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Grammatical categories (e.g. noun, verb) are the basis from which language learners build syntactic structure. Several studies have examined the role of distributional frames in children's acquisition of grammatical categories in English (e.g. Mintz, 2003), understanding frames as syntactic contexts with two fixed words which respectively appear to the right and to the left of the word to be categorized. However, there is little empirical evidence regarding the type of distributional frames that might be useful for word categorization in languages other than English.

The present study aims at investigating the type of distributional frames that might be useful for the categorization of nouns in Spanish. Crucially, for the purpose of our analyses, the notion of distributional frame will be expanded to morphosyntactic contexts and not pure syntactic co-occurrences. Thus, since Spanish is morphologically richer than English and exhibits a more regular pattern in terms of morphological agreement, we will define frames as contexts which are made up of a determiner to the left of the word to be categorized, and a morphological ending as the element to the right of the intervening word.

For the present study, we first analyzed child-directed speech from two Spanish corpora available from the CHILDES database (MacWhinney, 2000). The main findings reveal that morphological frames in Spanish are extremely effective for the categorization of the nouns that appear in children's input. Thus, a limited set of frames serves to the categorization of nouns in Spanish with a high degree of accuracy. Furthermore, the results of a second analysis of these children's production seem to indicate that children's early words mirror the patterns found in their environment, since the nouns that were more consistently found within morphological frames in child-directed speech tend to correlate with those found in children's production.

References

- López Ornat, S. (1994). *La adquisición de la lengua Española*. Madrid: Siglo XXI.
- MacWhinney, B. (2000). *The CHILDES project: Tools for analyzing talk*. Third Edition. Mahwah, NJ: Lawrence Erlbaum Associates.
- Mintz, T. H. (2003). Frequent frames as a cue for grammatical categories in child directed speech. *Cognition*, 90, 91-117.
- Vila, I. (1990). *Adquisición y desarrollo del lenguaje*. Barcelona: Graó.

44 Self-Repair Timing of Lexical Problems in Children with Primary Language Impairment

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Primary Language Impairment (PLI) in children includes problems across lexicon-grammar, as well as in processing and executive functions. Lexical deficits emerge as difficulties in word learning, lexical access, item recovery, and in establishing semantic relations, or in lexical uses in specific contexts (Sheng & McGregor, 2010).

Self-repairs produced in the course of spontaneous language interaction may open a window to lexical processing. This study focuses on the time children take to produce a lexical self-repair. Research questions include: a) Does the type of lexical items (nouns, verbs, functional words) have an impact upon the time children take to offer a lexical self-repair?; b) Do children with PLI and their controls with typical language development (TLD) take the same time to perform lexical self-repairs?; c) What does time in self-repairs tells about general cognitive processing?.

The study presents the results from the analysis of lexical self-repairs in spontaneous conversation of six Spanish-monolingual Mexican children (three PLI and three TLD, 6;2 to 6;6, M = 6.3). Results show self-repair time depends upon a set of joint variables: type of lexical problem, strategy adopted in solving a repair and presence of repair markers (Dingemanse et al., 2015).

Children with PLI showed a tendency to take longer time intervals in preparing a repair solution (PLI: Mdn = 453 ms, IQR = 717; TLD: Mdn = 400 ms, IQR = 957.5), although their self-repairs focus primarily on simple goals such as the lexical-phonemic structure of words (PLI = 70.37 %; TLD = 29.63 %). This might suggest PLI group need more time in the planning of and accessing a determined solution not only because of the complexity of the problem source involved but due to the difficulties in lexical processing previously reported (Vélez & Schwartz, 2010).

References

- Dingemanse, M., Roberts, S. G., Baranova, J., Blythe, J., Drew, P., Floyd, S., ... Enfield, N. (2015). Universal Principles in the Repair of Communication Problems. *PLOS One*, 10(9), e0136100. <https://doi.org/10.1371/journal.pone.0136100>
- Sheng, L., & McGregor, K. (2010). Lexical-semantic organization in children with specific language impairment. *Journal of Speech, Language, and Hearing Research*, 53(1), 146-159. [https://doi.org/10.1044/1092-4388\(2009/08-0160](https://doi.org/10.1044/1092-4388(2009/08-0160)
- Vélez, M., & Schwartz, R. G. (2010). Spoken word recognition in school-age children with SLI: Semantic, phonological, and repetition priming. *Jour-*

Journal of Speech, Language and Hearing Research, 53(6), 1616–1628. [https://doi.org/10.1044/1092-4388\(2010/09-0042\)](https://doi.org/10.1044/1092-4388(2010/09-0042))

45 Assessing early vocabulary in Southern Min

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Southern Min speakers constitute 75% of the population in Taiwan, about 17 million (Hung, 2013). It is the main language for communication for many preschoolers and elders. The current Southern Min tests all require reading Southern Min with Chinese characters or Roman letters, which are not familiar to preschoolers and even most native Southern Min speaking adults. Therefore, the goal of this study is to establish a standardized vocabulary picture test in Southern Min.

The total of 149 words, which are illustratable and occurred with high frequency in the spontaneous speech of 2-4 year old, were selected from Taiwan Child Language Corpus (Tsay, 2004). A preliminary picture naming test was given to 60 five-year-old participants. Every participant saw 25 pictures and every picture was seen 10 times. The agreement rate is 96.63%. Then, the pictures were grouped into sets of four and ended up with 50 items. The participants were asked to point to one of the four pictures according to the word uttered by the investigator. Two points were given for each correct item and the total score is 100 points. According to a test with 80 participants aged 2-5, the scores increased with age. The reliability is $\alpha = .887$, the mean difficulty (P) is 0.78 and the mean discrimination (D) is 0.51. The results show that children learn nouns better than verbs and adjectives in two and three years old. After three years old, children learn more verbs than nouns and adjective from four years old to five years old. The results also show that the vocabulary size improves with age.

The test could provide an assessment tool for preschooler's vocabulary development in Southern Min for diagnosis language delay or language disorder. It will also make a valuable tool for the research in language acquisition.

References

Hung, Wei-Ren (2013). The Distribution and Regions of Languages in Taiwan. *Language and Linguistics* 14-2, 315-369.

Tsay, Jane (2004). Taiwan Child Language Corpus. Project of Ministry of Science and Technology (NSC 91-2411-H-194-001)

46 Multiple patterns: 3 to 5-year-olds' ability to decline novel nouns in Estonian

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This study probes children's ability to generalise knowledge of nominal morphology in Estonian, a language with fourteen cases in multiple declensions. The complexity for the language learner is in the three 'grammatical' cases (nominative, partitive, genitive), as: (a) multiple declension classes are productive and frequent; (b) classes are not fully predictable from phonology or semantics; (c) some patterns involve stem changes, and affixes exhibit allomorphy (Blevins 2008).

We conducted a sentence completion task with 69 Estonian-speaking children aged 3–5 years, and an adult control group. We used pictures to introduce novel nouns in pragmatically suitable contexts in one of two cases, nominative and allative ('to X'), and elicited genitive and partitive forms, to determine (1) how participants inflect novel nouns, (2) how presentation and target case affect responses, and (3) whether we see developmental differences.

Trials with nouns presented in allative case constituted an unusual task, as nouns are usually learned in nominative. However, this condition was predicted to result in more uniform responses, as allative contains predictive morphological information missing from nominative forms. Genitive case was predicted to be an easier target than partitive, regardless of presentation case, because of greater consistency: it always ends in a vowel in Estonian; partitive may be vowel-final or end in -t/d.

Results showed that presentation case had no significant effect. Target case ($p < .001$) and age ($p = .007$) were significant predictors of accuracy, with an interaction between them ($p = .011$); 5-year-olds were more accurate with the more consistent genitive than partitive formation. Despite low overall accuracy, 3-year-olds used the same predominant patterns as adults. Responses indicate that no single declensional rule underlies generalisation in Estonian (cf Mirkovic et al. 2011). Young children and adults base generalisation on analogy, showing sensitivity to multiple factors involved in noun inflection.

References

- Blevins, J.P. 2008. Declension classes in Estonian. *Linguistica Uralica* XLIV: 241–267.
- Mirkovic, J., Seidenberg, M.S. & Joanisse, M.F. 2011. Rules versus statistics: Insights from a highly inflected language. *Cognitive Science*, 35: 638–681.

lable duration evolution for speech, the number of chewing cycle and the duration of these sequences according to several textures (purees, crackers, solids) for feeding. Moreover, we asked parents to complete questionnaires about eating habits and linguistic skills (MacArthur-Bates Inventories, Trudeau et al., 2008) after each session to compare our experimental data with behavioural measures. Despite great inter-individual differences, preliminary results showed a syllable duration reduction as well as a decrease of chewing cycle number and duration with age. Besides, we found greater differences between temporal patterns for speech and for nutrition between 8 and 14 months which lead us to believe in a movement activity specification according to the age. Finally, results showed a correlation between the mandible temporal patterns and linguistic skills and food behaviour improvements.

References

- MacNeilage, P. F. (1998). The frame/content theory of evolution of speech production. *The Behavioral and Brain Sciences*, 21(4), 499–511; discussion 511–546. <http://doi.org/10.1017/S0140525X98001265>
- Trudeau, N., Aktouf, K., Boudreault, M.-C., & Breault, C. (2008). *Les Inventaires MacArthur-Bates du développement de la communication (IMBCD) Manuel technique et guide de l'utilisateur*
- Wilson, E., & Green, J. (2009). The development of jaw motion for mastication. *Early Human Development*, 85(5), 303–311. <http://doi.org/10.1016/j.earlhumdev.2008.12.003>.The

ZONE 3

47 Speech and feeding development: A longitudinal study on Quebecois French-speaking children between 8 and 14 months.

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Speech production and mastication are two motor activities characterized by rhythmic jaw oscillation which appear and develop throughout the first years of life. During that period, jaw movement plays a crucial role in articulatory as well as in masticatory skills development (MacNeilage, 1998; Wilson & Green, 2009) the two phases of which are subject to continual articulatory modulation. The cycle constitutes the syllable, and the open and closed phases are segments-vowels and consonants, respectively. The fact that segmental serial ordering errors in normal adults obey syllable structure constraints suggests that syllabic “frames” and segmental “content” elements are separately controlled in the speech production process. The frames may derive from cycles of mandibular oscillation present in humans from babbling onset, which are responsible for the open-close alternation. These communication-related frames perhaps first evolved when the ingestion-related cyclicities of mandibular oscillation [associated with mastication [chewing] sucking and licking. The aim of this pilot study was 1. To investigate the evolution of the mandible temporal patterns during nutrition and speech and 2. To determine a correlation between these patterns and the improvement of linguistic skills and food habits evolution. To address this issue, we monthly followed 5 Canadian-French-speaking children between 8 and 14 months of age using audio-video measures. More specifically, we analysed the syl-

48 Comparison of vowel acoustics in children from the Northern and Midland regions of the United States

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The emergence of dialect variation in child language is not a well-understood process. Labov (1964) proposed that the first stage of this process is acquisition of the grammar, when a child learns grammatical rules and begins forming a vocabulary. The second stage is the vernacular, when characteristics of the child's local dialect first emerge between 5 and 12 years of age. The current project examines the development of regional dialect vowel systems in children in the vernacular stage through a comparison of the acoustic properties of vowels produced by children from the Northern and Midland regions of the United States. The Northern dialect is characterized by the Northern Cities Vowel Shift

(NCVS; Jacewicz, Fox, & Salmons, 2011), in which low vowels follow a clockwise rotation; front vowels move back, higher vowels move lower, and so on. The Midland dialect is characterized by a merger of the low-back vowels and fronting of the high-back vowels (Jacewicz et al., 2011). In the current study, color names were elicited from 89 children from these two regions, including 24 4-5 year olds, 22 6-7 year olds, 24 8-9 year olds, and 19 10-11 year olds. The first and second formant frequencies of the vowels in these words are obtained to model each participant's vowel space to reveal the developmental trajectory of dialect-specific vowel production within each region. We predict that the vowel spaces will show clear regional distinctions for even the youngest children, including evidence of the NCVS for Northern children and of the Midland back-vowel shifts for Midland children. Labov (1964) proposed that children in the vernacular stage are cognizant of their peers' social norms, including language patterns. Therefore, we also expect to observe larger regional differences among older children than younger children, reflecting this development in social awareness during the vernacular stage.

References

Jacewicz, E., Fox, R. A., & Salmons, J. (2011). Cross-generational vowel change in American English. *Language Variation and Change*, 23, 45-86.

Labov, W. (1964). Stages in the acquisition of standard English. In R. Shuy (Ed.), *Social dialects and language learning* (pp. 77-104). Champaign, IL: National Council of Teachers of English.

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50 Consonant and vowel processing in 5-, 8-, and 11-month-olds own name recognition: The role of acoustic/phonetic and lexical factors

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In French, both adults and toddlers give more weight to consonantal information during lexical processing, a bias likely to be acquired given cross-linguistic variation (Nazzi et al., 2016). Recent studies on French infants, demonstrating a vowel (V) bias for name recognition at 5 months (Bouchon et al., 2014) and word segmentation at 6 months, but a consonant (C) bias for segmentation at 8 months (Nishibayashi & Nazzi, 2016), further suggest a developing C-bias. Here, we continue investigating how the C-bias develops.

French-learning infants aged 5- ($n = 24$), 8- ($n = 27$), and 11-months ($n = 24$) were tested on their preference for a C- versus V-mispronunciation (1-feature phonetic change) of their name. Looking times were measured across two blocks of four trials each (two C-mispronunciations, two V-mispronunciations). For each infant and consonant/vowel change, the difference in duration, intensity, and spectral distance between correct and mispronounced phonemes was calculated and compared to looking preferences. Vocabulary measures were collected at test for the 8- and 11-month-olds, as well as at 13, 16, and 24 months (collection ongoing).

Five-month-olds listened significantly longer to vowel mispronunciations, 8-month-olds showed no preference for vowel or consonant mispronunciations, and 11-month-olds preferred consonant mispronunciations at the beginning of the experiment. While we cannot unambiguously interpret these results as a V-bias at 5 months and a C-bias at 11 months, a change in preference fits the developmental framework of the C-bias (see Nazzi et al., 2016). Spectral distance between mispronounced and correct vowels modulated looking behavior only in 5--month-olds, suggesting a greater role for acoustic/phonetic factors early in development. Lastly, we found that the distribution of consonants and vowels in individual early lexicons at both 8 and 11 months could support the development of the C-bias. Ongoing analyses analyze implications of C-bias emergence for later language development.

References

Bouchon, C., Floccia, C., Fux, T., Adda-Decker, M., & Nazzi, T. (2015). Call me Alix, not Elix: Vowels are more important than consonants in own-name recognition at 5 months. *Developmental Science*, 18(4), 587-598. doi: 10.1111/desc.12242

Nazzi, T., Poltrock, S., & Von Holzen, K. (2016). The developmental origins of the consonant bias in lexical processing. *Current directions in Psychological Science*, 25(4), 291-296. doi: 10.1177/0963721416655786

Nishibayashi, L.-L., & Nazzi, T. (2016). Vowel then consonant: A bias switch between 6 and 8 months of age in recognizing segmented word forms. *Cognition*, 155, 188-203. doi: 10.1016/j.cognition.2016.07.003

51 Prosodic boundary perception in French: infant data and analysis of acoustic cues

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Prosody has been hypothesized to be useful early on in language acquisition due to its (imperfect) relation to syntactic structure. Indeed, several studies have demonstrated that infants with distinct language backgrounds are able to perceive the different cues marking prosodic boundaries as early as at 6 months of age (e.g. Nazzi et al., 2000), and there is evidence suggesting that infants' sensitivity to prosodic boundaries develops from a general reliance on combined cues to a language-specific cue-weighting in them (e.g. Johnson&Seidl, 2008; Wellmann et al., 2012). However, stimuli-specifics make language-specific differences difficult to interpret. In a close French replication of Wellmann et al. (2012)'s German study, we tested French-learning infants' sensitivity to a major prosodic boundary (after the second name or not of short utterances: [Loulou et Manou][et Nina],[Loulou et Manou et Nina]) coupled with an extensive acoustic analysis of cue weight in the stimuli (paralleled with the German stimuli).

Experiment 1 tested 40 French-learning 6-month-olds' and 40 8-month-olds' ability to distinguish phrases with or without an internal prosodic boundary marked by three cues (pitch change, pre-boundary lengthening and pause). Using HPP, infants were familiarized to French phrases either containing a boundary or not. In a consecutive test phase, infants were exposed to both types of phrases. French-learning 6-month-olds attended longer to with-boundary stimuli ($p=.027$) while 8-month-olds showed a familiarity preference ($p=.034$) (Hunter&Ames, 1988).

Acoustic analyses using a Random Forest Classification (Breiman, 2001) algorithm showed that both pausing and pitch movement are highly important in classifying prosodic boundaries, additionally showing that with-boundary stimuli are acoustically more dynamic than no-boundary stimuli. We conclude that French-learning 8-month-olds display behavior that is interpretable as linguistic dis-

crimination, while 6-month-olds' behavior is more acoustically-based (preference for more dynamic stimuli). We are currently testing French-learning infants' (48/80) ability to discriminate the same phrases without the pause.

References

- Hunter, M. A. and Ames, E. W. (1988). A multifactor model of infant preferences for novel and familiar stimuli. *Advances in infancy research*.
- Johnson, E. K. and Seidl, A. (2008). Clause segmentation by 6-month-old infants: A crosslinguistic perspective. *Infancy*, 13(5):440-455.
- Wellmann, C., Holzgrefe, J., Truckenbrodt, H., Wartenburger, I., and Höhle, B. (2012). How each prosodic boundary cue matters: Evidence from German infants. *Frontiers in Psychology*.

52 The referential chain construction of French-speaking children

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As addressees, children experience reference to entities, not only through each individual mentions but all along referential chains that are built in the ongoing discourse. In this context, categorization, naming, representation are co-constructed and negotiated by participants in dialogue through reformulations and new predications. Whereas this issue has been thoroughly investigated in adult's discourse analysis, studies on child language have only been considered under the perspective of cohesion, on the one side, and of scaffolding strategies on the other side. Yet, the ability to take part in these processes of co-construction and negotiation accounts for children's discursive and pragmatic development. This poster focuses on the evolution of children's contribution to the construction of referential chains in dialogue.

Eight French-speaking children aged between 3;9 and 5;5, were recorded every month over a period of eighteen months. Ten sessions were devoted to joint reading of a picture book between the child and an adult and four to a symbolic play (doll's house) between peers. Referring expressions, for all participants, were coded according to their form and syntactic function, their position in the referential chain (introduction, repetition, reactivation) and the relation to the source (book or interlocutor).

Results indicate that the length and complexity of referential chains tend to increase with children's age. Distance from the first mention grows with age. Older children can also reintroduce a referent

after a topical change. Younger children contribute through pronouns or uptake of their interlocutors' forms. Reformulation and complexification of noun phrases are observed in older children (e.g. possessive phrases and subordinate clauses). In addition, activities influence the roles in the introduction of new referential chains: children have more opportunities to create referential chains in symbolic play than in joint reading. Discussion will deal with a classification of referential strategies by children.

References

Charolles, Michel. (2002). *La référence et les expressions référentielles en français*. Paris: Ophrys.

Hickmann, Maya. (2003). *Children's discourse: person, time and space across languages*. Cambridge: Cambridge University Press.

Karmiloff-Smith, Annette. (1985). Language and cognitive processes from a developmental perspective. *Language and cognitive processes*, 1 (1), 61-85.

53 The relation between linguistic skills and problem behavior in preschoolers

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The high co-occurrence of linguistic and behavior problems in children is well-known: children with language disorders have an increased risk of developing behavioral disorders (e.g. Conti-Ramsden & Botting, 2004) and this risk is already apparent in young children (Yew & O'Kearney, 2013). However, whether linguistic problems can also evoke problem behavior in typically developing (TD) children is unclear. Therefore, the present study aimed to examine whether linguistic skills are related to problem behavior in TD preschoolers.

50 monolingual preschoolers (4-6 years) participated in the study. We studied the influence of linguistic skills on behavior by eliciting 'communication breakdown' at different linguistic levels (phonetic-phonological, lexical-semantic, syntactic and pragmatic) during an interactive tablet game. The type, amount and intensity of children's behavior in response to 'communication breakdown' was coded using a newly developed System for Coding Child Behavior in Interactive Tasks (SCCBIT). We also as-

sessed the children's receptive vocabulary (PPVT-III-NL) to test the validity of the game as a measure of linguistic proficiency.

The PPVT scores correlated significantly with the total score of the game (number of successful communications), $r(50) = .503, p < .001$. There was a significant negative correlation between total score of the game and total intensity of coded externalizing behavior (anger/frustration), $r(50) = -.329, p = .019$. Furthermore, the score on the pragmatic level correlated with both the total amount and intensity of coded externalizing behavior, $r(50) = -.368, p = .009$, $r(50) = -.375, p = .007$.

The results indicate that linguistic skills and problem behavior are related in young TD children. Moreover, the PPVT validates the game as a measure of linguistic ability. Thus, the tablet game is a potentially interesting tool for screening language problems as well as for examining how preschoolers deal with them behaviorally.

References

Conti-Ramsden G., & Botting N. (2004). Social difficulties and victimization in children with SLI at 11 years of age. *Journal of Speech Language and Hearing Research*, 47(1), 145-161.

Yew, S., & O'Kearney, R. (2013). Emotional and behavioural outcomes later in childhood and adolescence for children with specific language impairments: meta-analyses of controlled prospective studies. *Journal of Child Psychology and Psychiatry*, 54(5), 516-524.

54 Communicative and non-communicative utterances in infants: study of some formal properties

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Infants, since very early in life, employ different behaviors (vocal and gestural) to communicate. Recent studies, focusing on the form and function of pre-speech communicative vocal activities ['CVA'] establish their relationship with subsequent language development. However, infants engage in vocal activities in private/non-communicative situations too. In order to understand the role these non-communicative vocal activities ['NCVA'] play in language acquisition, they should be depicted first. Thus, the aim of this study is to characterize and compare these utterances in the first stages of language acquisition.

With a dense cross-sectional sampling, twenty

ty-eight infants between ages 10 to 23 months were grouped according to their expressive vocabulary level (0-9words; 10-49words; 50+words) and video-recorded for 30minutes in everyday situations. 4,793 vocalizations were segmented and coded according to a variety of variables: formal, functional and gestural.

Our initial hypothesis was that 'CVA' could exhibit a more elaborated form, due to the pressure of the necessity of being understood, or a potential priming effect that adult speech may exercise on infants' vocalizations.

Study 1 tested this hypothesis by comparing various formal properties (i.e.: articulatory quality, type of sound) of 'NCVA' vs. 'CVA'. Results of Chi-square tests did not fully support our hypothesis: 'NCVA' exhibited more 'advanced' or 'speech-like' qualities in the group of infants that barely produce their first words. On the other hand, when infants show an expressive vocabulary of more than 10 words, CVA tends to be more adult-like.

Study 2 addressed the possible explanations for these developmental changes in the NCVA-CVA differentiation. This time, when applying a Configurational Frequency Analysis, results indicate that when taking the pragmatic function and gestural activity into account, CVA are not uniform across functions: (proto)declaratives are more adult-like already in the first stages. Results are discussed in terms of language practice and current theories about language development and gestures.

tion had to correct, the puppet's sentences. For example, one target contained four red hats and four blue boots. The puppet was asked, "Quels objets sont rouges?" ('Which objects are red?') In the Comprehension condition, the puppet replied: "Certains chapeaux sont rouges" ('Some hats are red'). In the Production condition, the puppet produced "certains" but also the wrong noun phrase: "Certaines bottes sont rouges" ('Some boots are red'), prompting corrections rather than simple "no"-responses; participants could correct the noun (e.g., "bottes" to "chapeaux"), or also the quantity determiner ("certain(e)s" to "tou(te)s"). Comprehension: Children (n=17, M= 4;06) were significantly more accepting of implicature targets than adults (n=20) (Mann-Whitney U=68, p<.001), replicating previous results. Production: Responses were recoded as universal (correcting "certains" to "tous") or non-universal corrections (reproducing "certains" or some other non-universal determiner). Children (n=17, M=4;11) produced a significantly lower proportion of universal corrections than adults (n=20) (X²(1)=28, p<.001). Assuming universal corrections correspond to implicature computation, production mirrors comprehension in the two groups. Moreover, the Comprehension and Production results are consistent with accounts that locate children's difficulties with implicatures in accessing alternatives (Barner et al. 2011); without access to "tous", children would neither compute implicatures nor correct "certains" to "tous". Despite the lack of universal corrections, however, children did not merely reproduce "certains"; 60/68 responses corresponded to plural definite descriptions, suggesting that although children may accept underinformative descriptions, they are nevertheless sensitive to their infelicity (Katsos & Bishop 2011).

References

Barner, D., Brooks, N., & Bale, A. (2011). Accessing the unsaid: the role of scalar alternatives in children's pragmatic inferences. *Cognition* 118(1), 84-93.

Katsos, N., & Bishop, D.V.M. (2011). Pragmatic tolerance: Implications for the acquisition of informativeness and implicature. *Cognition* 120(1), 67-81.

Noveck, I. (2001). When children are more logical than adults: experimental investigations of scalar implicatures. *Cognition* 78(8), 165-188.

Papafragou, A., & Musolino, J. (2003). Scalar implicatures: experiments at the semantics-pragmatics interface. *Cognition* 86(3), 253-282.

ZONE 4

55 Children's scalar implicatures: comparing comprehension and production

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The sentence "Some of the hats are red" typically implicates that "Not all of the hats are red." Studies using comprehension tasks have revealed that children often accept weak (e.g., "some") descriptions in strong (e.g., "all") contexts (Noveck 2001, Papafragou & Musolino 2003, among many others). The present study compared comprehension and production of the French scalar quantifier "certains" ('some'), using a judgment task and elicited production paradigm. Participants were introduced to a silly puppet, who described a series of objects. Participants in the Comprehension condition had to judge, while participants in the Production condi-

56 Relevance Inferencing in 3-year-olds: Real World Knowledge Matters

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A core aspect of language acquisition is the ability to infer a speaker's communicative intent. This is especially clear in cases where children need to understand a conversational relevance implicature at the utterance level, for example, when they need to infer that the response (B) below means 'I would prefer toast'.

A: Do you want cereal or toast?

B: The milk's all gone.

In the present study children watched video clips of puppets. For each item, a puppet indirectly expressed which of two objects he or she wanted (as in B above) and children were required to infer the intended referent (e.g. cereal vs. toast). To date we have tested 26 English-speaking children between 3;5 and 3;11.

We asked whether relevance inferencing related to real world knowledge ('Information' sub-test of the WPPSI) and / or to performance on a Theory of Mind scale (which combined Wellman and Liu's, 2004, scale with Hughes and Ensor's, 2005, 'penny-hiding' task). Multiple regression analyses revealed that children's real world knowledge contributed unique variance to their ability to compute relevance inferences, controlling for age and language ability (assessed via the CELF 'Sentence Structure' sub-test). No relationship was found between ToM and relevance inferencing.

Since ecological validity is particularly problematic for experimental measures of pragmatics, we investigated whether our relevance inferencing measure would relate to parental ratings of the child's conversational ability. There was a significant relationship with the Mindful Conversational Ability Scale (MCAS, Peterson, Garnett, Kelly & Attwood, 2009), leading to the conclusion that the relevance inferencing task taps into real life skills.

Whilst data collection is still ongoing, our study is the first to show that real world general knowledge is a critical bottleneck in the ability of children to understand conversational relevance implicatures. The socio-cognitive underpinnings of relevance inferencing require further investigation.

References

Hughes, C., & Ensor, R. (2005). Executive function and theory of mind in 2 year olds: A family affair?. *Developmental neuropsychology*, 28(2), 645-668.

Peterson, C. C., Garnett, M., Kelly, A., & Attwood, T. (2009). Everyday social and conversation applications of theory-of-mind understanding by children with autism-spectrum disorders or typical development. *European child & adolescent psychiatry*, 18(2), 105-115.

Wellman, H. M., & Liu, D. (2004). Scaling of theory-of-mind tasks. *Child development*, 75(2), 523-541.

57 Identifying pragmatic triggers for multi-word expressions in children with complex developmental delays

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The goal of this study was to identify the features of language use which indicate that preschool children with complex multi-system developmental disabilities are ready to respond to therapy aimed at encouraging productive word combining. Participants were the parents of 69 children aged between 2;0 and 6;7 whose language delay was identified both through clinical assessment and through their parents' completion of an ABASII (Harrison, Oakland, & Corporation, 2000). All the children were attending the same multi-disciplinary family-centered early intervention programme in New Zealand. Language development was assessed using the Language Use Inventory (LUI) (O'Neill, 2009) and the New Zealand version of the MacArthur-Bates CDI (Reese & Read, 2000). Outcome measures for word combining presented here are parents' responses to word combining questions on these two measures.

A linear mixed effects model and a procedure employing untrained statistical classifiers were applied to parent responses. Results suggested that (1) vocabulary size is a poor indicator of word combining readiness; (2) pragmatic development as measured by the LUI is a significant predictor of word combining; (3) a baseline of pragmatic development, specifically children's emerging ability to talk about things, themselves and others, is a pre-requisite for word combining; (4) vocabulary size is relevant only once that baseline has been reached; and (5) at that baseline, vocabularies need to be significantly larger to predict word combining than suggested in the literature. Given the relationships between the LUI and the CDI with respect to vocabulary development, it is also suggested that the LUI alone can

serve to indicate readiness for clinical interventions for word combining. The importance of helping both parents and clinicians understand the relationships between pragmatic and lexical development and the nature of transitional forms that precede productive multi-word utterances is suggested in light of these results.

References

Harrison, P. L., Oakland, T., & Psychological Corporation. (2000). *ABAS, adaptive behavior assessment system* : manual. San Antonio, Tex.: Psychological Corporation.

O'Neill, D. K. (2009). *Language Use Inventory, An assessment of young children's pragmatic language development for 18- to 47-month-old children* [manual]. Waterloo, Ontario, Canada: Knowledge in Development.

Reese, E. & Read, S. (2000). Predictive validity of the New Zealand MacArthur communicative development inventory: Words and sentences. *Journal of Child Language*, 27(02), 255-266.

58 Comprehension of relative clauses by Brazilian Portuguese-speaking children

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This study addresses the comprehension of subject, direct and indirect object relative clauses by 20 Brazilian-Portuguese-speaking children aged between 5 and 6 years old in a context of sociolinguistic variation. In BP, standard pied-piping relatives alternate with Prepositional-Phrase-chopping strategy, without the preposition, and with a resumptive pronoun strategy, which maintains the preposition in situ followed by a resumptive pronoun of the relativized Noun-Phrase. Standard non-prepositioned relatives alternate with the resumptive pronoun strategy. PP-chopping and standard non-prepositioned relatives are the most frequent variants observed in adult speech. Comprehension was assessed by a picture-selection task composed by 36 stimuli and 20 fillers following Arnon's (2011) methodology. Children were asked to identify the colour of an entity's accessory specified by a relative clause. Each stimulus presents two events with the same entities using the same accessory (e.g. a hat) but with their roles reversed (e.g. a lion feeding a monkey, a monkey feeding a lion) and a distractor (e.g. a lion carrying a camera). The experiment employed a 3 x 2 design with extraction type (subject, direct and indirect object), variant (PP-chopping and pied-piping for indirect relatives, standard and resumptive pronoun for non-prepositioned relatives) as indepen-

dent variables including children's age. The logistic regression showed effect of extraction type only, with subject relatives being easier to comprehend. Interaction between extraction type and variant was observed only for direct object relatives, with better comprehension of standard than resumptive variant whilst both subject and indirect relative variants were respectively well and poorly comprehended. These results corroborate other studies that show that syntactic structure of relatives affects children's comprehension (Villiers et al, 1979; Mak et al., 2006), and the asynchrony between comprehension and production (Arnon, 2011), since comprehension of PP-chopping and standard direct object variants lags behind their production by Brazilian-speaking children observed in a production experiment.

References

Arnon, I. (2011). Relative clause acquisition in Hebrew and the learning of constructions. In: Kidd, E. (ed) *The Acquisition of Relative Clauses: processing, typology and function*. (pp. 107-139) Amsterdam: John Benjamins..

Mak, W. M., Vonk, W. & Schriefers, H. (2006). Animacy in processing relative clauses: The Hikers that rocks crush *Journal of Memory and Language*, 54, 466-490.

Villiers, J. G. et al (1979). Children's Comprehension of Relative Clauses. *Journal of psycholinguistic Research*, 8(5), 449-518.

59 Acquisition of pronoun anaphoric expressions in a pro-drop language

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In early child language the use of pronouns is deictic. The use of pronouns bound to their antecedents implies child's ability to use more complex syntactic expressions marking child's language development on a sentence and discourse level. In Croatian, as a pro-drop (or a null-subject) language, the pronoun can be omitted leaving only morphological marking for person, gender, case on other constituents. The easier the anaphora resolution is, the more probably the pronoun omission will occur. On the other hand, contextual cues, cognitive status constraints

(Gundel et al., 1993) in a conversational situation also play a role in identifying the right anaphora reference.

The aim of this study is to show a developmental change in the children's reliance on contextual or syntactic/pragmatic hierarchies. To this aim an eye-tracking experiment has been devised employing a visual world paradigm. Pictures with and without contextual cues have been presented accompanied by the sentences containing anaphoric expressions with the overt pronoun or with the pronoun dropped. All combinations (2x2) were presented to a group of children (first-graders) and a group of adults (age 20-45).

The differences in the gaze orientation at the specific moment (Just and Carpenter, 1980) reveal different anaphora resolution strategies, i.e. the reliance on different cues. While children rely more on the context, the adults shift reference mainly due to the violation of the "syntactic" hierarchy (overt pronoun where the null-subject is expected, results in the reference resolution shifted to the object). Therefore, not only that a single account of anaphora resolution does not explain all expression possibilities in a given language, but these accounts may be subject to developmental changes from childhood to adulthood.

References

Gundel, J. K., Hedberg, N., & Zacharski, R. (1993). Cognitive Status and the Form of Referring Expressions in Discourse. *Language*, 69(2), 274-307.

Just, M. A., & Carpenter, P. A. (1980). A Theory of Reading: From Eye Fixations to Comprehension. *Psychological Review*, 87(4), 329-354.

60 Comparing subject realization in French-speaking and Spanish-speaking young children at the grammatical and pragmatic interface

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It has now been established that young children tend adjust referring expressions to the dialogical status of the referent. This issue is all the more crucial as it concerns the simultaneous development of structural and functional aspects of language. For instance, early uses of null or weak forms in subject position are determined both by morpho-

syntactic development and discourse-pragmatic factors. But, grammatization is also characterized by transitional phenomena, such as filler syllables in the pre-verbal position or the progressive setting of inflectional paradigms. This study aims to explore the interaction between pragmatic factors and these transitional processes in two romance languages differing on the expression of subjects, French and Spanish.

The analysis was carried out on ten longitudinal corpora of five Spanish-speaking children and five French-speaking children aged between 1;10 and 2;6 in naturally occurring dialogues. Uses of forms in subject position (null forms, filler syllables, person agreement, non-finite forms, overt pronominal, lexical forms) were considered according to the targeted referent (entities, self, interlocutor, others), to givenness of the referent and to their antecedents in adult's discourse.

Results confirm the intertwining of pragmatic and grammatical development. Children present similar discourse pragmatic and dialogical developmental trends and language specific paths. For previously mentioned referents, Spanish speaking children use person agreement more often than unmarked forms and, in French, clitic pronouns co-exist with null forms and fillers. In French, fillers and omission are more frequent for reference to the self than for reference to entities, and in Spanish non-expected forms (unmarked forms and errors in agreement) are observed in similar contexts. In addition, the influence of antecedents in the adults' utterances appears to be a complementary factor for the choice of referring expressions. The discussion deals with the respective weight of linguistic, referential and dialogical factors.

References

Aguado-Orea, Javier, & Pine, Julian M. (2002). There is no evidence for a "no overt subject" stage in early child Spanish: a note on Grinstead (2000). *Journal of Child Language*, 29, 865-874.

Caet, Stéphanie. Développement de la référence à soi chez une enfant de 1; 05 à 3; 00: de l'influence de l'input à la reconstruction du système. *Journal of French language studies*, 22(01), 77-93.

Rojas-Nieto, Cecilia. (2014). Verb sequences and early verb inflection in Spanish: Frequency, patterning and possible effects. *Language, Interaction and Acquisition*, 5(1), 82-99.

Serratrice, Ludovica, & Allen, Shanley E. M. (2015). *The acquisition of reference*. Amsterdam: John Benjamins.

61 Acquisition of Imperative Mood in Pronoun-Reversing Children

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This study focuses on two English-acquiring children, Naima (CHILDES, ages 2;1 -2;6) and Peter (ages 2;0 - 4;5) whose language development is characterized by pronoun reversal errors (an 11-month period in Naima and 2-year period in Peter). Pronoun reversal refers to a systematic use of the 2PSG 'you' for self-reference and 1PSG 'I' for the addressee ('You need a raisin' means 'I need a raisin' and 'I'm cutting a kiwi' means 'You're cutting a kiwi') (Evans & Demuth 2013). Our central research question is how pronoun-reversing children express meanings interpreted by caregivers as imperatives ('commands'), that is, sentences intended to elicit an action from hearers. In English, use and interpretation of imperatives are dependent on the precise understanding of the usually implied pronoun 'you' (e.g. '(You) give me that car') (Hamblin 1987). We hypothesize that pronoun-reversing children will show a delay in acquiring the morpho-syntactic properties of imperatives and use alternative constructions to express imperative meaning.

An analysis of Naima's files 46-59 and Peter's data shows that both children were prolific users of 'want' or 'need' control-structures such as 'want _ cut it little' (which means 'want Mama to cut it into little pieces'; the dash shows an unexpressed agent). Following Landau & Thornton (2011), imperative want-utterances were analyzed for the following properties: (a) null vs. overt subject in matrix and embedded clauses, (b) referential characteristics of matrix and embedded subjects and (c) tense-agreement properties of matrix/embedded predicates. An analysis of clauses prefaced with 'want', along with their semantic and pragmatic characteristics, suggests that they are structural precursors of imperative mood, a distinct modal/irrealis category. This study highlights the relevancy of individual child data and shows how an analysis of linguistic properties which are typically studied separately (want-utterances and pronominal reference) provides us with a comprehensive picture of children's developing grammars.

References

- Anscombe, G. E. M. (2000). *Intention*. Cambridge: Harvard University Press.
- Evans, K. and K. Demuth (2012). Individual differences in pronoun reversal: Evidence from two longitudinal case studies. *Journal of Child Language*, 39, 162-191.
- Hamblin, C. L. (1987). *Imperatives*. Basil Blackwell: New York.
- Huls, E. and C. van Wijk. (2012). The development of a directive repertoire in context: A case study of a Dutch-speaking young child. *Journal of Pragmatics*, 44, 83-103.
- Landau, I. and R. Thornton (2011). Early child control. *Lingua*, 121, 920-941.

62 The role of the child-directed speech in the acquisition of reflexive constructions in the Croatian language

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Studies on the acquisition of reflexive constructions (RC) have shown that children produce intransitive reflexive constructions (IRC) in higher proportion than the transitive reflexive constructions (TRC) during the acquisition. Formal approaches explain this pattern by the simple argument structure of the IRC (e.g., Babyonyshev et al. 2001). The functionalist perspective views the frequency of the construction subtype in the child-directed speech (CDS) as crucial factor (e.g., Braine and Brooks 1995). Goldberg and co-authors (e.g., Boyd and Goldberg 2009) state that the acquisition of the construction subtype is enhanced by the presence of highly frequent verbs in that subtype in CDS. This study examines three possible predicting factors of the RC acquisition: (1) the construction type, (2) CDS and (3) the most frequent verbs in RC.

Method

The data have been extracted from the Croatian Corpus of Child Language which contains the spontaneous linguistic production of three children aged 1;2-3;2. RCs were extracted using the CLAN software (1067 in child language (CL), 2135 in CDS) and analysed.

Results

- (1) IRC constructions are the most frequent RCs in CL and in CDS (above 80%).
- (2) The RCs (%) in CDS predicts the RCs (%) in CL ($F(1, 53)=13.086$, $p=.001$, $R^2=.198$, $Beta=.445$) and errors (%) ($F(1, 51)=9.375$, $p=.004$, $R^2=.155$, $Beta=-.394$), but only IRC (%) in CL increases with age. The IRC (%) in CDS predicts the RC (%) in CL and errors in (%) CL; the opposite is true for the TRC (%) in CDS.
- (3) The two most frequent RCs in CDS are both IRC and predict the number ($F(53)=57.431$, $p=.000$, $R^2=.52$, $Beta=.721$) and the percentage of RC in CL ($F(53)=4.859$, $p=.032$, $R^2=.084$, $Beta=.290$) as well as the errors (%) ($F(51)=4.051$, $p=.05$, $R^2=.072$, $Beta=.269$).

Conclusion

The results suggest that the structure of the CDS predicts the acquisition pattern for RC in Croatian.

References

Babyonyshev M., Ganger J., Pesetsky D. and Wexler K. (2001). The maturation of grammatical principles: evidence from Russian unaccusatives. *Linguistic Inquiry*, 32, 1-43.

Braine M. D.S. and Brooks P. J. (1995). Verb argument structure and the problem of avoiding an overgeneral grammar. In M. Tomasello and W. E. Merriman (Eds.). *Beyond names for things: young children's acquisition of verbs* (pp. 352-376). Hillsdale, NJ: Erlbaum.

Boyd J. K. and Goldberg A. E. (2009). Input effects within a constructionist framework. *The Modern Language Journal*, 93, 418-429.

Swedish Roma children face even more multilingual situations. By age 5 these differences have resolved. Discussion: Two points deserve discussion: why is performance so good and why are there no verb differences? Passives are rare, and adjectives are different in Romani. One possibility is that because Romani has relatively flexible word order, the case ending is a major, and reliable, clue.

References

Guasti, M.T (2016) Voice alternations. In: Lidz, J.; Snyder, W. & Pater. J. (eds) *Oxford Handbook of Developmental Linguistics*. Oxford press.

Kyuchukov, H. (2007) How do children learn Romani syntax? In: Penka Ilieva-Baltova and Krasimira Petrova (eds.) *Psycholinguistic studies*. Sofia: Riva Publishers, pp. 271-281.

Matras, Y. (2002) *Romani: A linguistic Introduction*. Cambridge: CUP

63 The case of the passive: comprehension in Romani-speaking children

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Background: Several studies across different languages have found comprehension of the passive is delayed, and that certain types of verbs give especial difficulty such as psych verbs (love, see), though object experiencer verbs (frighten, scare) might be as easy (Guasti, 2016) or easier than action resultatives (pull). It is claimed that some children may understand passives as adjectival forms, and psych verbs make poor adjectives (?the seen dog). In languages where the adjectival form is different, as in Greek, passive comprehension is worse. In developing language assessments for young Romani speakers, a 16-item test of passives was developed that contained these verb types. The passives were indicated by ablative case on the agent (Matras, 2002), which does not vary across the verb types. Passives are rare and judged unusual by native Romani adults. Method: 84 children aged 3 to 6 acquiring Romani in 3 Roma communities: Macedonia, Serbia and Sweden, were tested by a native speaker using a picture choice task with 3 choices for reversible passive forms. Results: The children showed surprisingly good performance with 3 year olds around 60%, 4 year olds 75%, 5 year olds >80%. Unlike previous results, there was no difference between psychological verbs and action verbs (see graph in attached material). Object experiencer verbs also showed no advantage, nor do resultatives. In terms of country differences, the Serbian Roma outperform the others at age 3 and 4, perhaps because Macedonian and

64 Digging up the building blocks of language: Age-of-Acquisition effects for multiword phrases

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Traditionally, words are seen as basic building blocks for language learning. Recent years, however, have seen increased interest in the idea that multiword phrases also serve as integral building blocks for language [1]. Accordingly, there is growing evidence that children and adults are sensitive to the distributional properties of multiword sequences in production and comprehension [2]. Here, we go beyond existing findings to show that multiword phrases serve as building blocks for language learning. We do this by showing that multiword phrases, just like words, show Age-of-Acquisition effects in adult processing. Words that are acquired earlier show processing advantages in a variety of tasks [3]. These AoA effects illustrate the effect of early-acquired words on the adult lexicon. If multiword units also serve as building blocks for language learning, they should also exhibit AoA effects. Early-acquired sequences should be responded to faster than later-acquired ones (after controlling for their properties in adult language use). We provide support for this prediction in two reaction time studies with adults.

We estimated the AoA of trigrams using a combination of corpus-based measures and subjective rating to create pairs of trigrams that are matched

on all adult frequencies (unigram, bigram, and trigram); plausibility; and lexical AoA (e.g., early: a good girl vs. late: a good dad, early-take them off, late-take time off). In two studies with two sets of items, we used a phrasal-decision task to show that early-acquired trigrams are responded to faster than later-acquired ones (after controlling for all frequency measures and plausibility). This is the first study, to our knowledge, to uncover AoA effects for units larger than single words. These findings join the growing evidence that speakers are sensitive to the distributional properties of multiword sequences; suggest that both words and larger units are used in learning; and highlight the effect of early knowledge on learning.

References

Arnon, I., & Snider, N. (2010). More than words: Frequency effects for multi-word phrases. *Journal of Memory and Language*, 62(1), 67–82.

Bannard, C., & Matthews, D. (2008). Stored word sequences in language learning: The effect of familiarity on children's repetition of four-word combinations. *Psychological Science*, 19(3), 241–248.3.

Juhasz, B. J. (2005). Age-of-Acquisition effects in word and picture identification. *Psychological Bulletin*, 131(5), 684–712.

65 The acquisition of dislocation structures: dialogue and interaction

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Dislocation is an important feature of spoken French, especially in child language and child directed speech (cf. De Cat, 2007). It is also strongly associated with topic marking (cf. *ibid.*, *inter alia*).

De Cat (2007) treated the discourse-pragmatic aspects of dislocation in the discourse of children and their caretakers and showed that even young children use this device in a pragmatically relevant way. Notley et al. (2007) show that in French-speaking children, there is a development from high frequency of right dislocation in younger children to more frequent use of left-dislocation by age 3, the latter ratio being considered to be conforming to the adult model.

Research has also shown that dislocation cannot be explained by topic marking alone: it is also linked to the organization of interaction itself (cf. Pekarek Doehler, 2001, *inter alia*). Dislocations that may seem redundant by means of information structuring actually seem to be highly relevant for e.g. mutual agreement or turn-taking.

In our study, we analyze the development of different types of dislocation not only with regards to adult input, but try to tackle the use of these structures in the light of the dynamics of both dialogue and interaction management.

9 French-speaking mother-child dyads (children's ages between 2;00 and 3;00) were audio- and videotaped in natural interactions at their homes. Null forms, nouns, pronouns and dislocations were identified and analyzed according to morpho-syntactic features, pre- or postverbal position in the utterance, information status, position in dialogue and topicality.

Our results suggest that dislocation is largely used for topic marking in French, but not exclusively: children, as well as their caretakers, also use it as means of interaction management. Discussion will deal with the relative importance and interaction of linguistic, discourse-pragmatic and interaction-related factors involved in acquisition and use of referring expressions.

References

De Cat, C. (2007). *French Dislocation: Interpretation, Syntax, Acquisition*. OUP Oxford.

Notley, A., Van der Linden, E., & Hulk, A. (2007). Cross-linguistic influence in bilingual children: the case of dislocation. *Amsterdam Studies in the Theory and History of Linguistic Science Series*, 291, 229258.

Pekarek Doehler, S. (2011). Emergent grammar for all practical purposes: the on-line formatting of left- and right dislocations in French conversation. In P. Auer & S. Pfänder (Ed.), *Constructions: Emergent and emerging* (pp. 45–87). Berlin: Mouton de Gruyter.

66 Preferred Argument Structure in Cree child and child-directed speech

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A crucial task facing children is determining how and where to realize referents in their utterances to facilitate communication effectiveness. Speakers typically choose forms and placement that signal to their interlocutor how accessible referents are in the discourse context (Ariel, 1994). Newly introduced referents tend to be realized by full lexical NPs and appear in S or O position, while given referents are typically realized by pronouns or null forms and appear in A position; this set of patterns has been formalized as Preferred Argument Structure (PAS; Du Bois, 1987).

For a range of typologically distinct languages, PAS accurately describes the distribution of argument forms in child speech (Du Bois, Kumpf, & Ashby, 2003). However, in all these languages the subject precedes the object, calling into question whether PAS is sensitive to linear order of elements (A/S<O) or to syntactic role of elements. Here we evaluate PAS in Cree, a language with OVS word order, where these two factors can be teased apart. We focus on the grammatical constraints of PAS – i.e. the form and placement of arguments.

Data are taken from ten sessions of naturalistic interaction between a child aged 4;6-5;10 and his caregiver. Both are native speakers of northern East Cree, a polysynthetic Central Algonquian language spoken in northern Canada. Both child and caregiver verbal utterances contain about 70% null arguments, 21% lexical arguments, and 9% pronominal arguments. Both child and caregiver also follow PAS in their form distribution: pronouns and null forms appear predominantly in A position, and few verbal utterances have two lexical arguments. Therefore, Cree child and caregiver data suggest that speakers correlate information structure with grammatical role, rather than with linear ordering of arguments.

References

- Ariel, M. (1994). Interpreting anaphoric expressions: A cognitive versus a pragmatic approach. *Journal of Linguistics*, 30, 3-42.
- Du Bois, John W. (1987). The discourse basis of ergativity. *Language* 63: 805855.
- Du Bois, J. W., Kumpf, L. E. & Ashby, W. J. (2003). eds. Preferred argument structure: Grammar as architecture for function. Amsterdam: Benjamins.

67 Cues to questionhood: Subject-verb inversion in child-directed speech

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Questions make up nearly one-third of maternal utterances in English-speaking families [1]. Children recognize questions from early on; 12-month-old infants can distinguish between interrogative and declarative word order [2] and, when watching conversation, 30-month-olds look anticipatorily to addressees after hearing a question. We present findings from the first of a series of studies in which we try to unravel which specific linguistic cues chil-

dren might use to recognize questions in unfolding speech. We focus first on subject-verb inversion (SVI), often used to mark polar questions. How reliably does SVI cue questionhood and what makes it recognizable?

We extracted 8,644 caregiver utterances with SVI from 211 transcripts of caregiver-child interaction in Dutch [3]. We coded each utterance for the verb and subject form used and whether it was a question (required a yes/no response). The majority of SVI constructions (79.5%; 6,869) were questions. The second-person singular pronoun (“je”/“jij”) appeared more often as the subject in questioning compared to non-questioning SVI utterances (62% vs. 46%) while first person subjects occurred more often in non-questioning SVI utterances (singular “ik”: 9% vs. 18%; plural “we”/“wij”: 8.4% vs. 13.1%). The verbs “willen” (want), “zullen” (shall), “hebben” (have), “weten” (know), and, “zien” (see) occurred more often in questioning SVI utterances while “moeten” (must/should), “kunnen” (can), “doen” (do), and “vinden” (find) occurred more often in non-question SVIs. In combination with a second-person singular subject, want and have appeared most often with questioning SVIs while must/should and can strongly predicted non-questioning SVIs.

These results suggest that the SVI-construction is a reliable cue to questionhood and that the second person pronoun and specific verb form used can help children to further recognize questioning utterances in this context. Children’s real-time use of these cues to predict upcoming speaker changes in conversation will be further investigated in an experimental setting.

References

- Rowe, M. L. (2008). Child-directed speech: relation to socioeconomic status, knowledge of child development and child vocabulary skill. *Journal of Child Language*, 35(1), 185–205. doi: 10.1017/S0305000907008343.
- Geffen, S., & Mintz, T. (2014). 12-month-olds use word order to distinguish between declaratives and polar interrogatives. *Language Learning and Development* 1(15). doi:10.1080/15475441.2014.95159.
- MacWhinney, B. (2000). *The CHILDES Project: Tools for analyzing talk*. Third Edition. Mahwah, NJ: Lawrence Erlbaum Associates.

68 Determiner’s emergence in early French at the crossroads of phonology and pragmatics

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Several studies (Peters, 2001) have shown that throughout the process of determiner's acquisition, children may omit the determiner, produce filler syllables or adult-like determiners. These forms have been analysed in morpho-syntactic, prosodic (Demuth, 2001) or pragmatic perspectives (Salazar Orvig et al., 2013), but only few works have combined at once some of these perspectives and systematically taken transitional forms into account.

This study aims first to look into this variation in the pre-nominal slot and then to observe specifically children's uses of filler syllables, examining simultaneously prosodic, phonological and pragmatic factors.

Our study is based on a video-recorded corpus of two children: Adrien and Madeleine. For both children, we selected 6 sessions, from 2;5 to 3;5 (MLU 1.08-3) for A. and from 1;7 to 2;2 (MLU 1.6-3.26) for M. For each noun occurrence, we observed whether it was preceded by a determiner, a filler or a null form. Each occurrence was then characterized according to prosodic (number of syllables of the noun and phonological phrase) and pragmatic factors (type of reference and discursive status of the referent). We also characterized the phonological form of all the fillers and determiners produced in the corpus.

Preliminary results show that most of the productions seem to be constrained by the prosodic structure and that children also appear to produce null forms and determiners with contrasted pragmatic functions. Regarding the particular use of fillers, we have observed that their various phonological forms seem to be associated to specific pragmatic contexts. The distribution of forms could then reflect the child's early sensitivity to the relationship between forms and functions. These results also imply that the influence of formal and functional factors should be observed together rather than separately to get a more clearly defined picture of determiners' emergence and get closer from the understanding of the child's uses of pre-nominal forms.

References

- Peters, A. M. (2001). Filler syllables: what is their status in emerging grammar? *Journal of Child Language*, 28(1), 229-242
- Demuth, K. (2001). A prosodic approach to filler syllables. *Journal of Child Language*, 28(1), 246-249
- Salazar Orvig, A., Marcos, H., Caët, S., Corlateanu, C., Da Silva, C., Hassan, R., Heurdier, J., Le Mené, M., Leber-Marin, J. & Morgenstern, A. (2013). Definite and indefinite determiners in French-speak-

ing toddlers: Distributional features and pragmatic-discursive factors. *Journal of Pragmatics*, 56, 88-112

ZONE 5

69 The Effect of Givenness on Object Order in Croatian Monolingual Children

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This research investigates how monolingual Croatian children (n=56, ages 3;8-5;2, mean: 4;4) implement different givenness values in their ditransitive structures. Previous research shows that givenness influences object order and yields DO-IO with given themes, and IO-DO with given recipients (de Marneffe et al. 2012). However, the literature provides contrastive results: children produce both given-before-new and new-before-given utterances (Narasimhan and Dimroth 2008). The corpus data of Croatian ditransitives shows that children ages 2;5 produce both givenness orders. Our adult data indicates that adults have a give-before-new preference.

The experimental design consisted in a board that only the child could see and that functioned as a separator between the child and experimenter (Eisenbeiss 2011), the child had to describe images depicting ditransitive actions given by the experimenter and place them on the board. The test consists in four values of givenness: Nothing Given, DO Given, IO Given, All Given. We expect the influence of givenness on object order to become more relevant with age.

The results indicate the general trend is IO-DO (73% of all responses), presumably because the IO is animate. We found that the younger children (below the mean) significantly preferred IO-DO in the DO-G condition than in IO-G (84% of IO-DO in DO-G, 66% in IO-G, $p < 0.05$). This indicates a preference of new-before-given when the DO is given. The older children did not seem to be affected by the givenness manipulation of the DO, and equally prefer IO-DO across all conditions.

So, givenness has an effect, but not the effect we were expecting since there is a new-before-given preference in younger children (DO-G condition). The effect of givenness becomes more relevant with age, because the proportion of new-before-given orders decreases significantly. More research is needed; the next step is neutralizing animacy and checking whether the givenness effect changes, along with examining the intonation of the objects.

References

- de Marneffe, M., Grimm, S., Arnon, I., Kirby, S. and Bresnan, J. (2012). A statistical model of the grammatical choices in child production dative sentences. *Language and Cognitive Processes* 27(1), 25-111
- Eisenbeiss, S. (2011). CEGS: An elicitation tool kit for studies on case marking and its acquisition, Essex Research Reports in Linguistics, (60)1. Dept. of Language and Linguistics, University of Essex, Colchester, UK
- Narasimhan, B., & Dimroth, C. (2008). Word order and information status in child language. *Cognition*, 107(1), 317-329.

70 Acquisition of Locative Utterances in L1 Norwegian: Structure-building via Lexical Learning

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This paper is concerned with the acquisition of locative prepositional phrases, and addresses the question whether lexical properties of locative items, e.g. input frequency, morphological complexity, phonological salience, semantic unambiguity, etc., influence the rate of acquisition (Johnston and Slobin 1979; Kern, Gayraud & Chenu 2014).

Building on our previous research on L1 Russian, we investigate the acquisition of locative structures in early L1 Norwegian. In Russian, basic locative prepositions are phonologically weak and semantically ambiguous. Norwegian, on the other hand, possesses both highly frequent, phonologically weak and semantically ambiguous prepositions (e.g., *i* 'in', *på* 'on', ex.1), and strong prepositions, which are less frequent in the input, can carry stress and are unambiguously locative in meaning (e.g., *inni* 'in', *oppi* 'in', *oppå* 'on', etc., ex.2).

- | | | | | | |
|-----|---|----------|----------|----------|----------|
| (1) | <i>i</i> / <i>på</i> | <i>e</i> | <i>s</i> | <i>k</i> | <i>a</i> |
| | <i>in</i> / <i>on</i> | box. DEF | | | |
| (2) | <i>inni</i> / <i>oppi</i> / <i>oppå</i> | <i>e</i> | <i>s</i> | <i>k</i> | <i>a</i> |
| | <i>in</i> / <i>in</i> / <i>on</i> | box. DEF | | | |

We report the results of two production experiments and one corpus study involving altogether seventy monolingual children acquiring a dialect of Norwegian. The results suggest that phonologically salient and semantically unambiguous locative items are acquired prior to their phonologically weak and ambiguous counterparts, despite the former being morphologically more complex and substantially less frequent in the input. Furthermore, our results show that Norwegian 2-year-olds tend

to produce locative utterances involving preposition omission at lower rates than their Russian peers.

We argue that these results are in line with the structure-building lexical learning hypothesis (Clahsen et al. 1996) and suggest that children's grammars at early stages involve an underspecified Place category, associated with a generalized locative semantics. Finer-grained locative contrasts then develop gradually, based on the acquisition of individual locative items from the input, with phonological salience and/or semantic unambiguity significantly facilitating the rate of acquisition.

References

- Clahsen, H. S. Eisenbeiss & M. Penke. (1996). Lexical Learning in Early Syntactic Development. In H. Clahsen (Ed.), *Generative perspectives on language acquisition: Empirical findings, theoretical considerations and crosslinguistic comparisons*. Amsterdam: Benjamins.
- Johnston, J. R., & Slobin, D. I. (1979). The Development of Locative Expressions in English, Italian, Serbo-Croatian and Turkish. *Journal of Child Language*, 6(3), 529-545.
- Kern, S., Gayraud, F., & Chenu, F. (2014). The role of input in early first language morphosyntactic development. *LIA Language, Interaction and Acquisition*, 5(1), 1-18.

71 Late L1 Learners Acquire Simple but Not Syntactically Complex Structures

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The outcome of late L1 acquisition is significantly worse than that of late L2 learning.¹ Whether these effects are systematic with respect to syntactic acquisition is unknown. If the trajectory of late L1 acquisition parallels child language acquisition, then late L1 learners should acquire simple, mono-clausal structures, because child acquisition begins with these types of structures.² In addition, if late L1 learners run out of developmental time, due to their late start in the acquisition process, they would not be expected to acquire complex structures.

To test the hypothesis, we conducted a syntactic comprehension experiment. The ASL structures (N=14) ranged from simple to complex based on the number of clauses contained (mono-clausal, bi-clausal, and inter-sentential). Using a sen-

tence-to-picture matching paradigm, each structure was tested with 6 exemplars. The 84 stimuli (and 3 accompanying alternative pictures) were randomly presented by computer which recorded response and RT. Accurate performance on 4/6 trials indicated mastery of a given structure at a level of $p < .01$. A pre-screening task ascertained that lexical knowledge was not a performance factor. Thirty-seven, adult ASL signers who were born deaf volunteered: 30 native signers; 3 late L2 learners (native learners of Russian or Mexican Sign Language, AoA 14-16); and 4 late L1 learners (AoA 13-21).

The native signers showed mastery of all the ASL structures with fast RTs. The late L2 learners' performance resembled that of the native signers across all the structures. As predicted, the late L1 signers showed mastery of most simple structures, but few bi-clausal or inter-sentential structures. Using only sign languages, the results replicate the finding that the outcome of late L1 acquisition is much worse than late L2 learning. Equally important, the results provide evidence for the hypothesis that late L1 acquisition resembles child L1 acquisition insofar as both begin with mono-clausal structures.

References

- Newport, E. L. (1990). Maturation constraints on language learning. *Cognitive Science*, 14(1), 11-28.
- Mayberry, R. I., Lock, E., & Kazmi, H. (2002). Linguistic ability and early language exposure. *Nature*, 417(6884), 38-38. doi:10.1038/417038a
- Cormier, K., Schembri, A., Vinson, D., & Orfanidou, E. (2012). First language acquisition differs from second language acquisition in prelingually deaf signers: *Cognition*, 124, 50-652
- Diessel (2004). *The acquisition of complex sentences*. Cambridge Univ Press.

72 Why do L1 and L2 children fail to successfully comprehend OVS sentences?

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Previous studies on off-line sentence comprehension in children in their first or second language (L1c, L2c) have shown that their performance on OVS sentences is cross-linguistically poorer than in L1 adults (L1a) (e.g. Marinis & Saddy, 2013; Dittmar, Abbot-Smith, Lieven, & Tomasello, 2008). It

is unknown, however, whether this less successful off-line comprehension is the result of 1) a lack of knowledge of the linguistic cues and/or 2) a difficulty in integrating relevant cues due to limited working-memory capacity and slower processing speed and/or 3) a difficulty in revising initial misanalyses, possibly due to a deficit in inhibitory control when compared to adults. Last but not least, 4) the off-line task itself might impose additional cognitive costs. In the present poster we attempt to disentangle this issue while presenting on-line (visual world eye-tracking paradigm) and off-line data (picture-matching task) of L1 and L2 7-year-olds as well as L1a. We tested a) unambiguous declarative OVS sentences introduced by a masculine accusative first NP, marked on the article (den Opa, the grandpa; $n = 10, 11, 13$) (Cristante, Schimke 2017) and unambiguous wh-questions ($n = 16, 11, 16$), including b) an accusative question pronoun (Welchen TigerØ, which tiger) and c) an accusative question pronoun and an accusatively marked noun (Welchen Affen, which monkey; Affe, nom.; Affen, acc.). We expect L1c and L2c to perform better with c) as the sentences include a further disambiguating cue on the noun, then with b) because in the absence of a context, questions are more simple to process than declarative sentences. We discuss the data by showing in detail 1) whether and how the three groups reveal linguistic knowledge of the case marking cues, i. e. whether they show on-line reaction to them and whether the double marking has an effect, 2) in the presence of a reaction, whether its amplitude or timing is different in the three groups and, finally 3) whether they perform better on-line than off-line.

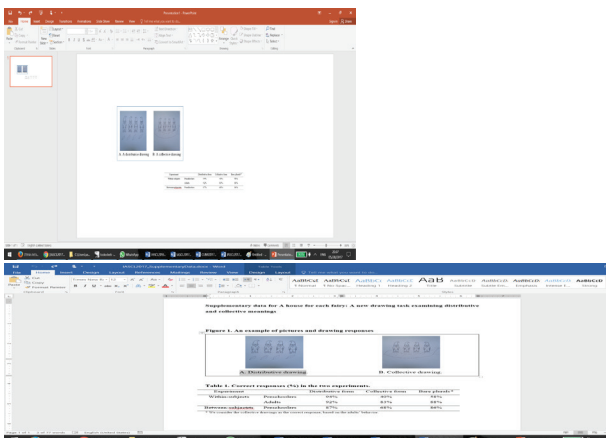
References

- Cristante, V., & Schimke, S. (2017). Verarbeitung von Passiv- und OVS-Sätzen bei Kindern mit Deutsch als früher L2. In S. Schimke & H. Hopp (Eds.), *DaZ-Forschung [DaZ-For]: Vol. 13. Sprachverarbeitung im Zweitspracherwerb*. Berlin: de Gruyter Mouton.
- Dittmar, M., Abbot-Smith, K., Lieven, E., & Tomasello, M. (2008). German Childrens Comprehension of Word Order and Case Marking in Causative Sentences. *Child Development*, 79(4), 1152-1167.
- Marinis, T., & Saddy, D. (2013). Parsing the Passive: Comparing Children With Specific Language Impairment to Sequential Bilingual Children. *Language Acquisition*, 20(2), 155-179.

73 A house for each fairy: A new drawing task examining distributive and collective meanings

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This study examined how children learn to distinguish between distributive and collective meanings of universal quantifiers in a language that represent the distinction morphosyntactically (and not lexically like English's "each" vs. "all"). Hebrew uses a single universal quantifier ("KOL") with a singular noun for the distributive meaning ("KOL <noun>sing") and with a definite plural noun for the collective meaning ("KOL hadet<noun>pl"). Using a novel drawing task, we instructed Hebrew-speaking preschoolers and adults to add drawings to given pictures of multiple items according to sentences including the distributive form ("tzayer bait le-kol feyasing"/ draw a-house for-each fairy), the collective form ("tzayer bait le-kol ha-feyotpl"/ draw a-house for-all the-fairies), or plural (no-quantifier condition; tzayer bait l-a-feyotpl"/ draw a-house for-the-fairies). In a within-subject design presenting the three conditions interchangeably, adults produced distributive drawings, adding one object per item to the pictures, following distributive instructions, and collective drawings, adding one single object to the pictures, following collective and no-quantifier instructions. By contrast, Children tended to produce distributive drawings regardless of the instructions. A second between-subject design experiment was administered to three different groups of preschoolers, each hearing only one of the forms. Here, children produced more collective drawings following both collective and no-quantifier instructions than in the within-subject design. That is, collective responses were given more consistently when distributivity was not introduced in the context of the experiment. More importantly, the rate of collective drawings was significantly higher following no-quantifier than collective instructions, as children produced higher rates of distributive drawings following collective instruction. This may suggest that quantifiers themselves drive children's preference for distributivity, supporting claims that children use one-to-one pairing between nouns when they are unsure how to link quantifiers and nouns¹. It is undetermined whether this is more enhanced in languages using the same quantifier for both collective and distributive meanings.



Correct responses [%] in the two experiments

* We consider the collective drawings as the correct response, based on the adults' behavior.

References

Brooks, P. J., & Braine, M. D. (1996). What do children know about the universal quantifiers all and each?. *Cognition*, 60(3), 235-268.

74 Factors associated with the early language development of New Zealand children

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Problem under investigation. This project was undertaken to establish reliable, population-based normative data on the early language development of children growing up in New Zealand (NZ). The project had two aims: (1) to develop nationally representative norms for early vocabulary and grammar based on a NZ adaptation of the MacArthur-Bates Communicative Development Inventory: Words & Sentences (NZ CDI:WS) and (2) to examine their association with demographic, family and child variables.

Methods. The target population was parents of monolingual, English-speaking children aged 16-30 months living in NZ. We aimed to collect data on 100 girls and 100 boys at each month of age via a dedicated website (www.kidswords.org), where parents completed an online version of the NZ CDI:WS and a demographic questionnaire. Parents of over 2,600 children participated, representing 87% of our target. 51% of the children were girls; 62% were first-born; 3% were twins and all 16 regions of NZ were represented.

Results and conclusion. Children's expressive vocabulary size ranged from a mean of 67 words [95% CI = 58, 76] at age 16 months to 477 words [95% CI = 453, 502] at 30 months. Age accounted for 47% of the variance in vocabulary size in this age range, while sex, birth order, and whether the child was a twin accounted for 3% additional variance. Similarly, age accounted for 42% of the variance in grammatical complexity scores (CDI section E), with the same factors accounting for 1.6% additional variance. Vocabulary size and grammatical complexity scores were highly correlated ($r = .85$; 95% CI = .84, 1.00). Percentiles for vocabulary size will be presented and cross-linguistic comparisons will be made between the NZ data and CDI data from other countries. Further uses of the data collected from this project will be discussed.

75 Supporting Low-Income Preschoolers' Academic Language Skills through Co-Constructive - Elaborative Storytelling

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From the time they enter preschool, low-income children score below the norm on measures of language and literacy, and this achievement gap achievement grows over time. Policymakers have, thus, sought ways to support the emerging skills of children at-risk of experiencing school failure. Co-Constructive Elaborative Storytelling (CET) is an innovative classroom storytelling program that trains teachers to support children's reading readiness by using rich, elaborative language as they share culturally-relevant oral stories during their circle-time routines. This study explored the effectiveness of CET in supporting preschoolers' reading readiness, by examining the academic language skills of children enrolled in CET vs. control classrooms.

Participants included 108 English-dominant, low-income preschoolers (Mage=45.72 months, SD=6.78; 57% girls; 56% Latino) whose teachers (N = 12) had been trained in CET or a reading-based control, and had implemented their assigned program twice-a-week for a 6-month period. At the end of the year, children were engaged in a narrative production task using a story stem from The MacArthur Story Stem Battery (Emde et al., 2003). Narratives were audio-recorded, transcribed and verified using CHAT conventions. Coding and analysis is ongoing and focuses on the following indices of academic language: Context, chronology, and theme, using an adaptation of Reese et al.'s (2001) narrative coherence coding; vocabulary diversity, using CHILDES VOCB programs; and sophisticated/rare language, through a recently validated list of common words for preschoolers (Authors, nd). Preliminary findings suggest that children in CET classrooms shared stories with more evaluative language and sophisticated themes, as well as demonstrated greater vocabulary diversity and used more rare/sophisticated language than children in control classrooms. Results are discussed in relation to the importance of adopting a strengths-based approach to supporting low-income preschoolers' academic language skills, as well as implications for both practice and policy.

76 A Randomized Controlled Trial of an At-Scale Language and Literacy Intervention in Childcares in Denmark

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Research suggests that systematic and explicit curriculum-based language and literacy preschool interventions improve children's language and literacy outcomes. However, most of this research was done in the U.S. on a relatively small number of children from primarily low-income homes and focused on efficacy rather than "real-life" effectiveness at scale.

We evaluated a systematic and explicit language-literacy intervention at scale, including all children in the participating childcares in Denmark, a country with little focus on school-readiness-related skills. The intervention consisted of 40 high-quality book-reading lessons with an explicit scope and sequence of language and literacy instruction targeting phonological awareness, print awareness, vocabulary and narrative development. Childcare educators delivered 40 30-minute biweekly lessons.

We examined the effect of the intervention in three arms: SPELL-basic, SPELL with supplementary home intervention, and SPELL with professional development of educators. Pre- and posttest scores were obtained using a standardized language and literacy test. Hierarchical linear modeling of change scores was the primary analysis. 142 childcares and 6,483 children participated.

Pre- to posttest comparisons revealed a significant impact of all three interventions for pre-literacy skills (ES = 0.21-0.27) but not language skills (ES = 0.04-0.16) with little differentiation among the three arms. Fidelity, indexed by number of lessons delivered (exposure), was a significant predictor of most outcomes. The effect did not differ significantly across subgroups defined by socioeconomic factors or being a dual language learner, although dual language learners gained relatively more from extra exposure. The results suggest that 1) language and literacy interventions can be effective in a pedagogical context quite different from that of the U.S., where most previous research was conducted, and 2) interventions that were proven effective in more controlled efficacy trials can successfully be taken at scale.

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A longitudinal study of the predictors of reading in Chilean children from low and high socioeconomic backgrounds

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Chile is one of the world's most unequal countries in terms of income distribution (OECD, 2010). This inequality strongly affects educational outcomes: already at age 7 children from low socioeconomic status (SES) families show significantly poorer reading language outcomes compared to children from high SES families. These differences have their roots in earlier home and preschool experiences.

This longitudinal study aimed to investigate how SES exerts its effect on reading, in a sample of Chilean children from low and high SES backgrounds. 133 children participated at time 1 (age 5), 106 at time 2 (age 7). At both time points, a number of potential early literacy (phonological awareness, rapid automatic naming, letter knowledge) and language predictors (receptive vocabulary, sentence repetition, semantic fluency) were evaluated. At time 1, a parental survey (Romero-Contreras, 2006) was administered to assess distal (e.g. family income, parental education) and proximal (e.g. frequency of language and literacy activities in the home) factors related to SES. Reading accuracy, fluency and comprehension were assessed at time 2.

SES had a strong and significant impact on reading (accuracy, fluency and comprehension), and on early literacy predictors and language predictors. The predictors were affected by SES at both time points. This study proposes several path analyses in order to evaluate the contribution of distal and proximal SES factors and literacy and language predictors to fluency, accuracy and comprehension. Path analyses show that distal and proximal SES factors contribute to variance in the predictors of reading at ages 5 and 7, and through that variance to reading accuracy, fluency and comprehension themselves at age 7.

The ultimate objective of this work is that determining more precisely how distal and proximal SES factors influence specific predictors of reading will enable the design of interventions that can more effectively target those factors which are likely to be modifiable (McKean, et al., 2015).

References

McKean, C., Mensah, F. K., Eadie, P., Bavin, E. L., Bretherton, L., Cini, E., & Reilly, S (2015). Levers for language growth: Characteristics and predictors of

language trajectories between 4 and 7 years. *PLoS One*, 10(8), e0134251. OECD (2010). PISA 2009 Results: Executive Summary.

Romero-Contreras, S. (2006). Measuring language- and literacy-related practices in low SES Costa Rican families: Research instruments and results. Doctoral Dissertation, Harvard University Graduate School of Education, Cambridge, MA.

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Planning improves the quality and quantity of child and teacher language in the preschool classroom.

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This study examines the association between the type of activity being carried out in the preschool classroom and the quality of the language spoken by teachers and children during those activities. Eighteen preschool classrooms serving low-income children between the ages of 3 and 4 in Santiago de Chile were audio-recorded during one morning shift. Recordings were transcribed and segmented into four planned and four non-planned activities (planned: greeting, learning experience, book sharing, book discussion; non-planned: breakfast, lunch, free play and other non-instructional time). A total of 113 activity segments were identified. Characteristics of teacher and child language were measured in each activity segment (teacher: language stimulation, teaching, directives, lexical diversity and mean length of utterance; child: proportion of child talk, lexical diversity, mean length of utterance). The association between type of activity and language characteristics was examined using multilevel multiple regression and path analysis. Results show that most of the variance in the language outcomes occurs between activity segments, not between classrooms, and a significant portion of it is explained by the planned/unplanned distinction. Planned activities are characterized by more language stimulation, more teaching, fewer directives, and more child talk, than non-planned activities. We discuss implications for teacher professional development in general and for early childhood education in Latin-America specifically.

References

Cabell, S. Q., Justice, L M., McGinty, A. S., DeCoster, J., Forston, L D. (2015). Teacher-child conversations in preschool classrooms: Contributions to

children's vocabulary development. *Early Childhood Research Quarterly*, 30, 80–92

Dickinson, D. K., Hofer, K. G., Barnes, E. M., Grifenhagen, J. F. (2014). Examining teachers' language in Head Start classrooms from a Systemic Linguistics Approach. *Early Childhood Research Quarterly*, 29, 231–244 doi: 10.1016/j.ecresq.2014.02.006

Zimmerman, F. J., Gilkerson, J., Richards, J. A., Christakis, D. A., Xu, D., Gray, S., & Yapanel, U. (2009). Teaching by listening: The importance of adult-child conversations to language development. *Pediatrics*, 124(1), 342–349. doi:10.1542/peds.2008-2267

79 An individual differences study on the semantic network, lexical access and reading comprehension in L1 and L2 children

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We investigated how the interconnectedness of the semantic network, i.e. knowledge of semantic relations, and speed of lexical access contribute to reading comprehension in L1 and L2 children. Studies suggest that these two components of vocabulary knowledge support successful reading comprehension, in addition to the well-established importance of vocabulary size (e.g. Nation & Snowling, 1999; Perfetti, 2007). Differences between L1 and L2 knowledge of semantic relations have been found (e.g. Cremer, 2013), which may play a role in L2 children's often delayed reading comprehension.

A priming experiment with an auditory semantic classification task probed lexical access and knowledge of semantic relations. Using the auditory modality ensured any association with reading comprehension would be due to semantic knowledge, not word decoding. Semantic classification times measured lexical access. Prime-target word pairs assessed two semantic relations: context-dependent relations, between concepts that typically co-occur (forest-squirrel), and context-independent relations, between concepts sharing intrinsic features (zebra-donkey). Based on previous research, we expected the latter to discriminate most clearly between good and poor comprehenders, and between L1 and L2 children.

122 Dutch L1 and L2 children aged 10-11 performed the task, and reading and vocabulary size tests.

Mixed effects modelling was used, including for the calculation of individual priming scores controlled for the data set's multilevel structure and variation between items. On the group level, only context-independent priming was observed. All word pairs were stringently controlled for word association strength, and we argue the absence of context-dependent priming indicates that this semantic relation relies on association. Interestingly, the L1 and L2 children performed similarly on all measures, suggesting language status may not be highly predictive of these language skills in the current Dutch context. Neither type of semantic priming, nor lexical access contributed to comprehension, highlighting vocabulary size as the most important semantic component for reading comprehension.

References

Nation, K., & Snowling, M. J. (1999). Developmental differences in sensitivity to semantic relations among good and poor comprehenders: Evidence from semantic priming. *Cognition*, 70, B1-B13.

Perfetti, C. A. (2007). Reading ability: Lexical quality to comprehension. *Scientific Studies of Reading*, 11(4), 357–383.

Cremer, M. (2013). Accessing word meaning: Semantic word knowledge and reading comprehension in Dutch monolingual and bilingual fifth-graders. Doctoral dissertation University of Amsterdam.

80 Dissociation between Structural Case and Lexical Case: Evidence from Child Turkish

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In languages that rely on heavy use of overt case markers, the path children follow in the acquisition of case, in particular whether they dissociate between structural vs. lexical case, provides a testing ground for the study of whether children rely on the syntactic positions of the NPs or the lexical properties of the verbs in determining case-relations. Though this issue appears to have received little attention in the acquisition literature, data from German (Eisenbeiss et al. 2006) and Russian (Babyonyshev 1993) suggest that structural-case is far less error-prone whereas lexical-case is used inaccurately for extensive periods of acquisition. This study examines the acquisition of case in Turkish, a language that marks the direct-object with Accusative (ACC), and the oblique-object with Ablative (ABL), Dative (DAT) or Locative (LOC), etc. Focusing only

on Accusative (-I, i.e., /i/, /w/, /y/, /u/) as an example of structural-case, and Ablative (-DAn; /dan/, /den/, /tan/, /ten/) & Dative (-A; /a/, /e/) as examples of lexical-case, this study seeks to uncover how case develops in child Turkish and whether children commit ACC-overgeneralizations in instances that require non-ACC (1a) and non-ACC-overgeneralizations in instances that require ACC (1b).

- (1) a. Çocuk *kız-ı/Vkız-a sarıldı.
'The child hugged the girl.'
child girl-ACC/ girl-DAT hugged
b. Çocuk *kız-a/Vkız-ı gördü.
'The child saw the girl.'
girl-DAT/ girl-ACC saw

By evoking case-use through picture-prompted elicited production tasks we have tested 67 children (31F, 36M; mean-age 4;11) in Experiment-1 which targeted at eliciting case in nominalized objects, the cases of which were determined by the matrix verb. Experiment-2 (30 children (11F; 8M); mean-age:4;02) elicited case in simple sentences where children were shown pictures and were expected to produce the verb and the required case-marker. We have observed high accuracy rates for structural-case and erroneous use for lexical-case in both Experiments (Table1). Furthermore, Turkish-children have defaulted to ACC (Table 2). These findings suggest that the idiosyncratic behavior of lexically-marked verbs delays the development of DAT&ABL and renders information regarding structural position more salient, which yields ACC-overgeneralizations.

Table 1. Erroneous use of case markers in Experiment-1& Experiment-2

Required Case	Experiment I (error rate%)		Experiment II (error rate%)
	G1(n=33)	G2 (n=34)	G1 (n=30)
ACC > *DAT, *ABL	7%	2.2%	0.6%
DAT > *ACC, *ABL	17%	6.8%	11%
ABL > *ACC, *DAT	22.5%	17%	5.5%

Table 2. Case overgeneralizations

	Experiment I (error rate%)		Experiment II (error rate%)
	G1(n=33)	G2(n=34)	G1 (n=30)
> *ACC overgeneralizations	9.8%	4.6%	7.2%
> *DAT overgeneralizations	3%	2.9%	0.8%
>*ABL overgeneralizations	0.9%	0.5%	1.3%

References

- Babyonyshev, M. (1993). The acquisition of Russian case system. MIT Working Papers in Linguistics 19: 1-43.
- Eisenbeiss, S., Bartke, S. & Clahsen, H. (2006). Structural and Lexical Case in Child German: Evidence from language-impaired and typically-developing children. Language Acquisition 13 (1), 3-32.

81 Nonword repetition by bilingual learners of German: The role of phonological complexity

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Monolingual children with SLI (MoSLI) often show deficits in representing and processing phonologically complex structures. To date it is unclear if bilingual children with SLI (BiSLI) show comparable difficulties regarding phonological complexity. By using a nonword repetition task, this study examines whether phonological complexity can help to identify language impairments in BiSLI children.

We constructed 66 less word-like nonwords (length 1-3 syllables, e.g. /flipuka/) using typologically widely attested sounds. The nonwords systematically increase in phonological complexity, ranging from level 2 to 10 according to the Index of Phonetic Complexity (IPC). We expected significant effects of complexity and SLI for monolingual and bilingual children. Given the construction principles of the nonwords, we did not expect an effect of bilingualism for TD children.

44 monolingual children (TD: n=39; SLI: n=5; aged 5;0-5;11 years) and 65 bilingual learners of German (TD: n=42; SLI: n=23; aged 5;0-5;11 years; different first languages) participated in the study. SLI has been diagnosed by pediatricians. The analysis considers the overall number of errors (substitutions, additions, metatheses, omissions) in children's repetitions.

Item complexity affected the error rates in all groups. Group comparisons showed significant effects of complexity (Chi-Square-Tests, MoTD vs. MoSLI: $\chi^2(48, N=2877)=453.656, p<.001$; BiTD vs. BiSLI: $\chi^2(48, N=4186)=665.29, p<.001$) and of language impairment (Mann-Whitney-U-Tests, MoTD vs. MoSLI: $z=-2.046, p=.041$; BiTD vs. BiSLI: $z=-6.499, p<.001$). Comparing TD groups, there was a significant effect of complexity ($\chi^2(48, N=5468)=863.1, p<.001$), but no effect of bilingualism ($\chi^2(6, N=5276)=9.750, p=.136$).

Consistent with our expectations, complexity and language impairment affected the overall error rates of monolingual and bilingual children. The findings suggest that phonological complexity provides an indicator of SLI in bilingual acquisition. No effect of bilingualism was found, prompting that our nonwords did not disadvantage bilingual children. Further research should examine if SLI is characterized by specific types of errors in bilingual acquisition.

82 Language and Literacy Trajectories of Spanish-English Bilingual Children Growing Up in the US

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Despite growing numbers of bilinguals entering US schools, the field's understanding of bilingual children's developmental trajectories is limited. Relatively few longitudinal studies have been conducted (e.g., Hoff et al. 2012; Mancilla-Martinez & Lesaux, 2011). This poster addresses this gap by comparing the language and literacy growth of sequential (SEs) and simultaneous learners (SILs) from kindergarten through second grade.

Participants included 70 Spanish-English bilingual children (mean age = 5.9 years); 42 were simultaneous learners (SILs; both languages from birth) and 28 were sequential learners (SEs; English introduced at age 3). Children's language and literacy skills (i.e., vocabulary, oral and reading comprehension, letter-word identification, and phonological awareness) were assessed in English and Spanish in the fall and spring of kindergarten, first and second grades. The primary language of instruction was English. Growth curve modeling was conducted with SPSS mixed models and full maximum likelihood estimation. Age in months served as a time metric and was centered on the average age at the last time point.

With regard to English development, SEs scored significantly lower than SILs in all areas, except phonological awareness and letter-word identification in English. Significant deceleration in both groups' expressive vocabulary and oral comprehension was observed overtime. Additionally, no growth was noted in phonological awareness, letter-word identification and reading comprehension standard scores; however, both groups had an average standard score of 100 or above in these areas.

In terms of children's Spanish development, SEs scored higher than SILs on all measures. Significant decreases in standard scores were observed in all areas of Spanish language and literacy. These decreases in Spanish skills were anticipated, because children were educated in English.

Hammer, C.S., Komaroff, E., Rodríguez, B., L, L., Scarpino, S., & Goldstein, B. (2012). Predicting Spanish-English Bilingual Children's Language Abilities. *Journal of Speech-Language-Hearing Research*, 55, 1251-1264.

Hammer, C.S., Lawrence, F.R., & Miccio, A.W. (2008). Exposure to English before and after entry into Head Start: Bilingual Children's Receptive Language Growth in Spanish and English. *International Journal of Bilingual Education and Bilingualism*, 11, 30-56.

Hoff, E., Core, C., Place, S., Rumiche, R., Señor, M., & Parra, M. (2012). Dual language exposure and early bilingual development. *Journal of Child Development*, 39, 1-27.

Mancilla-Martínez, J., & Lesaux, N. K. (2011b). The gap between Spanish speakers' word reading and word knowledge: A longitudinal study. *Child Development*, 82, 1544-1560.

83 Comprehension of English Subject-Verb Agreement by Spanish-English Bilingual Preschoolers

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In Mainstream American English (MAE), the use of 3rd Person Singular (3s) Subject-Verb Agreement (SVA) -s is obligatory with 3rd person subjects. In non-MAE varieties, it is optional. We explored comprehension of 3s SVA -s in low-SES monolinguals and Spanish bilinguals in the same preschools, focusing on the impact of the English variety the children are acquiring, the position of 3rd person markers and the nature of the post-verbal phrase (e.g., the boyø sleeps vs. the boys sleepø (in the bed)/(deeply)), and whether L1 morphology that impacts production (Blom et al, 2012) also affects comprehension.

English- (N=26) and Spanish-English-speaking (N=35) preschoolers (Mean Age: 4;4) were administered the DELV (Seymour et al., 2005), which categorizes children as speakers of MAE or other varieties, and an experimental video-matching task. Stimuli were s-initial English verbs (so that only the SVA marker indicated number) in the three conditions described above. Bilinguals were also administered the comprehension task in Spanish.

Only monolinguals acquiring MAE perform above chance in English comprehension across all three conditions ($p < 0.001$), which reflects their production of 3rd person singular *-s* in the DELV while monolinguals acquiring varieties that slightly or greatly differ from MAE are sensitive to the condition;

Bilinguals' performance reveals an effect of condition in English, with better results when SVA is sentence-medial followed by an adverb ($p < 0.05$) and an unclear relation between English variety, production and comprehension;

In contrast, their Spanish performance is above chance when the SVA marker is in sentence-final position ($p = 0.003$);

There was no significant correlation between bilingual children's performance in English and Spanish.

We will discuss the contributions of the context of acquisition, including of the variety of English to which monolingual and bilingual preschoolers are exposed.

References

Blom, E., J. Paradis & T. Sorenson Duncan, T. (2012) Effects of input properties, vocabulary size and L1 on the development of third person singular *-s* in child L2 English. *Language Learning*, 62, 965-994.

Seymour, H. N., Roeper, T., deVilliers, J. & deVilliers, P. (2005) *Diagnostic Evaluation of Language Variation*. San Antonio, CA: Pearson.

84 On the relation between plural marking and gender assignment in L2 German

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German has eight plural markers (*-(e)n*, *-e*, *UL + -e*, *-er*, *UL + -er*, *-s*, *-ø*, *UL + -ø*) and three gender classes (masculine, feminine, neuter). The distribution of plural markers to nouns depends partly on the gender of the noun. Despite this correlation, the (L2) acquisition of gender assignment and plural marking has mostly been investigated separately (e.g. Wegener 1995a, Wecker 2016, Binanzer 2015). Marouani (2006) has found no interdependencies in the acquisitional processes of both categories. Both gender assignment and plural marking count as difficult in L2 acquisition of German as the multiple regularities for gender assignment and plural marking come along with long lists of exceptions. Our poster addresses the question if and in what

way the two categories are co-dependent in the acquisition process of L2 German.

A cross-sectional study was conducted with 241 L2-learners of German aged eight to 17. All participants have acquired German since the age of four. The participants had to assign plural markers and gender classes to structurally identical nonce words in two different sessions in written form.

In our poster we focus on the results for nonce-words ending in *-el* and *-er*. Results show that especially younger participants with a lower length of acquisition of German prefer the plural marker *-(e)n* in both conditions. At the same time, these participants equally often assign all three genders in identical nonce-word conditions (e.g. *derMASC / dieFEM / dasNEUT* *BachterSG* *BachternPL*). On the contrary, older participants with a higher length of acquisition, use different plural markers (especially *-ø*) more frequently and prefer only one gender in respective nonce-word conditions (e.g. *derMASC* *BachterSG* *Bachter-øPL*). Thus, principles of gender assignment interact with the choice of the plural marker and the determination of a gender class for specific phonological structures seems to be the prerequisite for changing the strategy in assigning a plural marker. As a consequence, we can state that although child L2 learners of German discover the general function of plural marking prior to the function of gender assignment (Wegener 1995b), formal principles of gender assignment are required to produce systematically correct plural forms.

References

Binanzer, A. (2015). *Genuskongruenz im Zweitspracherwerb. Eine Untersuchung zum Erwerb des deutschen Genussystems durch Grundschulkindern mit türkischer und russischer Erstsprache*. Dissertation Universität Münster.

Marouani, Z. (2006). *Der Erwerb des Deutschen durch arabischsprachige Kinder. Eine Studie zur Nominalflexion*. Dissertation Universität Heidelberg.

Wecker, V. (2016). *Strategien bei der Pluralbildung im DaZ-Erwerb. Eine Studie mit russisch- und türkischsprachigen Lernern*. Berlin, Boston: De Gruyter.

Wegener, H. (1995a). *Die Nominalflexion des Deutschen – verstanden als Lerngegenstand*. Tübingen: Niemeyer.

Wegener, H. (1995b). *Das Genus im DaZ-Erwerb. Beobachtungen an Kindern aus Polen, Rußland und der Türkei*. In B. Handwerker (Ed.), *Fremde Sprache Deutsch. Grammatische Beschreibung, Erwerbsverläufe, Lehrmethodik* (pp. 1-24). Tübingen: Narr.

85 Vocabulary comprehension and production in bilingual Swedish-German preschool children

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This study investigates vocabulary comprehension and production in both languages of Swedish-German bilingual children growing up in Sweden. Studies of vocabulary in bilinguals in other countries have shown a stronger improvement with age in the majority language than in the minority language (e.g. Cobo-Lewis et al., 2002; Gathercole et al., 2013). Existing results also indicate that minority language vocabulary development may differ for comprehension and production. No such studies exist in the Swedish context.

46 Swedish-German bilinguals aged 4;0–6;11 were tested on separate occasions with the Swedish and German versions of the vocabulary test Cross-linguistic Lexical Task (CLT, Haman et al., 2015). The test contains comprehension and production of nouns and verbs. Half of the children were tested in Swedish first and the other half in German first. Test scores on the production and comprehension parts of the Swedish and German CLTs were compared and correlated with age.

The children had significantly higher scores for comprehension than production, scoring close to ceiling on comprehension in both languages. Performance was better in the majority language Swedish. The difference between the languages was larger for production. Individual variation in German production scores was high, with some children performing as well as they did in Swedish and others much lower. With age, scores on Swedish comprehension, Swedish production, and German comprehension increased significantly, but German production did not. For ages 4–6 and this combination of two closely related Germanic languages, then vocabulary comprehension develops similarly in both languages. However, vocabulary production in the minority language German does not keep pace with development in the majority language Swedish.

References

Cobo-Lewis, Alan B., Pearson, Barbara Zurer, Eilers, Rebecca E. & Umbel, Vivian C. (2002). Effects of bilingualism and bilingual education on oral and written Spanish skills in Spanish: A multi-factor study of standardized test outcomes. In: D. Kimbrough Oller & Rebecca Eilers (eds.), *Language and literacy in bilingual children* (pp. 98-117). Clevedon: Multilingual Matters.

Gathercole, V. C. M., Thomas, E. M., Roberts, E. J., Hughes, C. O. & Hughes, E. K. (2013). Why assessment needs to take exposure into account: Vocabulary and grammatical abilities in bilingual children. In: V. C. M. Gathercole (ed.), *Issues in the assessment of bilinguals* (pp. 20-55). Bristol: Multilingual Matters.

Haman, E., Łuniewska M. & Pomiechowska, B. (2015). Designing cross-linguistic lexical tasks (CLTs) for bilingual preschool children. In: S. Armon-Lotem, N. Meir, & J. de Jong (eds.) *Assessing multilingual children: disentangling bilingualism from Language Impairment* (pp. 196-240). Bristol: Multilingual Matters.

86 Fast mapping of verbs in mono- and multilingual children with and without SLI

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Multilingual children often lag behind monolinguals in one language, but also show general cognitive advantages (e.g. Leonard 2014).

Research Question 1): Does multilingualism facilitate novel word learning, in particular for (cognitively complex) action verbs?

In contrast, children with specific language impairment (SLI) have particular difficulties with verbs (ibid).

Research Question 2): Could a verb learning task detect SLI, regardless of language background? How does it compare to widely used non-word repetition tasks?

Methods

Typically developing (TD) German-speaking monolingual (n=18) and multilingual (n=12) first-graders, as well as a mixed group with SLI (n=12), participated in a computerised „alien language“ game. They learned four novel nouns (e.g. „ploom“), denoting fantasy animals, and four novel verbs (e.g. „blee“), denoting their actions. After a short training, their production and perception of these words were tested. Finally, the children repeated 16 quasi-universal (Chiat 2015) and 20 German-like (Petermann et al. 2010) non-words.

Results and conclusions

Stepwise logistic regression analyses took into account language group, word class, age, nonverbal IQ and dialect use.

RQ1) TD multilinguals produced significantly more new words correctly than monolinguals. For perception, there were no main effects, but a significant interaction between group and word class: Multilinguals performed better on verbs and monolinguals better on nouns. Thus, the multilingual advantage extends to childhood word learning, and is more evident for (cognitively more complex) verbs than for nouns.

RQ2). The children with SLI scored significantly lower than TD monolinguals and multilinguals for verbs (but, interestingly, not for nouns). However, test quality measures were low, both for production and perception, showing that the verb learning task is not (yet) clinically useful. The non-word repetition tasks scored better on test quality.

References

Chiat, S. (2015). Non-word repetition. In: Armon-Lotem, S.; de Jong, J. & Meir, N. (ed.). *Assessing Multilingual Children: Disentangling Bilingualism From Language Impairment*. Bristol: Multilingual Matters, pp. 125-150.

Leonard, L. (2014). *Children with Specific Language Impairment*. 2nd edition. Cambridge: MIT Press.

Petermann, F. (2010). Sprachstandserhebungstest für Fünf- bis Zehnjährige (SET 5-10). Untertest 10: Kunstwörter nachsprechen. Göttingen: Hogrefe.

87 Learning the sounds of a third language is easier for bilingual infants.

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There is a groundswell of evidence to suggest that bilingual infants exhibit a distinct course of perceptual narrowing, the process by which infants' perceptual systems attune to the sounds of the native environment (e.g. Ferjan-Ramirez et al. 2016; Petitto et al. 2012). When learning new words, infants are less able to learn new words distinguished by non-native contrasts. This includes contrasts that do not readily assimilate to the native phonological inventory (May & Werker, 2014), such as click sounds. The current study investigated whether monolingual and bilingual infants were able to learn novel words differing in click sounds (Ndebele). In Experiment 1, English-Mandarin bilingual and English monolingual infants were familiarized with novel words that began with a dental/lateral Ndebele click contrast at 17 to 18 months. Monolingual infants were not sensitive to the distinction between words and did not map the words contrastively onto different meanings. In contrast, bilingual infants were able to map the contrastive forms onto differ-

ent meanings. Results therefore demonstrated that bilingual infants were better able to map unencountered sounds onto meaning than their monolingual peers. In a second experiment, some limits on bilingual abilities to assimilate novel sound contrasts to newly learned words were explored. Using the same paradigm, infants were trained on novel objects labelled by non-linguistic sounds (a clap versus a finger snap). Results demonstrated that neither monolingual or bilingual infants mapped these sounds contrastively onto newly learned words. Our findings suggest that bilingual infants retain greater flexibility in the emergent phonological lexicon, but that this flexibility is not unconstrained such that it incorporates non-vocal sound contrasts. Results suggest that learning the sounds of additional languages may be enabled by bilingual exposure in infancy.

References

Ferjan-Ramirez, N., Ramirez, R. R., Clarke, M., Taulu, S., & Kuhl, P. K. (2016). Speech discrimination in 11-month-old bilingual and monolingual infants: a magnetoencephalography study. *Developmental Science*, 1-16. doi:10.1111/desc.12427

May, L. & Werker, J.F. (2014). Can a click be a word?: Infants' learning of non-native words. *Infancy*, 19(3), 281-300.

Petitto, L. A., Berens, M. S., Kovelman, I., Dubins, M. H., Jasinska, K., & Shalinsky, M. (2012). The "Perceptual Wedge Hypothesis" as the basis for bilingual babies' phonetic processing advantage: New insights from fNIRS brain imaging. *Brain and Language*, 121(2), 130-143. doi:10.1016/j.bandl.2011.05.003

88 Internal state lexicon in 30-month-old bilingual spontaneous speech

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Children's early vocabulary contains mainly concrete nouns and action words. Internal state words develop late in monolinguals' lexicon (Shatz et al. 1983), and little is known about how they develop in bilinguals. Internal state words, understood as reference to emotion, volition and cognition, play a fundamental role in children's social development (Eisenberg et al. 1998, Fusté-Herrmann et al. 2006). Research suggests that bilingual children have smaller vocabularies in each language than their monolingual peers, and different vocabularies in their two languages (Hoff et al. 2012). The present

study asked if this is also true in the domain of internal state words and, further, if monolingual and bilingual children differ in how much they talk about internal states.

We compare the internal state words used by 25 thirty-month-old bilingual children (in Spanish and English) with those used by 26 thirty-month-old English speaking monolingual children, in mother-child conversation. The bilingual children were exposed to English and Spanish from birth and participated in two 30-minute conversations (one in English and one in Spanish) with their native Spanish-speaking mothers. The monolingual children participated in a similar conversation in English. We extracted all internal state words (types and tokens in English and Spanish), referring to emotion, cognition and volition (Shiro 2016), produced by the children in those interactions.

The bilinguals did not differ from monolinguals in the size of their single language internal state lexicons—either in English or Spanish. Similarly, they did not talk less about internal states in their conversations, but they did code-switch, drawing on words from both their Spanish and English lexicons in each setting. There was also evidence of cultural differences in the frequency of talk about the different subdomains of internal state meanings. The bilingual children talked more about emotions and monolingual children talked more about volition.

References

- Eisenberg, N., A. Cumberland & Spinrad, T. (1998). Parental socialization of emotions. *Psychological Inquiry*, 9 (4), 241-273.
- Fusté-Herrmann, B., Silliman, E. R., Bahr, R. H., Fasnacht, K. S. & Federico, J. E. (2006). Mental state verb production in the oral narratives of English- and Spanish-speaking preadolescents: An exploratory study of lexical diversity and depth. *Learning Disabilities Research & Practice*, 2 (1), 44-60.
- Hoff, E., C. Core, S. Place, R. Rumiche, M. Señor & M. Parra. (2012). Dual language exposure and early bilingual development. *Journal of Child Language*, 39, 1-27.
- Shatz, M., H. Wellman & S. Silber. (1983). The acquisition of mental verbs: A systematic investigation of the first reference to mental state. *Cognition*, 14, 301-321.
- Shiro, M. 2016. The language of affect in bilingual child directed speech. In J. Perera, M. Aparici, E. Rosado & N. Salas (eds.). *Written and spoken language development across the lifespan. Essays in Honour of Liliana Tolchinsky*, pp.47-64. Amsterdam: Julius Springer.

89 How do bilingual children with language impairment distribute words? A longitudinal exploration of Zipf's Law in the narratives of Spanish-English bilingual children with and without language impairment.

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Previous research suggests that children with language impairment use fewer words and use these less frequently than their typically developing peers on narrative production tasks (Stokes & Fletcher, 2000; Stokes et al., 2010). This study aimed to further explore the differences between children with and without language impairment on word use and word frequency over time using the principles of Zipf's Law (Zipf, 1949). Specifically, we examined the pattern of word frequency distributions in the telling and retelling of oral stories in both Spanish and English by 15 Spanish-English bilingual children identified with primary language impairment (PLI) and 15 age, sex, and non-verbal IQ matched typically developing (TD) peers. Participants were tested in their kindergarten and first grade years.

Children with PLI used fewer words overall across samples, in keeping with past research. Preliminary chi-squared analyses of the distribution of high frequency words showed significant differences between the two groups in both Spanish and English at the Kindergarten level. Children with language impairment showed a significantly flatter Zipfian curve, indicating that they used their most frequent words less efficiently than typically developing children. By first grade, however, the differences between the two groups became far less pronounced, with children with PLI showing a steeper Zipfian curve that was not significantly different from the TD group. These findings suggest that the pattern of word acquisition in bilingual children with language impairment is more idiosyncratic than that of their typically developing peers, leading to decreased semantic efficiency. Over time, however, these children make vocabulary gains that increase the efficiency of their semantic systems. These findings provide implications for the assessment and treatment of word use in the population of children with language impairment.

References

Stokes, S. F., & Fletcher, P. (2000). Lexical diversity and productivity in Cantonese-speaking children with specific language impairment. *International Journal of Language & Communication Disorders*, 35(4).

Stokes, S. F., Kern, S., & Dos Santos, C. (2012). Extended statistical learning as an account for slow vocabulary growth. *Journal of Child Language*, 39(01), 105-129.

Zipf, G. K. (1949). *Human Behaviour and the Principle of Least Effort*. Reading, MA: Addison-Wesley Publishing Co.

90 First (L1) and second language (L2) performance in typically developing and language impaired children (HeISLI study)

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Previous research shows substantial differences in language performance between monolinguals and sequentially bilinguals when using tests developed for monolinguals (Verhoeven et al., 2011). However, age and exposure effects have been rarely considered simultaneously in these analyses. The aim of the present study is to clarify how typically developing (TD) and language impaired (LI) sequentially bilingual (Bi) children perform in their second language (L2), when comparing to monolinguals (Mo) and considering age and exposure effects. At the moment, there is no previous research on LI in multilingual setting in population with immigrant background, highly agglutinating Finnish from Finnic languages being L2.

Finnish speech comprehension on sentence level and receptive and expressive vocabulary of mono- and bilingual TD- and LI children were assessed in Finnish. Cross-sectional data were analysed and comparisons for groups MoTD, BiTD, MoLI and BiLI were made using general linear model and including in the final model all the significant interactions.

Monolinguals outperformed bilinguals, and, to some extent, BiTD children performed similarly

to MoLI children. The effects of exposure seem to be parallel in TD and LI children when considering receptive vocabulary. In expressive vocabulary tasks and sentence level comprehension task, however, development for the LI children varied more with exposure. Age also affected differently when comparing TD and LI children. Benefits of long exposure were more pronounced in older children.

Childrens' performance when Finnish being L2 is in line with the earlier research and it can be concluded that monolinguals are not a well suited comparison group for sequentially bilinguals. Age and exposure effects are somewhat different in TD and LI children, but also depending on a task type. Tentative result is that receptive tasks might be better in differentiating LI in bilingual setting. This was seen on both sentence level and vocabulary.

References

Verhoeven, L., Steenge, J., van Weerdenburg, M. & van Balkom, H. (2011). Assessment of second language proficiency in bilingual children with specific language impairment: A clinical perspective, 32, 1798-1807.

91 Narrative skills in two languages of Mandarin-English bilingual children

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We studied narrative skills in two languages of Mandarin-English (ME) bilingual children and cross-linguistic interactions of these skills. We also explored the correlations between language learning contextual factors (i.e. age, language experience and vocabulary) and narrative skills. Twenty-one ME bilingual children (mean age 7;10) produced two narratives in each language. Narrative evaluations included macrostructure and microstructure analyses. Vocabulary was measured using picture identification and naming. Language experience was collected by a parent questionnaire and entered as a covariate.

A repeated measures analysis of covariance revealed that ME bilingual children demonstrated equal performance across languages on macrostructure but higher microstructure in English than Mandarin. There was a stronger cross-linguistic correlation for macrostructure than microstructure in children with high Mandarin vocabulary but no

significant correlations were found in children with low Mandarin vocabulary. Vocabulary was strongly correlated with narrative skills. Age correlated with narrative skills in English but not Mandarin.

ME bilingual children displayed better microstructure skills in English than Mandarin. Macrostructure may be more transferrable between languages than microstructure once bilingual children reached a threshold of vocabulary proficiency. Adequate vocabulary is required for telling complex stories. Reduced opportunities to hear and use Mandarin in the community may limit children's ability to acquire Mandarin narrative skills.

92 Cancelled

93 Gesturing literal and metaphorical motion events in children and adults

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The question as to how metaphors arise in thought and how they are interpreted in communication is a long-standing question from Aristotle to contemporary psycholinguists. For some, metaphors should be analyzed as analogies in order to receive meaning; that is, literal meaning is initially imposed (decomposition), and the choice of the metaphor is triggered only when the literal analysis fails (Searle, 1979; Gentner & Bowdle, 2008). For others, metaphors are stored as separate lexical items and interpreted via direct access (Giora, 2008; McElree & Nordlie, 1999). We address this question by focusing on how literal and metaphorical motion events are interpreted in Turkish children (N = 24; MeanAge = 4;5) and adults (N = 46). Literal motion event, "run into house", depicts a physical motion of an object whereas a metaphorical motion event, "run into frustration", does not (Özçalışkan, 2004). Özçalışkan (2007) observed children impose literal meaning to metaphorical concepts in their verbal descriptions until age 5. The test was in the speech modality so children's limited language skills might have led to such an effect. We conducted an act-out study where the participants were asked to describe the motion events whispered in their ears by an experimenter in gestures (without speech). Children were more likely to have null-responses for metaphorical (36.11%) compared to liter-

al (4.86%) motion events. Both adults and children applied decomposition in the literal motion events (children = 100%; adults = 97.8%) significantly more than they did in the metaphorical events (children = 28.9%; adults = 4.3%) (children = $\chi^2(1)=62,5$; $p = .00$; adults= $\chi^2(1)=241,2$; $p = .00$). In metaphorical events, children were more likely to have decomposition compared to adults ($\chi^2(1)=9.09$; $p = .002$). Children were more likely to decompose when they did not know the meaning of the term (11.11%) compared to the cases when they knew the meaning (6.94%). Similarly, they were more likely to give direct description of the event when they knew the meaning (41.6) compared to the cases where they did not (4.16%). We also looked at to what extent participants used ground elements (source and goal) in their gestures. Both groups used these elements in literal motion events (children = 84.1%; adults = 97.6%) more than they did in the metaphorical expressions (children = 25.6%; adults = 2.2%) (children = $\chi^2(1) = 31,8$; $p = .00$; adults = $\chi^2(1) = 200,7$; $p = .00$). Although not fully adult-like, children already begin interpreting metaphors without decomposition at age 4. Just like adults, children have a direct access to the metaphors especially if these metaphors are part of their lexicon.

References

Gentner, D., & Bowdle, B. (2008). Metaphor as structure-mapping. In R. Gibbs (Ed.) *The Cambridge Handbook of Metaphor and Thought* (pp. 109-128). New York, NY: Cambridge University Press.

McElree, B., & Nordlie, J. (1999). Literal and figurative interpretations are computed in equal time. *Psychonomic Bulletin & Review*, 6(3), 486-494.

Özçalışkan, Ş. (2004). Typological variation in encoding the manner, path, and ground components of a metaphorical motion event. *Annual Review of Cognitive Linguistics*, 2(1), 73-102.

Özçalışkan, Ş. (2007). Metaphors we move by: Children's developing understanding of metaphorical motion in typologically distinct languages. *Metaphor and Symbol*, 22(2), 147-168.

94 Perception of Fricative contrasts by children with and without phonological disorder

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In the literature, there is not consensus about the exact nature of the relationship between speech perception and phonological disorders. On the one

hand, some authors assume that children's perception of speech sounds is a critical variable influencing the manner in which those sounds are produced (Bird & Bishop, 1992; Broen, Strange, Doyle, & Heller, 1983); on the other hand, others authors assure that there is little evidence to support the connection that children with PD are deficient in the ability to perceive the speech sounds (Stark and Tallal, 1988).

The current study attempted to clarify the relationship between speech perception and phonological disorders comparing the perceptual performance in children with and without phonological disorder (PD) on the fricative identification task.

A forced-choice minimal-pair identification task involving the six fricatives in Brazilian Portuguese was conducted with 54 children (27 with PD and 27 controls of matched age and gender), using PERCEVAL software. The stimuli used in the identification task consisted of a typical adult's recordings of the familiar disyllabic words (minimum pairs) contrasting the fricative sounds. The acoustic stimulus was presented by children and they needed to choose which stimulus-correspondent picture was shown on the computer screen. Both presentation time and reaction time of the stimulus were measured by PERCEVAL software.

The Kruskal-Wallis ANOVA didn't show significant differences between children with and without PD, comparing perceptual accuracy (% of correct and incorrect responses) and reaction time for the correct and incorrect responses. These results suggesting that perceptual performance may not contribute directly to production difficulties.

References

- Bird, J., & Bishop, D. (1992). Perception and awareness of phonemes in phonologically impaired children. *European Journal of Disorders of Communication*, 27, 289–311.
- Broen, P. A., Strange, W., Doyle, S. S., & Heller, J. H. (1983). Perception and production of approximate consonants by normal and articulation-delayed preschool children. *Journal of Speech and Hearing Research*, 26(4), 601–608.
- Stark, R. E., & Tallal, P. (1988). *Language, speech and reading disorders in children: Neuropsychological studies*. San Diego, CA: CollegeHill Press.

95 How semantic organization of information in Long Term Memory (LTM) influences Working Memory (WM) recall in children from 6 to 12 years

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The WM is a limited capacity system storing and manipulating information. The stimulus mental organization (chunking) improves the information recall (Mathy & Feldman, 2012)

The semantic system can be distinguished in thematic (complementary) and categorical (based on analogy) relationships. The routine application of the categorical relationships begins around 7 years (Nelson, 1996). The impact of categorical and thematic links on the WM is still scarcely known.

Five hundred thirty six participants (52% Males) of 5 age groups (average in years and months): 6;6, 7;11, 9;2, 10;8; 12;10- were submitted to a WM double task: 60 lists of 4 familiar words balanced for categorical (20), thematic (20) and arbitrary (20) links. The stimuli were arranged into sets containing an increasing number of lists; the children had to recall from 2 to 6 words, and three trials were run for each set. They were asked to listen to the words, to tap whenever they heard a digit and, after each set, to recall the last word of each list.

A mixed Anova on word recall with Links as within factor and Groups as between factor showed an effect of Link: the categorical link improved word recall more than the thematic and the arbitrary ones, and of Group: the recall scores increased significantly from 6 to 12 years. An interaction Group x Link emerged: a significantly increasing recall of categorical links was observed starting from the second age group.

This study showed a positive age related influence of LTM semantic system on WM, with a stronger role of categorical organization.

References

- Mathy, F., & Feldman, J. (2012). What's magic about magic numbers? Chunking and data compression in short-term memory. *Cognition*, 122, 346–62. doi:10.1016/j.cognition.2011.11.003
- Nelson, K. (1996). *Language in Cognitive Development: The Emergence of the Mediated Mind*. Cambridge, UK: Cambridge University Press.

96 Children's Understanding of Gradable Adjectives; Are Emotions Relative or Absolute?

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Gradable adjectives (GAs) express a relation to an ordered, scalable concept -- e.g., height, length, intensity of emotion. GAs come in two types, absolute and relative. Application of relative adjectives (e.g., "long") varies with the comparison set. Asked to pick out all the «long» pencils, our criterion changes if the set includes more very long pencils. Absolute GAs are independent of the immediate context. Asked to pick out all the "striped umbrellas» from a set of pictures, our criterion doesn't change if the comparison set is «seeded» with more umbrellas with many stripes. Barner and Snedeker (2008) demonstrated that four-year-olds were sensitive to this semantic property of relative adjectives. Children's criterion for "tall" changed with variations in the average height of the comparison set of objects. No prior studies have investigated whether emotion adjectives behave this way.

With morphing software we created graded picture sequences of people expressing happy, sad and angry. Ratings by adults produced linear 9-picture sequences scaled for intensity of each emotion. As part of a sorting game, twenty-six 4- to 5-year-old children sorted 9 sets of pictures or objects on the basis of an emotion or a physical property, e.g. "all the happy faces», «all the striped umbrellas», or «all the long pencils». Stimulus sets either had 9 items varying in intensity/extension or those 9 plus 4 additional stimuli of maximal intensity/extension. Just like adults, the children treated the emotion adjectives as relative GAs (like "long") and clearly distinguished them from the absolute GAs ("striped" and "spotted"). For each of the emotion sequences the children's criterion shifted towards the maximal intensity for the enriched sets ($p < .02$ for each sequence), as it did for "long". Their criterion was unchanged for the absolute GAs. So 4-year-olds are sensitive to the semantics of GAs across types of property.

References

Barner, D. and Snedeker, J. (2008). Compositionality and statistics in adjective acquisition: 4-year-olds interpret tall and short based on the size distributions of novel noun referents. *Child Development*, 79, 594-608.

97 Empirical evidence in favor of continuity from gesture to sign: A comparison between deaf and hearing children labeling pictures

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The presence of gestures across-cultures and the existence of languages that are strongly based on overt actions (sign languages) underline the embodied nature of human communication.

Previous studies comparing hearing persons' gestures with signs produced by older children or adults indicated that interesting similarities as well as important differences could be found. In particular, Pettenati et al. (2010), analyzing the gestures produced by Italian hearing children during a picture naming task (the PinG test; Bello et al., 2010), found similarities between the motor characteristic of representational gestures and the production of first signs, as reported in the sign language acquisition literature.

The aim of this study is to compare gesture and/or sign production in hearing children and deaf signing children, using the same picture naming task (i.e. PinG) in order to address the following questions: are gestures/signs similar/consistent within the hearing children group and within the deaf signing group? Are motoric constraints in forms taken by gestures similar to those present in forms taken by signs?

The PinG test was administered to 41 Italian hearing children and 12 Italian deaf children (age range 25-57 months). Five pictures depicting objects and five pictures depicting actions were chosen for more detailed analysis and each sign/gesture was analyzed in terms of: number and type of hands employed, handshapes, locations, place of contact, type and direction of movement. Results show a high consistency in the form of gestures/signs produced by hearing and by deaf children. Furthermore, some of the gestures produced by hearing children look very similar to the signs chosen by deaf children to label the same referents: Gestures and signs were both produced using similar locations, movements and handshapes.

These findings support continuity between co-speech gestures produced by hearing children and early signs produced by children exposed to a sign language.

References

Bello, A., Giannantoni, P., Pettenati, P., Stefanini, S., & Caselli, M. C. (2012). Assessing lexicon: validation and developmental data of the Picture Naming Game (PinG), a new picture naming task for toddlers. *International journal of Language & communication disorders*, 589-602.

Pettenati, P., Stefanini, S., & Volterra, V. (2010). Motoric characteristics of

representational gestures produced by young children in a naming task. *Journal of Child Language*, n. 37 (4), 887-911

ZONE 1

01 Comprehension of wh-questions in German speaking children and adolescents with Down syndrome

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Introduction

Children with Down syndrome (DS) have pronounced deficits in understanding complex syntactic structures, e.g. passive sentences (cf. Perovic, 2006; Ring & Clahsen, 2005). Ring & Clahsen attribute these difficulties to a qualitative syntactic deficit in the formation of binding chains that is independent from their intellectual disability. We investigate the comprehension of wh-questions in German subjects with DS to find out if such a deficit also extends to other syntactic dependencies like wh-movement (or A' construction) as suggested by a study by Joffe & Varlokosta (2007) with English speaking children with DS.

Method

We conducted a picture-pointing task with 33 children and adolescents with DS and a control group of 26 typically developing (TD) children matched on mental age (MA) (DS: mean chronological age (CA) 10;11 years, mean MA 4;7 years; TD: mean CA: 3;11 years, mean MA: 4;2 years). Subjects had to point to one of two persons in a picture to answer 20 who-subject respectively who-object questions (e.g. 'Who is brushing the boy?').

Results

Children with DS differed significantly from the control group (2-way ANOVA, $p = 0.013$). While 20 subjects with DS have mastered the comprehension of who-questions in this task (97% correct overall), 13 subjects show severe deficits with one or both question types (49% correct overall). The error analysis reveals similar patterns and stages as in younger TD subjects, e.g. a better performance for subject questions than for object questions.

Conclusion

A substantial proportion of children/adolescents with DS displayed deficits in comprehending wh-questions (A' constructions) and lag behind TD children with comparable or younger mental ages. This subgroup displays evidence for an additional deficit in language development which is independent of their cognitive delay. We will discuss to what extent factors like phonological working memory skills contribute to their language outcome.

References

- Joffe, V., & Varlokosta, S. (2007). Patterns of syntactic development in children with Williams syndrome and Down's syndrome: Evidence from passives and wh questions. *Clinical Linguistics & Phonetics*, 21(9), 705–727.
- Perovic, A. (2006). Syntactic deficit in Down syndrome: More evidence for the modular organisation of language. *Lingua*, 116, 1616–1630.
- Ring, M., & Clahsen, H. (2005). Distinct patterns of language impairment in Down's syndrome and Williams syndrome: The case of syntactic chains. *Journal of Neurolinguistics*, 18(6), 479–501.

02 Language and analogical reasoning in children with Specific Language Impairment: The effect of articulatory suppression

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Analogical reasoning shares a mutual influence with language development: analogical reasoning is improved by labelling analogical items with words describing the relations that they contain. Conversely, structural alignment, a core mechanism of analogical reasoning, allows the acquisition of novel words and the development of grammar (Gentner, 2010). Given those findings, some authors have taken interest in the analogical reasoning ability of children with language disorders, and specifically of children with Specific Language Impairment (SLI). Those children have worse performance than their age-matched peers without language disorders in linguistic or non-linguistic analogical tasks (Leroy, Maillart, & Parisse, 2014). Our aim here is to see if this weakness is due to their language disorders and if they use the same verbal strategies as their peers to solve an analogical task. To experience these assumptions, we use a perceptu-

al analogical task following an A:B::C:D paradigm: participants have to find the relation between two geometric forms A and B and to apply it to the C term in order to find the D term among distractors. The distractors either share perceptual features with the C term, what creates a competition that shall be inhibited, or not. Moreover, children are faced with three interfering task conditions: one without any interfering task, one with an articulatory suppression secondary task and one with a tapping secondary task, which is used in order to measure the general dual task demands. Comparing the results of these conditions will allow us to evaluate the impact of language and verbal strategies on analogical reasoning in control and SLI children. Twenty children with SLI from 8 to 12 years old are matched with age control children on the one hand, and with language control children on the other hand.

References

Gentner, D. (2010). Bootstrapping the mind : Analogical processes and symbol systems. *Cognitive Science*, 34, 752–775.

Leroy, S., Maillart, C., & Parisse, C. (2014). Analogical mapping across modalities in children with specific language impairment (SLI). *Research in Developmental Disabilities*, 35(9), 2158–2171.

03 Investigating silent letter production and morphological awareness skills in children with SLI: a window into derivational morphology

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This study describes the production of derivational silent letters and morphological awareness (MA) skills in children with Specific Language Impairment (SLI) and typically developing (TD) children. In French, silent letters are inconsistent and usually occur at word endings. Studies indicate that good MA skills help choosing appropriate silent letters when producing a derivation (e.g.: lait–laitier)¹. Only a handful of studies target MA skills in SLI children; even less analyze their ability to spell derivational silent letters. Considering their lack of sensitivity to derivational relations², and their propensity to omit spelling grammatical morphology marks³, we hypothesized that SLI children will have more difficulty with derivational silent letters.

This study compares the production of derivational silent letters and establishes links with MA skills in children with SLI and in TD children. SLI children (n=16) of 7 to 9 year-old were compared to TD children (n=16) of 7 to 8 year-old. Each child was tested on MA skill measures (morphological judgment task, and morphological production task) and on word dictations, on three occasions during the school year.

Concerning the MA skill measures, the SLI group consistently scores significantly lower on the morphological production task and produces more errors. These errors show a bigger focus on semantic aspects rather than on derivational rules (e.g.: The one who illustrates is an... “artist”, instead of “illustrator”). Concerning word dictations, both groups are producing a similarly high number of errors. We observe that TD children try more frequently to add silent letters at the end of words.

Our results highlight the relation between MA skills and silent letters production. TD children benefit from their derivational morphological knowledge to properly produce silent letters, whereas SLI children focus on phonological transcription and are unable to apply derivation rules when spelling.

References

Pacton, S. (2005). Utiliser les informations morphologiques à l’écrit : pourquoi, qui, quand, comment?. *Rééducation orthophonique*, 223, 155-175.

Ravid, D., Levie, R. & Avivi Ben-Zvi, G. (2004). Morphological disorders. In L. Verhoeven & H. van Balkom (Eds.), *Classification of developmental language disorders* (pp. 171-196). Mahwah: Erlbaum.

Mackie, C. J., Dockrell, J. & Lindsay, G. (2013). An evaluation of the written texts of children with SLI: The contributions of oral language, reading and phonological short-term memory. *Reading and Writing*, 26 (6), 865-888.

04 Phonological awareness in typically developing and low risk preterm children.

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Phonological awareness has been considered an important predictor of literacy. Different investigations found that very or extremely (high risk) preterm children show global (Sansavini et al., 2008; Wolke & Meyer, 1999) or specific (Guarini et al., 2010) difficulties in phonological awareness (PA). Do low risk preterm children, however, exhibit this pattern? The

aims of this presentation are 1) to compare PA in low risk preterm children to that of full term children, as well as 2) to analyze which factors predict PA. In the search for predictors we paid special attention to different linguistic abilities (vocabulary understanding, comprehension of syntax and morphosyntactic production), cognition, executive functions (working memory and inhibition), gestational age (GA) and socio-demographic variables. The participants were 108 low risk preterm children, classified into 3 groups of different GAs, and 33 full-term children 5 years old. The children were assessed when they were 4 and 5 years of age with standardized tests in Spanish. The results show that there is no significant difference in PA between PR and FT children. Multiple regression analysis indicates that cognitive ability, morphosyntactic production ability and working memory contribute in a significant way to explain PA. No other linguistic abilities (word or grammar understanding) seem to have any effect on PA. Nor is there any effect of GA on PA. These results are discussed in relation to previous studies.

References

Guarini, A., Sansavini, A., Fabbri, C., Savini, S., Alessandroni, R., Faldella, G., et al. (2010). Long-term effects of preterm birth on language and literacy at eight years. *Journal of Child Language*, 37(4), 865-885. doi: 10.1017/s0305000909990109

Sansavini, A., Guarini, A., Savini, S., Alessandroni, R., & Faldella, G. (2008). Relations between phonological short-term memory and language at 3½ and 6 years in typically developing and preterm children. In N. B. Johansen (Ed.), *New Research on Short-Term Memory* (pp. 241-265). Hauppauge, NY: Nova Science Publishers, Inc.

Wolke, D., & Meyer, R. (1999). Cognitive status, language attainment, and prereading skills of 6-year-old very preterm children and their peers: the Bavarian longitudinal study. *Developmental Medicine and Child Neurology*, 41(2), 94-109.

05 Prosodic aspects of word and nonword repetition in Swedish children with language impairment

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Children's ability to repeat nonwords correlates with grammatical and lexical skills, and has potential as a clinical marker for language impairment. Nonword repetition is a complex task, tapping several linguistic abilities. Repetition performance is influenced by various properties of the non-words.

The role of prosodic features in repetition has not been extensively investigated, but both stress and intonation seem to be at play. Swedish lexical prosody is relatively complex, and it is characterized by variable stress and the contrastive use of tonal word accents. In this cross-sectional study, segmental and prosodic aspects of word repetition and nonword repetition, as well as the relation to other linguistic and cognitive abilities, were investigated. Twenty-nine monolingual Swedish-speaking children with language impairment (LI) and 19 typically developing (TD) controls between four and six years of age performed a prosodically controlled repetition task, along with tests of receptive vocabulary, grammatical production, phonology, lexical access and nonverbal ability. The children with language impairment performed below their typically developing peers on all repetition measures, the largest differences being for repetition of consonants and stress patterns respectively. About 9% of all unstressed syllables were omitted by the children with LI in words and nonwords alike, with syllables in prestressed positions being twice as likely to be omitted as those in poststressed positions. There was also a correlation between the ability to repeat stress patterns and grammatical production. Thus, problems repeating prosody might be an indicator of grammatical difficulties. In conclusion, prosody plays a role in immediate repetition of both known and unknown words, and attention should be paid to prosody in the interpretation of children's performance on repetition tasks.

06 Application of ICF-CY in the screening of Iranian children with primary language impairment (PLI)

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Due to the lack of standardised language assessments in speech therapy clinics in Iran for accurately assessing children with PLI (specified with unknown etiology for language impairment), this study sought to determine the extent of compatibility of Iranian clinicians'-made assessments with the WHO's ICF-CY framework and with evidence-based diagnostic fundamentals. ICF-CY framework describes children's health status within several domains including body structures/functions, participation, activities, environmental, and individual factors. The second goal was to suggest an evidence-based screening protocol for children suspected as being PLI within the framework of ICF-CY.

The study was a mixed qualitative-quantitative one. The assessment profiles of children with PLI who had been visited by speech therapists (STs), were screened retrospectively to be further analysed and extracted those major themes that Iranian STs examine during a routine assessment. The other source of extracting the themes was through a questionnaire interview with 30 STs asking their way of the assessment of PLI which was obtained from a study by Kazemi (Kazemi, 2013). The pooled themes were compared to ICF-CY codes and evaluated against the criteria of an evidence-based diagnosis by seven qualified STs in a focus group, prospectively. In the last phase of the study this evidence-based ICF-CY-compatible screening was piloted on three children who were suspected as being PLI. Content analysis was used as the main procedure of data analysis. Of all themes of ICF-CY, 178 themes were identified as “eligible” themes to be considered in the screening protocol of PLI. The focus group confirmed 16 out of 22 themes as “essential” to be allocated in the protocol.

The majority of assessment domains applied by Iranian STs to screen children with PLI conform to ICF-CY themes and codes. Three themes took the main role in the process of diagnosing PLI including “child’s medical history”, “parents’s report of communication interactions”, and “informal assessment by the clinician”. If the concern arises, a 20-minute language sample analysis is essential to confirm the child’s language condition (Kazemi, Klee & Stringer, 2015). Our protocol is ready to be empirically assayed to find its feasibility in identifying children with PLI and to investigate whether using this protocol would assist to intervene more efficiently compared to when we have no consensus relating to the identifying children with PLI.

References

Kazemi, Y. (2013). Clinical Assessment of Persian-speaking Children with Language Impairment in Iran: Exploring the potential of language sample measures (Unpublished doctoral dissertation). Newcastle University, Newcastle upon Tyne.

Kazemi, Y., Klee, T., Stringer, H. (2015). Diagnostic accuracy of language sample measures with Persian-speaking preschool children. *Clinical Linguistics & Phonetics*, 29 (4), 304-318.

07 Pragmatic inferences in children with autism spectrum disorder: using prosodic and contextual clues

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This study explored autistic children’s pragmatic inference; we especially focused on indirect answers speakers give instead of clear responses to a question (Holtgraves, 1998). For example, suppose that a person who is asked whether (s) he would like coffee answers as follows: “Coffee keeps me awake.” (cf. Sperber & Wilson, 1986: 34) Hearers need to use contextual information (e.g. whether the person wants to sleep or stay awake) to reach the speaker meaning. Another focus of this study is how prosodic features (e.g. positive/negative tone of voice) influence their inference. Past studies have tested various types of figurative languages but never examined these issues. In order to work through the questions, the inference task was conducted on children with autism.

Participants between 6 and 12 years of age were presented with picture stories ended with an indirect answer to a polar question. The respondent’s intended meaning (positive/negative) can be derived from either of the two clues: contextual or prosodic clues. After hearing the stimuli utterance, children were asked to give the following information: (1) the speaker’s implied meaning (yes/no) and (2) the reasons for their choice (free answer).

When given a contextual clue, autistic children derived the speaker’s meaning as well as the control group. However, when the answer was prosodically biased to one side but had no contextual information available, they performed worse than the control group. Furthermore, autistic children were more likely to fail to give a reflective report, being less aware of what kind of clues helped their own inference.

These results imply that autistic children may become confounded by indecision when they have no sufficient contextual information, even if there are other types of clues available, like prosody. Raising their awareness of the process of inference could possibly contribute to their better understanding of these expressions.

References

Holtgraves, T. (1998). Interpreting indirect replies. *Cognitive Psychology*, 37(1), 1-27.

Sperber, D and Wilson, D. (1986). *Relevance. Communication and Cognition*. Oxford. Blackwell

08 Exploring statistical learning of meaning-based regularities in children

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Studies on language acquisition have shown that both children and adults are able to exploit statistical cues provided by the linguistic input to learn rule-like regularities. This line of research has produced convincing evidence that humans can make use of surface-based information to learn non-adjacent dependencies or probabilistic rules (Newport, 2016). Furthermore, research with adults has found that they are also capable of utilising higher-level contingencies, e.g. semantic variables, to associate novel non-words with known words without awareness of underlying combinatorial rules (Leung & Williams, 2014); however, no such study has been attempted with children. This project seeks to explore whether children are able to learn a semantic-based rule using a task in which there are no overt markings signalling the regularities, nor explicit instructions about the rule.

Twenty-four 9-11 year olds participated in an implicit rule-learning task presented as a computerized game. They were exposed to pairs of known words each paired with one of four novel non-words. They were taught that half of the novel non-words meant 'near' and the other half meant 'far', but were unaware that one set of near/far words occurred only with animate nouns while the other only with inanimate. During exposure, the children were presented with novel-known word pairings and were asked to indicate the animacy of the known word and the distance of the novel word. The responses were made using a keyboard and their reaction times were recorded. The testing phase was identical to exposure, but the pairings now included both trials that followed the hidden rule (controls) and trials that did not (violations). Subsequent statistical analyses showed that participants were slower on the violation trials, indicating sensitivity to the hidden rule.

These results extend the current literature by showing that children, like adults, are capable of implicitly learning more than simple surface-based associations.

References

- Newport, E. L. (2016). Statistical language learning: computational, maturational, and linguistic constraints. *Language and Cognition*, 8(3), 447-461.
- Leung, J. H. C., & Williams, J. N. (2014). Crosslinguistic Differences in Implicit Language Learning. *Studies in Second Language Acquisition*, 1-23.

09 Reading Skills and Pitch Perception in Dutch High-school Students

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Dyslexic children do not only suffer from reading problems, but also from auditory perception deficits (2). Past research in English (1) and French (3) has shown a link between pitch perception and reading skills, including reading impairments like dyslexia. Since the precise nature of this effect remains unclear and the effect seems to be language-dependent, this study investigates reading skills and pitch perception in Dutch readers. In an experimental study with 56 first and fifth grade monolingual Dutch high-school students we explored the link between pitch perception and reading skills. Pitch perception was measured both on a local level (i.e. the actual pitch values over time), and on a global level (i.e. the overall contour of the pattern). The pitch perception task was based on previously used methods (1,2). Reading skills were measured with two standardized tests measuring word and pseudo-word (pronounceable non-words) reading speed and accuracy.

The results showed that in the first-grade students, global pitch perception correlated significantly with pseudo-word reading ($p < .05$) and marginally significant with word reading ($p < .10$). Interestingly, for the fifth-grade students there were no significant correlations between reading skills and pitch perception. These findings are in line with earlier findings for English readers (1), but not with French children who showed a link between local pitch perception and reading (3). An explanation could be that the first study tested skilled readers, as in the current research, whereas the latter tested dyslexic, poor readers. In conclusion, there seems to be a developmental pattern in the relationship between reading skills and pitch perception, which is also confirmed by earlier research with Dutch beginning readers.

References

- Foxton, J. M., Talcott, J. B., Witton, C., Brace, H., McIntyre, F., & Griffiths, T. D. (2003). Reading skills are related to global, but not local, acoustic pattern perception. *Nature Neuroscience*, 6, 343-344.
- Goswami, U., Mead, N., Fosker, T., Huss, M., Barnes, L., & Leong, V. (2013). Impaired perception of syllable stress in children with dyslexia: a longitudinal

study. *Journal of Memory and Language*, 69, 1-17.

Ziegler, J. C., Pech-Georgel, C., George, F., & Foxton, J. M. (2012). Global and local pitch perception in children with developmental dyslexia. *Brain and Language*, 120, 265-270.

10 Improving Working Memory in Children with Language Difficulties

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Training interventions have recently produced reliable gains in working memory skills for typically developing children (Henry, Messer & Nash, 2012). Henry et al. (2012) found that those in a trained group showed significantly larger gains than controls in two trained executive loaded working memory tasks (Listening Recall and Odd One Out Span) and two untrained working memory tasks (Word Recall and Counting Recall) with effects still evident at 6 month follow up. Significant gains were also present within the trained group for reading comprehension, still evident at 12 month follow up. An intervention that strengthens ability to divide attention between processing and storage may, therefore, have a specific benefit for reading comprehension.

Children with language impairments commonly demonstrate a deficit in working memory ability (Montgomery, Magimairaj & Finney, 2010). With the beneficial effects of working memory training commonly debated, the current research will assess whether improvements in working memory ability found via interventions with typically developing children can be replicated for those with language difficulties (Melby-Lervag, Redick & Hulme, 2016).

Up to 100 children, aged 6-11 years, with language difficulty as a primary need, will be randomly allocated to a working memory intervention or an active control group. Working memory training will involve 18, 10-minute training sessions, over a 6-week period focusing on the Listening Span Task and Odd One Out Span Task. Children will be assessed at pre-intervention, post-intervention and

12-month follow up via outcome measures of working memory ability, sentence comprehension, reading comprehension, reading accuracy and receptive grammar. Preliminary pre and post intervention results will be discussed to assess the presence or absence, scope, and maintenance of training gains.

References

Henry, L. A., Messer, D. J., & Nash, G. (2014). Testing for near and far transfer

effects with a short, face-to-face adaptive working memory training intervention in typical children. *Infant and child development*, 23, 84-103.

Melby-Lervåg, M., Redick, T.S. & Hulme, C. (2016), Working Memory Training Does Not Improve Performance on Measures of Intelligence or Other Measures of "Far Transfer": Evidence from a Meta-Analytic Review, *Perspectives on Psychological Science*, 11 (4), 512-534.

Montgomery, J. W., Magimairaj, B. M., & Finney, M. C. (2010). Working memory and specific language impairment: an update on the relation and perspectives on assessment and treatment. *American Journal of Speech-Language Pathology*, 19, 78-94.

11 Linguistic-communicative skills and emotion understanding: Insights from deafness

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Several studies have shown that language is important for the development of sociocognitive skills, and particularly, for emotion understanding, so deaf children with linguistic difficulties might have social understanding delays (see, for example, Peterson, Wellman, & Slaughter, 2012). In this regard, the present study compares the influence of linguistic-communicative skills between deaf and hearing children, at different developmental points, in both the capacity to recognise emotions from faces and the capacity to understand pretend emotions.

The sample consisted of 173 children (91 hearing and 82 deaf) aged between 39 and 107 months (mean = 72.43 months). Participants were administered the following tasks: expressive vocabulary, non-verbal reasoning, facial emotion recognition, and understanding of pretend emotions. Moreover, speech therapists and teachers responded to a

questionnaire with sociodemographic and audio-logical data, as well as a profile of linguistic-communicative skills (LPP-2; Bebko & McKinnon, 1993).

Results show a delay in deaf children's capacity to both recognise basic emotions (although not in all of them) and to understand pretend emotions. On the other hand, expressive vocabulary and linguistic-communicative skills (all the aspects regarded in the LPP-2) showed significant correlations with both tasks of emotion understanding (even after controlling the participants' age). These correlations were much stronger for the deaf group than for the hearing group. Furthermore, the importance of the different linguistic and communicative skills for social understanding varied throughout development.

Our results support the view that different linguistic and communicative skills are important for the development of emotion understanding (Dyck, Farrugia, Shochet, & Holmes-Brown, 2004), which is especially relevant in the case of children with deafness. The way in which several linguistic and communicative skills might be related to different aspects of emotion understanding at different developmental points is also discussed.

References

Bebko, J. M., & McKinnon, E. E. (1993). The Language Proficiency Profile-2. Unpublished assessment tool. York University, Toronto, Canada.

Dyck, M. J., Farrugia, C., Shochet, I. M. & Holmes-Brown, M. (2004). Emotion recognition/understanding ability in hearing or vision-impaired children: do sounds, sights, or words make the difference? *Journal of Child Psychology and Psychiatry*, 45(4), 789-800.

Peterson, C. C., Wellman, H. M., & Slaughter, V. (2012). The mind behind the message: Advancing theory of mind scales for typically developing children, and those with deafness, autism, or Asperger syndrome. *Child development*, 83(2), 469-485.

12 Short-term memory and language development: Cause or effect?

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Studies using tests such as digit span and nonword repetition have implicated short-term memory in the development of language (e.g., Baddeley, Gathercole & Papagno, 1998). Such tests ostensibly assess specialised processes for the short-term ma-

nipulation and maintenance of information that are often argued to enable long-term learning about language. We show experimentally and computationally (via CLASSIC, Jones, 2016) that performance on three widely-used measures of short-term memory (digit span, nonword repetition, and sentence recall) is an outcome of long-term associative learning operating on exposure to natural language. We argue that short-term memory, rather than being a specialised system, reflects the opportunistic co-opting of other processes and skills to the specific task setting. The role of short-term memory in the development of higher cognitive functions, especially language, has therefore been misconstrued.

References

Baddeley, A. D., Gathercole, S. E., & Papagno, C. (1998). The phonological loop as a language learning device. *Psychological Review*, 105, 158-173.

Jones, G. (2016). The influence of children's exposure to language from two to six years: The case of nonword repetition. *Cognition*, 153, 79-88.

13 How to assess children's knowledge of mental terms? Adapting a tool to measure comprehension of metacognitive vocabulary in Polish

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Our lexicon includes terms that depict psychological states of self and others. The acquisition of such metacognitive vocabulary (e.g. know, think, guess, or learn and teach) is indicative of children's development of Theory of Mind (ToM), the ability to attribute mental states to oneself and others and to predict people's behaviour on the basis of their mental states. Although children start using metacognitive terms in preschool years, the full meaning of these terms, as indicated by their contrastive use (e.g. know-think, guess-figure out), is not mastered until age 6-7 (Antonietti, et al, 2006; Johnson & Wellman, 1980). Importantly, the comprehension of contrastive uses for metacognitive terms is not measured either by lexical tests, or by classic ToM tests (i.e., false-belief tasks).

The poster will present a Polish adaptation of the tool designed to assess metacognitive vocabulary comprehension in children at school entrance age

– Metacognitive Vocabulary Test (METVOC; Astington & Pelletier, 2003). The task consists of 14 story-episodes illustrated by pictures. At the end of each episode children choose one of two contrastive metacognitive terms that is appropriate for the context. The poster will focus primarily on the steps of the adaptation process: the choice of target words in Polish (e.g. based on words frequency and back-translation), the adjustment of the stimuli (e.g. cultural differences, the complexity of stories and accompanying pictures, the position of target items in the test questions), the differences in the properties of the metacognitive lexicon in English and Polish (e.g. the fact that there is no teach/learn distinction in Polish).

We will also present the results of a pilot study on 30 Polish monolingual children at school entrance age, and will discuss the links between metacognitive vocabulary (as measured by METVOC) and children's vocabulary size (expressive and receptive), their receptive grammar skills and ToM development.

References

Antonietti, A., Liverta-Sempio, O., Marchetti, A., & Astington, J. W. (2006). Mental Language and Understanding of Epistemic and Emotional Mental States. In A. Antonietti, O. Liverta-Sempio, & A. Marchetti (Eds.), *Theory of Mind and Language in Developmental Contexts* (pp. 1–30). Springer US.

Astington, J. W., & Pelletier, J. (2003). Theory of mind and metacognitive vocabulary development in first and second languages. Unpublished manuscript, University of Toronto.

Johnson, C. N., & Wellman, H. M. (1980). Children's Developing Understanding of Mental Verbs: Remember, Know, and Guess. *Child Development*, 51(4), 1095–1102.

14 Preschool Teachers' Use of Elaborative Language across Classroom Contexts and Children's Language Development

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Preschool classrooms serve as critical contexts to support children's language development (Dickinson & Porche, 2011). Teachers foster these skills through cognitively stimulating and elaborative talk, conversation that provides/ requests explanation, analysis, and brainstorming. Yet, research exploring teacher talk is inconsistent regarding the

degree to which teachers use cognitively stimulating, elaborative talk, the classroom contexts that best support this talk, and the extent to which it is related to child outcomes. Thus, the current study explored teacher use of elaborative language during circle-, center-, and meal-times and the influence of this talk on preschoolers' language skills.

Participants included 64 lead teachers (Mage=44 years, SD=11.78; 97% female) from U.S. preschools serving low-income Latino families. Teachers had been working as a lead teacher for, 11 years (SD=9.71), on average. Trained investigators observed classrooms at the beginning and end of the school year using the Language Interaction Snapshot (LISn; Atkins-Burnett et al., 2011), a time-sampling tool designed to capture classroom language. Each observation consisted of ten, thirty-second segments during which the observer noted the presence or absence of language markers. Four observations were collected for each context. Furthermore, six children from each participating classroom (n=384; Mage=45.72 months, SD=6.78; 52% girls) were randomly selected for direct assessments. Children's baseline scores were collected at the beginning of the year, and their language skills were assessed at the end of the year using a combination of standardized and naturalistic measures.

Preliminary results suggest that teachers used cognitively challenging talk most during circle time and least during center time. Moreover, children whose teachers used more challenging talk had higher language skills than children in classrooms with less challenging talk. Results are discussed in relation to the importance of supporting teachers' use of cognitively stimulating talk to foster children's language development.

References

Dickinson, D. K., & Porche, M. V. (2011). Relation between language experiences in preschool classrooms and children's kindergarten and fourth-grade language and reading abilities. *Child development*, 82(3), 870–886.

Atkins-Burnett, S., Sprachman, S., Lopez, M., Caspe, M., & Fallin, K. (2011). The Language Interaction Snapshot (LISn): A new observational measure for assessing language interactions in linguistically diverse early childhood programs (No. 77f15fbd004142b1931b56490df55f87). *Mathematica Policy Research*.

15 Relationship between Metalinguistic Awareness, Nonverbal Problem-Solving, and Language Skills of 3- to 7-year-old Children

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Metalinguistic awareness is the ability to think about and reflect on language (Bialystok, 1988). Relatively little is known about the course of metalinguistic development for children who are typically developing monolingual speakers. Increased knowledge of metalinguistic development is important to better understand the co-development of cognitive and language skills and potentially to improve how language is taught to children with language-learning weaknesses. The purpose of the current study was to better understand metalinguistic development in typically developing children and its relationship with cognitive and language development. Using a cross-sectional design, we evaluated the impact of age on metalinguistic performance. We also examined the relationship between metalinguistic performance, nonverbal cognitive ability, and expressive language skills.

Participants included 62 3-year olds, 67 4-year olds, 85 5-year olds, 98 6-year olds, 100 7-year olds, and 44 8-year-olds. Each child completed the Matrices subtest of the Kaufman Brief Intelligence Test, Second Edition, the Word Structure subtest of the Clinical Evaluation of Language Fundamentals, and a metalinguistic awareness probe. The metalinguistic probe included four tasks: a word renaming task, a word swap task, a morpheme production task, and a grammatical judgment task.

We conducted a series of ANOVAs to compare performance on each of the metalinguistic tasks across age groups. There was a significant effect for age for all tasks (all p s < .001). Follow-up analyses revealed that generally, each age group outperformed younger age groups. Correlational analyses indicated strong positive relationships with performance on the metalinguistic probe and performance on the expressive language task. These results further support the close relationship between metalinguistic awareness and language ability. Results from this study suggest that it may be beneficial to build child's metalinguistic skills to strengthen language development.

References

Bialystok, E. (1988). Levels of bilingualism and levels of linguistic awareness. *Developmental Psychology*, 24(4), 560-567. doi: 10.1037/0012-1649.24.4.560

16 Syntactic Bootstrapping: 28-month olds can assign verb meaning using both transitive and intransitive frames at the same visit

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Prior research has shown that two-year-olds who hear novel verbs in transitive frames choose the accompanying causative actions as their referents, while those who hear the verbs in intransitive frames choose noncausative and synchronous actions as their referents (Arunachalam & Waxman, 2010; Messenger, Yuan & Fisher, 2015). However, earlier studies are limited because they employed a between-subject design in which participants heard novel verbs in transitive or intransitive frames. Our study is the first to investigate the extent to which the same children can flexibly adjust their interpretations of novel verbs when these are presented in transitive vs. intransitive frames at the same visit.

Seventeen 28-months old children were assessed at home using the intermodal preferential looking paradigm (IPL). They viewed a video in which a costumed duck and bunny engaged in four causative actions (e.g., duck pushes bunny into a stretching position) and four noncausative/synchronous actions (e.g., duck and bunny each flex arms in unison). To show reliable comprehension, children should look longer at the causative actions during the transitive test trials ("duck is gorging bunny") and less at the causative actions during the intransitive test trials ("duck and bunny are gorging").

A two (audio: transitive vs. intransitive) x two (trial: control vs. test) ANOVA was conducted with percent looking to causative action as the dependent measure. The results showed an interaction between audio and trial ($F(1,16) = 7.75, p < .05$), indicating significantly different looking to the causative vs. noncausative actions during transitive and intransitive blocks.

These results demonstrate that toddlers are able to use syntactic information to constrain verb meanings for transitive and intransitive sentences at the same visit; i.e., they are flexible in shifting their interpretations for novel verbs depending on the sentence frames, showing efficient and robust syntactic bootstrapping.

References

Arunachalam, S., & Waxman, S. R. (2010). Meaning from syntax: Evidence from 2-year-olds. *Cognition*, 114(3), 442-446.

Messenger, K., Yuan, S., & Fisher, C. (2015). Learning verb syntax via listening: New evidence from 22-month-olds. *Language Learning and Development*, 11, 356–368.

17 Nonword Repetition and Sentence Imitation as Diagnostic Tools for Bilingual Children with Primary Language Impairment

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Accurately assessing bilingual children poses a difficult task for clinicians, more specifically in a linguistic minority context where bilingual children have varying levels of language exposure. Studies indicate that nonword repetition (NWR) and sentence imitation (SI) are useful tools when assessing bilingual children (Thordardottir & Brandeker, 2012). Bilingual children with primary language impairment (PLI) typically score lower on NWR and SI tasks in comparison to their typically developing (TD) counterparts. The goal of this study was to examine the influence of bilingual exposure on both NWR and SI tasks, as well as to determine their accuracy when identifying PLI in bilingual children.

Chiat (2015) created a useful framework for NWR tasks and considered different types of language-specific knowledge that could potentially affect NWR. Following Chiat (2015)'s framework, the NWR task used in the present study was adapted to the French-Canadian language. For the SI task, the SI subtests from both the English CELF 5 and the French CELF CDN-FR were used (Wiig, Semel, & Secord, 2009; Wiig, Semel, & Secord, 2013). Sixty-four bilingual children between the ages of five and six participated, including a group of 50 TD children and a group of 14 children with PLI.

Results showed that the NWR task was not correlated with exposure to the target language; however, SI did not render the same results. Thus, language exposure impacted children's performance during the SI tasks. Additionally, results also revealed that all three tasks accurately discriminated TD bilingual children from their peers with PLI. For French-English (French being the dominant language) bilingual children, the CELF CDN-FR SI task was most discriminating, and for English-French (English being the dominant language) bilingual children, the CELF 5 SI was more discriminating

in comparison to the NWR task. Thus, SI completed in the participant's dominant language may be the most discriminating tool when assessing PLI in bilingual participants living in a linguistic minority context.

References

Chiat, S., (2015). Nonword Repetition. In Armon-Lotem, S., de Jong, J., & Meir, N. (Eds.) (2015) *Methods for assessing multilingual children: Disentangling bilingualism from language impairment*. Bristol: Multilingual Matters.

Thordardottir, E., & Brandeker, M. (2012). The effect of bilingual exposure versus language impairment on nonword repetition and sentence imitation scores. *Journal of Communication Disorders*, 1-16.

Wiig, E., Semel, E., & Secord, W. (2013) *Recalling Sentences*. In *Clinical Evaluation of Language Fundamentals*. Pearson PsychCorp.

Wiig, E., Semel, E., & Secord, W. (2009) *Répétition de phrases*. In *Clinical Evaluation of Language Fundamentals Canadian French* (adapted French version by L. Bouliane & M. Labelle). Pearson PsychCorp.

18 Predictive use of gender-marked articles in Spanish-English bilingual children

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Gender marked articles are an important grammatical structure due to the fact that they precede every noun in Spanish and are therefore used with a high frequency. Articles provide predictive information about the upcoming noun and can help narrow down the potential referent. Current models of sentence comprehension emphasize the role of prediction (c.f. Townsend & Bever, 2001). Previous eye tracking studies suggest that monolingual adult speakers and early learners of languages with gender marked articles, use gender marking to more quickly identify referents in spoken sentence comprehension (Lew-Williams & Fernald, 2007). However, adult second language learners that do not have gender marked articles in their first language, do not tend to show this predictive ability (Lew-Williams & Fernald, 2010).

The purpose of this study is to gain insight into the predictive use of Spanish definite articles in typical Spanish-English bilingual children. In this study, there is a target referent, which is presented with either 3 objects of the same or different grammatical gender. Eye tracking data was collected from

45 Spanish-English bilingual children ages 6-8 and were analyzed by calculating the time it takes a child to look at the target referent after hearing the gender marked definite article. We expected the bilingual children to show predictive use of the gender marked articles as they all began learning Spanish first or simultaneously with English. The children in our study however, did not appear to use articles predictively. This may be due to their amount of current Spanish language use as they are all school age children and have a continued increase of English language input. If all children who begin learning Spanish from infancy use gender predictively, then perhaps as children become increasingly bilingual or English dominant, they have an impaired ability to use common grammatical cues predictively.

References

Lew-Williams, C., & Fernald, A. (2007). Young children learning Spanish make rapid use of grammatical gender in spoken word recognition. *Psychological Science*, 18(3), 193-198.

Lew-Williams, C., & Fernald, A. (2010). Real-time processing of gender-marked articles by native and non-native Spanish speakers. *Journal of Memory and Language*, 63(4), 447-464.

Townsend, D. J., & Bever, T. G. (2001). *Sentence comprehension: The integration of habits and rules* (Vol. 1950). Cambridge, MA: MIT Press.

19 Beyond elaboration: A look at elicitation styles during reminiscing and book reading in Latino dyads from Costa Rica

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Elaboration, the extent to which caregivers encourage children to produce structured and detailed accounts of personal stories, has been considered an essential element in narrative development (Fivush, Haden, & Reese, 2006). This has led to the distinction between caregivers who use a highly-elaborative and a low-elaborative style. More recently, studies on individual differences have focused on other features of narrative, such as the extent to which caregivers promote children's participation in the conversation (Melzi, Schick, & Kennedy, 2011). Among Latinos, evidence indicates caregivers use an elicitor style during reminiscing, encouraging the child to take the role of the main narrator; during book sharing, many Latino caregivers use a recitation style, where they provide most of the in-

formation and the child acts as the audience. But evidence for these styles is still scarce. This poster explores caregivers use of elaborative and participatory strategies in a sample of 108 low income, Costa Rican caregivers while reminiscing and book reading with their preschoolers. Results of cluster analyses suggested the existence of two different elicitation styles for reminiscing in the sample: a low-elicitor (66.7% of the sample) and a high elicitor (33.3%), with the latter encouraging higher levels of children's participation in the conversation. During book reading, two conversational styles were also identified: a recitation style (65.7% of the sample) and a story builder style (34.3%), with the latter encouraging higher levels of children's participation in the conversation. Findings are discussed in light of extant research and implications for developing culturally sensitive interventions using reminiscing and book reading to promote language and literacy among Latino children.

References

Melzi, G., Schick, A. R. and Kennedy, J. L. (2011), Narrative elaboration and participation: Two dimensions of maternal elicitation style. *Child Development*, 82, 1282-1296. doi:10.1111/j.1467-8624.2011.01600.x

Fivush, R., Haden, C. A., & Reese, E. (2006). Elaborating on elaborations: Role of maternal reminiscing style in cognitive and socioemotional development. *Child Development*, 77(6), 1568-1588. doi:10.1111/j.1467-8624.2006.00960.x

20 SES variations in the mental state vocabulary used and heard by young children in family interactions

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This presentation aims to analyse SES variations in the mental-state language used and heard by young children in family interactions at home. Previous research has shown that the caregiver's amount, diversity and discursive use of mental-state language can give way to children's individual differ-

ences in ToM abilities (De Rosnay & Hughes, 2006; Howard, Mayeux & Naigles, 2008). Most of the previous studies have been carried out with middle-income populations. The present study is designed to address differences in the vocabulary that refers to emotions, desires and cognitive states and events that (de la idea de la violencia de g and cognitive states, and events each ientea sociedad. ural, y de la idea de la violencia de g a) is used by 4 year-old Argentine children from middle income and urban-marginalized populations and b) is contained in the input they receive in everyday situations in their homes. The data analyzed consists of 252 hours of spontaneous situations (including play, hygiene, and mealtime situations) recorded in the homes of 21 children (4:5) from urban - marginalized populations and 228 hours of spontaneous situations (play, hygiene, meal) recorded in the homes of 19 children (4:5) from middle-income populations. Each child's home was recorded for 12 hours. Data was transcribed according to CHAT and analysed using the CLAN Program (MacWhinney, 2000). The analysis considered the quantity and diversity of nouns, adjectives and verbs that refer to emotions, cognitions and desires that the children were exposed to and produced themselves. Results showed significant differences according to social groups in the amount of mental terms that they used ($z = -3,86$ $p > 0,00$) and that were contained in their input ($z = -3,58$ $p > 0,00$) as well as an association between the mental-state language they were exposed to and that which they produced ($r = 0,584$ $p > 0,01$). No differences in mental-state language were observed relative to gender (children's types: $z = -1,56$ $p > 0,12$; types in the input: $z = -0,11$ $p > 0,91$).

References

- De Rosnay, M., & Hughes, C. (2006). Conversation and theory of mind: Do children talk their way to socio-cognitive understanding? *British Journal of Developmental Psychology*, 24(1), 7-37.
- Howard, A. A., Mayeux, L., & Naigles, L. R. (2008). Conversational correlates of children's acquisition of mental verbs and a theory of mind. *First Language*, 28(4), 375-402.
- MacWhinney, B. (2000). *The CHILDES project: tools for analyzing talk* (third edition). Mahwah, N.J.: Lawrence Erlbaum Associates.

21 Child-initiated and decontextualized topics promote connected parent-child conversation

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Children learn language through a combination of input and interaction [1]. For preschool-aged children, input containing decontextualized references (e.g., the past/future, explanations), and "connected" conversation (i.e., when one speaker's contribution is semantically related to the other's) promotes children's oral language, and in turn, prepares them for the academic language they will come to use during formal schooling [2-3]. However, it is unknown whether decontextualized references are more likely to occur within connected conversations, the combination of which may be an especially beneficial context for academic language readiness. We predicted that decontextualized conversations are more connected than contextualized conversations (i.e., grounded in the here-and-now), because speakers use language to establish common ground to ensure their message is clear. We further predicted that decontextualized talk inside – as opposed to outside of – connected conversation will contain more complex language that simulates academic language.

Interactions between parents and four-year-old children ($n = 35$) were videotaped during a snack-time, a context that promotes decontextualized conversation. Interactions were reliably transcribed and the start and end of individual conversations were marked ($n = 376$ conversations). Connectedness was defined as the number of parent and child conversational turns that were semantically related to the previous turn. We then coded whether each turn contained a decontextualized or contextualized reference, and the number of conjunction words (e.g., if, or, but) found inside and outside of connected turns as a proxy measure for academic language.

Conversations containing decontextualized language were more connected than those containing contextualized language, but only when both speakers produced decontextualized talk. Second, parents' decontextualized talk within connected conversation better simulated academic language, as it contained more conjunctions than decontextualized talk outside of connected conversation. Our results suggest that input and interaction should be considered together when considering what conversational contexts best prepare children for the academic language of formal schooling.

References

- Hoff, E. (2006). How social contexts support and shape language development. *Developmental Review*, 26(1), 55-88.
- Ensor, R., & Hughes, C. (2008). Content or connectedness? Mother-child talk and early social understanding. *Child Development*, 79, 201-216.
- Snow, C. E. (1991). The theoretical basis for the relationships between language and literacy in development. *Journal of Research in Childhood Education*, 6, 5-10.

22 The Effect of SES on Pronoun and Reflexive Interpretation

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Socioeconomic status (SES) has substantial impact on children's language acquisition, and differences have been found mainly in language productivity (Hoff, 2006). To investigate the effect of SES on language comprehension, the present study investigated pronoun (e.g., him) and reflexive (e.g., himself) interpretation. Reflexives often refer to local antecedents (e.g., Maryj says that the girlk likes herselfk), whereas pronouns co-refer with non-local antecedents (e.g., Maryj says that the girlk likes herj).

It has been argued that pronoun and reflexive interpretation requires not only grammatical knowledge, but also Theory of Mind (ToM) (i.e., taking others' perspective) (Hendriks, 2014). It has also been reported that children's performance on ToM tasks are often positively correlated with the number of siblings in a family (Perner et al., 1994). These previous findings invite us to ask (1) whether children from different SES background display different pronoun and reflexive interpretation, (2) how does pronoun and reflexive interpretation relate to language capacity, cognitive capacity, and the presence of siblings?

We tested 81 Mandarin-speaking children (mean age 4;7, range 3;5 – 6;2). According to district per capita annual disposable income and kindergarten monthly tuition, they were divided into two SES groups (high, low). All children completed a picture selection task with one picture presenting a self-oriented action and the other showing an other-oriented action. Simple sentences with object pronouns (e.g., The girl is touching her) or object reflexives (e.g., The girl is touching herself) were provided. Their teachers reported their language and cognitive abilities on language and cognition questionnaires.

Reflexive accuracy varied among SES groups (high > low), but pronoun accuracy did not. Only low SES children demonstrated the "pronoun mastered reflexive not mastered" pattern. Children displaying this unique pattern were scored lower than other children in language, cognition and ToM. No difference in pronoun accuracy was found between the two groups relating to number of siblings.

References

- Hoff, E. (2006). How social contexts support and shape language development. *Developmental Review*, 26(1), 55-88.
- Hendriks, P. (2014). Asymmetries between language production and comprehension. Dordrecht: Springer.
- Perner, J., Ruffman, T., & Leekam, S. R. (1994). Theory of mind is contagious: You catch it from your sibs. *Child development*, 65(4), 1228-1238.

23 Early Language Development in Victims of the Armed Colombian Conflict

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Introduction:

The appreciations of parents about the linguistic performance of their children varies depending on their educational and socioeconomic levels (Hoff, 2003). Jackson and contributors (2003) state that parents' report is influenced by their instructional level and economic vulnerability characterized for low income in the family group. They emphasize that children living in a vulnerable context should be analyzed particularly and that their CDI results need to be observed carefully. (Jackson-Maldonado et al., 2003). Colombia has been facing an armed conflict for 52 years. As a result, families had been displaced from their place of origin to the big cities with limitations in their access to health and education services.

Objective:

This study analyses the data from the standardization process of the MacArthur-Bates Communicative Development Inventories to the Colombian population, taking into account the specific social and economic characteristics of the context and their influence in the language acquisition process in 80 children victims of the armed Colombia conflict who live like refugees in Bogotá City and his controls.

Procedures:

80 displaced mothers and 80 controls with a similar family structure and socioeconomic conditions completed the CDI- Colombian adaptation with support from professionals. Results were statistically analysed to obtain descriptive data about children communicative skills comparing the two groups.

Results:

In children from 12 to 16 months (CDII) statistical differences were found in many aspects that were considered: sentence comprehension, words produced, early gestures and late gestures. In children from 16 to 30 months, differences were found in irregular verb forms, sentence complexity and words' endings.

There are not significant differences in the amount of words produced. Results confirm the relevance of socioeconomical variables and their impact in language. Aspects such as mothers' posttraumatic stress and prenatal and post-natal factors were taken into account.

References

Jackson-Maldonado, D., Thal, D., Marchman, V., Newton, T., Fenson, L., & Conboy, B. (2003). *MacArthur Inventarios del Desarrollo de Habilidades Comunicativas. User's Guide and Technical Manual.* . Baltimore: Brookes.

Hoff, E. (2003). The Specificity of Environmental Influence: Socioeconomic Status Affects Early Vocabulary Development Via Maternal Speech. *Child Development*, 74(5), 1368-1378.

24 Children reduce their communicative intentions appropriately

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Previous research has shown that children are able to differentiate between varying intentions of their interlocutors and choose their own behaviour accordingly (e.g. Tomasello et al., 2005). Specifically, in a recent study (Grosse, Scott-Philips, & Tomasello, 2013), pre-schoolers were less likely to ostensively communicate the location of a hidden object when their interlocutor asked them not to help. In this task an experimenter modelled communicative helping behaviour and subsequently prompted the children to communicate. Here, we investigate whether pre-schoolers are able to adjust their communicative behaviour between two speakers without such an adult model.

We adapted the paradigm of Grosse and colleagues (2013) to a within-subjects design. Three-year-olds played a hide-and-seek game together with two different hand-puppets. In this game, four puzzle pieces were hidden under ten possible object locations. The first puppet reacted grateful to the

children's help in finding the pieces (original control condition). The second puppet reacted in a discontented manner to the children's attempts to help (original experimental condition). We analysed the degree of ostensiveness and informativeness of the children's communicative helping behaviour using a 4-point-scale: full (situations in which the child made no attempt to hide their communicative behaviour towards the hand-puppet with full informativeness), reduced (attempts to mitigate the fact that communication was taking place with partial informativeness), hidden (situations in which the fact that the child revealed the object's location was wholly suppressed with full or partial informativeness), no-help (no attempts to reveal the object's location). We found, that children successfully reduced their communicative helping behaviour in the interaction with the second hand-puppet compared to the first hand-puppet, $Z = -2.551$, $p = .011$.

Our findings replicate previous results (Grosse et al., 2013) and moreover show, that children – even without prior modelling – adapt their behaviour to two different interaction partners with varying intentions.

References

Grosse, G., Scott-Phillips, T. C., & Tomasello, M. (2013). Three-year-olds hide their communicative intentions in appropriate contexts. *Developmental Psychology*, 49(11), 2095–2101.

Tomasello, M., Carpenter, M., Call, J., Behne, T., & Moll, H. (2005). Understanding and sharing intentions: The origins of cultural cognition. *Behavioural and Brain Sciences*, 28, 675–735.

25 Young children's understanding of prosodic cues about speaker confidence: Comparison between Japanese-speaking and French-speaking children

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Young children prefer to learn novel words from a knowledgeable or confident informant over an ignorant or uncertain counterpart (Matsui, Yamamoto, Miura, McCagg, 2016; Sabbagh & Baldwin 2001). During preschool years, children come to use a

variety of social cues to determine whether the informant is knowledgeable or not, but little is known as to whether they can use prosodic cues for the informant's degree of confidence. Sensitivity to emotional or attitudinal prosody among adults is known to vary across cultures (Ishii, Reyes, Kitayama 2003). If so, children's sensitivity to prosodic cues about speaker confidence may also develop in a culturally specific way. The aim of the current study is to test the possibility by comparing children in Eastern and Western cultures.

Thirty Japanese-speaking children (M = 40 months) and 30 French-speaking children (M = 43 months) participated in the study. Each of the 6 experimental trial consisted of 3 phases. In the introduction phase, a bird appeared and asked the child "What is X (the name of the novel object, e.g. toma)?" In the naming phase, two puppets appeared one by one and made contradictory statements, each saying "this is a toma," but pointing to a different object. One puppet's statement ended with falling intonation, indicating that the speaker is confident, and the other puppet's statement ended with rising intonation, suggesting that the speaker is uncertain. In the test phase, children were asked to indicate which of the two objects would be the toma.

Japanese-speaking children selected the object that was named with the falling intonation at well above chance level (M=87.2%, SD=1.25; $t(29)=9.78$, $p=.000$) while French-speaking children's performance was close to chance (M=52.8%, SD=1.08; $t(29)=.8415$, $p=.407$, n.s.). There was a significant group difference ($t(30)=6.835$, $p=.000$). The results confirm our prediction that development of sensitivity to prosodic cues about speaker confidence indeed varies cross-culturally.

References

Ishii, K., Reyes, J. A., & Kitayama, S. (2003). Spontaneous attention to word content versus emotional tone: Difference among three cultures. *Psychological Science*, 14(1), 39-46.

Matsui, T., Yamamoto, T., Miura, Y., & McCagg, P. (2016). Young children's early sensitivity to linguistic indications of speaker certainty in their selective word learning. *Lingua*, 175 (6), 83-96.

Sabbagh, M. A., & Baldwin, D. A. (2001). Learning words from knowledgeable versus ignorant speakers: Links between preschoolers' theory of mind and semantic development. *Child Development*, 72, 1054-1070.

26 Cooperative communication and language development in toddlers with autism spectrum disorder

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The present study examines the effects of different aspects of cooperative communication i.e. joint attention and functional play, on language development in toddlers with Autism Spectrum Disorder (ASD). The role of joint attention in language development in typically developing children (TD) and in children with ASD is widely documented. On the other hand, very few studies examine the role of functional play in language development in ASD. Investigation of the motive for cooperation in relation to language may help to further highlight communicative abilities in ASD.

Ten children diagnosed with ASD (8 boys and 2 girls, mean age 4;1) and 10 typically developing (TD) toddlers (8 boys and 2 girls, mean age 1;5) were matched for visuospatial, fine motor, and linguistic abilities on the raw scores of the Mullen Scales of Early Learning (MSEL). Vocabulary development was also assessed with the Language Development Survey (LDS). Children were video-recorded weekly for a month, while playing with their mother with toys provided by the researcher. Each recording lasted approximately 30 minutes. Microanalysis of the behavior on a 20 minute footage was carried out and the following categories were coded: initiation of joint attention, response to joint attention, simple functional play and elaborated functional play. Results demonstrated that children with ASD initiated less joint attention episodes and responded to joint attention bids significantly less, while they spent significantly less time in simple and elaborated functional play, compared to TD children. Moreover, elaborated functional play showed a significant main effect and an interaction-effect with disorder on expressive language and vocabulary, and a marginally significant main effect and interaction-effect with disorder on receptive language.

In toddlers with ASD deficits in elaborated functional play, which is the age appropriate cooperative behavior, seems to affect language development and especially vocabulary production.

References

Christensen, L., Hutman, T., Rozga, A., Young, G., Ozonoff, S., Rogers, S.J., Baker, B. & Sigma, M. (2010). Play and Developmental Outcomes in Infant Siblings of Children with Autism. *Journal of Autism and Developmental Disorders* 40, 946-957.

Trevarthen, C. & Daniel, S. (2005). Disorganized rhythm and synchrony: Early signs of autism and Rett syndrome. *Brain & Development* 27(SUPPL. 1), S25-S34.

Williams, E., Reddy, V. & Costall, A. (2001). Taking a Closer Look at Functional Play in Children with Autism. *Journal of Autism and Developmental Disorders* 31(1),

27 The France-Canada Speech Sound Disorders Project

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The France-Canada SSD Project aims at developing an evaluation approach for speech sound disorders (SSD) that identifies subtypes of SSD based on a psycholinguistic model of speech processing (Stackhouse & Wells, 1997). Our goal is to acquire normative data on phonological development in French-speaking children and to obtain a standardized tool that assesses various levels in the model, on both perception and production sides. We propose to specifically test production levels with four tasks: word-naming, nonword repetition, oral diadochokinesis and syllable repetition.

During a pilot study, we collected production data on 20 monolingual French children aged 6 to 11 years. We analyzed this data to evaluate the feasibility of our tasks and to document the acquisition of phonetic details and phonological categories of stop consonants.

These preliminary results show that our assessment tasks are sensitive and do not show ceiling effects even for children aged 11 years. For the nonword repetition task, we observe a continuous increase in the scores. A cross-language comparison on the diadochokinesis task shows that our data are in the range of data from other languages, but that there are significant differences, which suggest that we need specific French data even on this simple repetition task.

To examine the acquisition of stop consonants, we analyzed the accuracy scores for the naming task. The results show an effect of age on the accuracy score, which indicates that, even between 6 and 11 years of age, children are maturing their phonological representations. The acoustical analysis on the Voice Onset Time indicates that children are mastering voicing but more data is needed for a finer description of the acquisition process.

Future prospects concern the creation of a full and functional test which will allow us to describe milestones for the phonological development of Canadian and French francophone children.

References

Stackhouse, J. & Wells, B. (1997). Children's speech and literacy difficulties. A psycholinguistic framework. London : Whurr.

Rvachew, S., Marquis, A., Brosseau-Lapré, F., Paul, M., Royle, P., Gonnerman, L. (2013). Speech articulation performance of francophone children in the early school years: Norming of the Test de Dépi-stage Francophone de Phonologie, *Clinical Linguistics and Phonetics*, 27(12), pp. 950-968.

SHELSTRAETE, M.-A., MAILLART, C., JAMART, A.-C. (2004). Les troubles phonologiques : cadre théorique, diagnostic et traitement. In SCHELSTRAETE M.-A., NOEL, M.-P. (Eds), *Les troubles du langage et du calcul chez l'enfant* (pp. 81-112). Editions EME, Intercommunication.

28 An insight into spontaneous communication of children with Autism Spectrum Disorder acquiring Croatian: morphosyntactic errors

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Language acquisition varies across the autism spectrum (ASD). While the core features of language have historically been described as relatively intact, the ability to appropriately use language shows constant impairments (Tager-Flusberg 2006). However, performance consistent with morphosyntactic deficits has been reported in later studies for the part of ASD population (onward: ASD+MSD) (Walenski et al. 2014). The descriptions of such deficits are based primarily (if not exclusively) on English data and list problems with morphology, namely omissions (both bound morphemes and function words) and overregularizations. Our goal was (1) to observe how ASD+MSD children acquire morphologically richer language (Croatian) by analysing their morphosyntactic errors and (2) to examine the homogeneity of language phenotype in this population.

Method. Individual therapy sessions of two Croatian speaking five-year-old ASD+MSD participants (≥ 1.5 SD below the mean on language tests) were recorded during a five-month period (40 sessions). Speech samples were transcribed in CLAN

(MacWhinney, 2000). The errors were classified by type, part of speech, and grammatical category. Basic measures (mean length of utterance, mean length of turn, vocabulary diversity D) were calculated per sample.

Results. The results show that the participants produce 10% or 12% of erroneous tokens. Morphosyntactic errors account for the 75%. Inflection errors are most common (84%; derivational errors 10%; overregularizations 6%). Most inflectional errors are associated with nouns (48%), verbs (30%) and adjectives (10%), but other types of errors are also detected. Regardless of their language development level (differences: MLU, MLT, test results) errors of the two participants are comparable.

Conclusion. Apart from a great diversity of omission errors and overregularizations Croatian data show a large number of substitutions. Substitution errors have not been previously associated with this population which corroborates the role of language typology in the description of any broken language conditions, including underresearched population of ASD+MSD children.

References

Tager-Flusberg, H. (2006). Defining language phenotypes in autism, *Clinical Neuroscience Research*, 6, 3-4, 219-224.

Walenski, M., Mostofsky, S. H., Ullman, M. T. (2014). Inflectional morphology in high-functioning autism: Evidence for speeded grammatical processing, *Research in Autism Spectrum Disorders*, 8, 11, 1607-1621.

MacWhinney, B. (2000). *The CHILDES Project: Tools for analyzing talk*. Third Edition. Mahwah, NJ: Lawrence Erlbaum Associates.

29 Verb Structures in Two French Cochlear-Implanted Children

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A recent review of studies on language skills in deaf children with early cochlear implantation (Hallé & Duchesne, 2015) shows that these children reach standard levels in terms of overall language skills but that difficulties persist in morphosyntax. Yet according to these authors, the tests used to evaluate these skills provide a partial image of their difficulties, and complementary analyses should bear on spontaneous language. Our presentation

provides a study on verb structures in spontaneous language: it is based on video recordings of 2 profoundly deaf French children, implanted early (at the age of 13 and 18 months, respectively), both filmed 36 months after implantation. An earlier recording is also available for both children, which can be used as reference point. In the films, the children are playing at picture matching games and construction games with an adult. A normally hearing child has been recorded in the same conditions for comparison.

Our analysis of verb structures in the data shows that both children produce standard transitive structures (SVO) and non-transitive structures (SV), which co-exist with non-standard forms in which the expected object can be either missing or occupying the subject location. When the children use anaphoric pronouns as objects, their difficulties are greater if the anaphoric process is extended to several propositions. We will discuss our findings in relation to the possible deficit of phonological short term working memory in deaf children (Bourdin 2015). This deficit could hinder further language development.

References

Hallé, F. & Duchesne, L. (2015). Habiletés morphosyntaxiques des enfants sourds porteurs d'implants cochléaires : une revue systématique. *Revue canadienne d'orthophonie et d'audiologie*, 39 (3), 260-297.

Bourdin, B. (2015). Un modèle capacitaire du traitement langagier chez l'enfant sourd : le cas de la morphosyntaxe. *Approche Neuropsychologique des Apprentissages chez l'Enfant (ANAE)*, 138, 469-476.

30 Subject-verb agreement in German-speaking children and adolescents with Down syndrome

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Introduction

Children with Down syndrome (DS), a genetic developmental disorder that leads to mild to moderate mental retardation, display noticeable problems in the acquisition of morphosyntax (Roberts et al. 2008). So far, research has been mostly confined to English-speaking individuals. However, English morphology is relatively simple compared to other languages like German for example. The acquisition of subject-verb agreement in main clauses is a crucial developmental milestone in German

which is typically achieved by the age of three years (Clahsen 1988). The aim of this study was to examine whether German children and adolescents with DS show problems in the acquisition of this milestone compared to typically developing children.

Method

Using a video description task, 30 short sentences in 2nd and 3rd person singular and 3rd person plural contexts were elicited. 34 children and adolescents with DS (mean chronological age (CA): 12;2 years, mean nonverbal mental age (MA): 4;5 years) as well as a control group of 18 typically developing children (mean CA: 3;11 years, mean MA: 4;4 years) took part in the experiment.

Results

All children in the control group had acquired subject-verb agreement. The children and adolescents with DS performed significantly worse than the control group ($t(33.291)=-6.374$; $p < .001$). However, while a subgroup of 12 subjects with DS have correctness scores of over 90 % for subject-verb agreement, the other children produce mainly (root) infinitives.

Conclusion

For at least part of the subjects with DS, problems in subject-verb agreement do exist despite the fact that these phenomena are typically acquired by the age of three. Therefore, the deficit cannot simply be attributed to the general cognitive delay. Errors consisted mainly of root infinitives which corresponds to an early stage in typical acquisition.

References

Clahsen, H. (1988). *Normale und gestörte Kindersprache: Linguistische Untersuchungen zum Erwerb von Syntax und Morphologie*. Amsterdam: J. Benjamins.

Roberts, J. E., Chapman, R. S. & Warren, S. F. (Eds.) (2008). *Speech and Language Development and Intervention in Down Syndrome and Fragile X Syndrome*. Baltimore: Brookes Publishing.

31 Phonological profiles in neurodevelopmental disorders: a comparison of Williams, Down and Fragile X syndromes

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A growing body of evidence supports alternative pathways of language acquisition in neurodevelopmental disorders. However, genetic syndromes show contrasting and fractionated profiles at different levels of the linguistic phenotypes. In contrast to an impaired phonology in Down syndrome, late phonological outcomes in Williams and Fragile X syndrome show a relative strength (Majerus, 2004; Roberts et al., 2005). However, they all differ from typical development in ways that have been related to auditory temporal processing, phonological memory, or prosodic cues mediating in phonological representations.

The aim of the current study was to compare the frequency, type and distribution of phonological errors in conversational corpora from Williams, Down, and Fragile X syndrome populations. The phonological profiles obtained were compared with those from a normative sample of the later stages of typical phonological development in Spanish, in order to assess atypical phonology within the context of neurodevelopmental disorders. The subjects of the study were divided in three groups of 12 individuals: WS group, DS group, FXS group (children, adolescents, and adults). The normative sample of typical late phonological development included 240 children from 3 to 6 years. The speech corpora were transcribed and coded with the CHILDES tools (MacWhinney, 2000). Phonological errors were coded considering two levels: syllable structure and segmental level, and considering two types of errors: omissions and substitutions.

Results show a much higher incidence of errors in the DS group than in WS and FXS. Depending on age range, WS and FXS differences with TD children varied. As in TD, the three groups showed a higher frequency of syllable structure errors, and a lower frequency of omissions and substitutions at the segmental level of analysis. Relative distribution of errors clearly shows an atypical profile in the three disorders, although an ongoing qualitative assessment of error types will provide better specified syndromic profiles.

References

MacWhinney, B. (2000). *The CHILDES Project: Tools for Analyzing Talk*. Mahwah, NJ: Lawrence Erlbaum Associates.

Majerus, S. (2004). Phonological processing in Williams syndrome. In S. Bartke & J. Siegmüller (Eds.), *Williams syndrome across languages* (pp. 125-142). Amsterdam: John Benjamins.

Roberts, J., Long, S.H., Malkin, C., Barnes, E., Skinner, M., Hennon, E.A., Anderson, K. (2005). A comparison of phonological skills of boys with fragile X syndrome and Down syndrome. *Journal of Speech, Language, and Hearing Research*, 98(5), 980-995.

32 Artificial grammar learning in children with Williams syndrome and in typically developing children: the role of rules, familiarity and prosodic cues

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Artificial grammar learning (AGL) is an empirical paradigm which is used to investigate basic pattern and structural processing in typical and atypical populations (Conway, Bauernschmidt, Huang, & Pisoni, 2010; Pothos, 2007). It can inform how higher cognitive functions, such as language use, take place. This study used AGL to assess how children with Williams syndrome aged between 6 and 18 (WS) ($n=16$) extract patterns in structured sequences of synthetic speech, how they compare to typically developing (TD) children ($n=60$), and how prosodic cues affect learning. The TD group was split into younger (matched to the WS group on non-verbal abilities) and older TD (who were closer to the WS group on chronological age). The results showed that the TD children relied mainly on rule-based generalization when making judgements about the acceptability of sequences, whereas children with WS relied on familiarity with specific stimulus combinations. Younger TD participants (mean age 5 years 1 month), whose non-verbal abilities were within the range of the WS group, showed less evidence of relying on grammaticality compared to older TD participants (mean age 8 years 7 months). In absence of prosodic cues, only the children with WS did not demonstrate evidence of learning. Results suggest that, in WS children, the transition to rule-based processing in language does not keep pace with TD children and may be an indication of differences in neuro-cognitive mechanisms.

References

Conway, C. M., Bauernschmidt, A., Huang, S. S., & Pisoni, D. B. (2010). Implicit statistical learning in language processing: Word predictability is the key. *Cognition*, 114, 356-371.

Pothos, E. M. (2007). Theories of artificial grammar learning. *Psychological Bulletin*, 133, 227-244.

33 Semantic reorganization in the lexicon: Acquiring spatial prepositions in English

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Children show early sensitivity to notions of containment, tight-fit, and support. But how these meanings get organized as an interconnected lexical network? Prior research demonstrates that children's verb categories show little convergence with adult categories (Saji et al. 2011) whereas children's noun categories converge with adult categories to a relatively greater degree (Ameel et al. 2008). This asymmetry is in line with the natural partitions theory (Gentner & Boroditsky 2009), which predicts earlier acquisition of referential versus relational concepts. This theory also predicts protracted development of spatial prepositions that, like verbs, encode relational concepts.

Four-year-olds ($N=11$), seven-year-olds ($N=8$), and adults ($N=9$) described 71 scenes depicting spatial relationships. To assess convergence in preposition use, scene-by-preposition matrices were constructed for each age group. Following Ameel et al. (2008), correlations were calculated for row vector pairs, reflecting pairwise similarity of spatial relations based on the prepositions used to label them. Second-order correlations were calculated between the first-order correlation matrices, representing naming similarities between age groups.

Children converge towards adult-like categories early: $r=0.8$ between 4-year-olds and adults and $r=0.89$ between 7-year-olds and adults. These correlations are even higher than those reported in Ameel et al.'s (2008) study of Dutch nouns used to name containers ($r=.56$ (bottles) and $r=.72$ (dishes) between 5-year-olds and adults; $r=.68$ (bottles) and $r=.8$ (dishes) between 8-year-olds and adults).

Despite mature preposition use, convergence with adults increases from 4 to 7 years suggesting ongoing development. Children use fewer prepositions

(7-year-olds: 21 types; 4-year-olds: 19 types) than do adults (32 types), and exhibit overextensions. E.g., on/on top is extended to 61 scenes by 4-year-olds, 55 scenes by 7-year-olds, and 51 scenes by adults.

Our study suggests that, although spatial preposition categories are still developing in later childhood, they are not necessarily harder to acquire than are object categories labeled by nouns.

References

Ameel, E., Malt, B. C., & Storms, G. (2008). Object naming and later lexical development: From baby bottle to beer bottle. *Journal of Memory and Language*, 58, 262–285.

Gentner, D., & Boroditsky, L. (2009). Early acquisition of nouns and verbs: Evidence from Navajo. In V. Gathercole (Ed.), *Routes to Language: Studies in honor of Melissa Bowerman*, (pp.5–36). New York, NY: Taylor & Francis.

Saji, N., Imai, M., Saalbach, H., Zhang, Y., Shu, H., & Okada, H. (2011). Word learning does not end at fast-mapping: Evolution of verb meanings through reorganization of an entire semantic domain. *Cognition*, 118, 48–64.

semantic category (in this study, “animals”) as they can in one minute. Optimal performance requires a systematic search of the lexicon, retrieval of words within a subcategory (e.g. pets), and, as retrieval slows down, switching to a new subcategory (e.g. zoo animals). Hence semantic fluency measures lexical organisation (as indexed by subcategories) and retrieval (as indexed by the number of items retrieved and switching)2.

Participants were 106 deaf children (69 used spoken English, 29 British Sign Language, and 8 Sign-Supported English; 66 had hearing aids, 40 had cochlear implants) and 121 hearing English-speakers, aged 5-11 years. This represents the largest and most varied group of deaf children yet to undertake the semantic fluency task. Deaf children in all language groups produced significantly fewer items than hearing children, but showed similar patterns of responses with respect to items most commonly retrieved, the clustering of items into subcategories, and switching between subcategories. Deaf children scored lower than the hearing group on the Expressive One Word Picture Vocabulary Test3, and there were moderate correlations between EOWPVT raw scores and the number of items produced in the semantic fluency task (deaf: $r=.565$, $p<.001$; hearing: $r=.493$, $p<.001$).

We conclude that the lexical organisation and retrieval strategies of deaf children, regardless of language modality, do not necessarily differ from hearing children, but their smaller vocabularies result in reduced productivity on the semantic fluency task.

References

Boons, T., De Raeve, L., Langereis, M., Peeraer, L., Wouters, J., & Van Wieringen, A. (2013). Expressive vocabulary, morphology, syntax and narrative skills in profoundly deaf children after early cochlear implantation. *Research in Developmental Disabilities*, 34, 2008–2022.

Troyer, A. K., Moscovitch, M., & Winocur, G. (1997). Clustering and switching as two components of verbal fluency: Evidence from younger and older healthy adults. *Neuropsychology*, 11, 138–146.

Brownell, R. (2000). *Expressive One Word Picture Vocabulary Test*, 3rd edition. Novato: Academic Therapy Publications.

ZONE 2

34 Semantic fluency as a window onto lexical organisation and retrieval in deaf children who use spoken and signed language

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Deafness impacts children’s ability to acquire spoken language. Signed languages provide a more accessible language input, but the majority of deaf children are born to hearing parents and lack early access to sign language. Deaf children are therefore at high risk of language delays1.

We compared deaf and hearing children’s vocabulary by examining their performance on a semantic fluency task. Semantic fluency requires participants to name as many exemplars of a particular

35 Lexical composition and language assessment: using diverse word categories for 3 year-old Spanish-speaking children

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It is difficult to determine the most pertinent lexical items for language assessment. Many parent report instruments have a strong noun bias. At later stages verbs and function words may become better markers of language learning. There is a need for information about word frequencies by categories to facilitate the development of adequate language measures, such as the MB-CDI III, for children over 30 months of age. The Swedish MB-CDI III (Eriksson, 2016) contains diverse lexical items such as body functions, mental, and emotional words.

The goals of this study were to identify the types of words by frequency that could compose a Spanish language assessment instrument adequate for children ages 30–47 months of age.

Three lists of words were tested on several groups of Spanish-speaking children. The first was part of the initial study of a Spanish MB-CDI-III. The other lists were developed, using the Eriksson criteria to test new words. Data were collected from: 546 monolingual Mexican children from middle and lower-middle class families and 105 children with language delays, 44 monolingual Guatemalan children from lower income families, and 50 bilingual (Kaqchikel-Spanish) children and. A total of 243 words were tested in several stages to determine frequencies by grammatical and semantic word class. Frequencies of words reported were divided by low, medium and high.

Results indicated different distributions by word categories for each frequency level:

highest frequencies were general action verbs; middle frequencies were mostly mental adjectives and locative/school nouns, more specific action verbs and function words; and the lowest frequencies were all grammatical categories of mental words. Contrasts by word categories were also conducted between monolinguals and bilinguals, low and mid SES and to children with language disorders. These results show the importance of including more diverse word categories in the future development of language assessment instruments.

References

Eriksson, M. (2016). The Swedish Communicative Development Inventory III. Parent reports on language in preschool children. *International Journal of Behavioral Development*, 1–8. 0165025416644078.

Fenson, L., Marchman, V. A., Thal, D. J., Dale, P. S., Reznick, S., & Bates, E. (2007). *MacArthur-Bates Communicative Development Inventories* (2nd Ed.). Baltimore, MD: Brookes Publishing.

Łuniewska, M., Haman, E., Armon-Lotem, S., Etenkowski, B., Southwood, F., Anđelković, D., & Gagarina, N. (2015). Ratings of age of acquisition of 299 words across 25 languages: Is there a cross-linguistic order of words? *Behavior Research Methods*, 48(3), 1154–1177.

36 Acquisition of quantity, relevance and word learning inferences, and their relationship with Theory of Mind

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Recent studies have shed light on factors that affect children's development of quantity, and particularly scalar, implicatures, e.g., the inference that by uttering "I fed some of the ducks" the speaker means some but not all of the ducks (Papafragou & Skordos, 2016). However, we do not know how this relates to the development of relevance implicatures or to word learning by exclusion, often claimed to be a pragmatic inference. In addition, a Gricean understanding of implicatures expects Theory of Mind (ToM) to play a crucial role in inferencing, but this is puzzling given children's apparently early pragmatic development (Breheny, 2006).

In this study, a story-based picture-selection task is used to test scalar, ad hoc quantity, and relevance implicatures, together with word learning by exclusion in English-speaking monolingual children aged 2;8–5;10 (N=71). Measures of ToM are also collected (unexpected contents and Sally-Anne tasks).

Results show that the fourth year of life is crucial for pragmatic development: the youngest children (2;8–3;2) perform above chance only with word learning inferences, but older 3-year-olds are also competent with Ad Hoc and Relevance, but not Scalar, implicatures. This indicates a developmental trajectory of implicature acquisition according with predictions derived from Gricean pragmatic theory. In 3-year-olds, there is a positive correlation between Ad Hoc and Word Learning inferences controlling for structural language ability – this could point either to the pragmatic nature of this word learning strategy, or a shared reasoning by exclusion mechanism. There was no correlation between ToM and implicature performance, with age partialled out. Either another factor (e.g., linguistic difficulty of ToM tasks) is affecting performance, or full ToM (involving false beliefs) is not required for implicature derivation in this kind of task. Contrary to traditional Gricean assumptions, it may be that

some pragmatic competence develops before children can reason fully about others' beliefs.

References

Papafragou, A., & Skordos, D. (2016). Scalar Implicature. In J. Lidz, W. Snyder, & J. Pater (Eds.), *Oxford Handbook of Developmental Linguistics*. Oxford: Oxford University Press. 611-631.

Brehehy, R. (2006). Communication and Folk Psychology. *Mind & Language*, 21(1), 74-107.

37 From chunk to segment: U-shaped patterns in the facilitative effect of frames on children's word production

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While words are often treated as the basic building blocks of language, there is growing evidence for the role of multiword units in language: children and adults are sensitive to multiword information in learning and processing [1]. For instance children are better at producing irregular plurals (e.g., mice, teeth) after frames they often occur with (e.g., Brush your -- teeth, 2). Here, we use this effect to test the usage-based prediction that children draw on multi-word chunks in the learning process [3]. If children's reliance on larger chunks decreases with age, then the effect of frequent frames may be larger early on, then temporarily decrease as children focus on segmentation, until they build up adult like knowledge of the predictive relations between words and phrases. We investigate the developmental relation between phrases and words by looking at the effect of frequent frames (e.g. Brush your -- teeth) on the production of irregular plurals across two years (3;0-5;0, N=68). If children's knowledge is context-sensitive, production should be facilitated following such phrases. If the relation changes with age, we should see a change in the degree to which frequent-frames facilitate production.

We compared irregular plurals elicited with a labeling-question (What are all these?) versus a frequent frame (e.g., Three blind --) in a between-subject design. For each of the target nouns we selected the most frequent two-word frame preceding the noun (based on CHILDES). In both conditions children saw the same pictures and produced only the irregular noun. We use mixed-effect models to investigate the effect of age on performance. The results reveal that age had a u-shaped effect on performance : accuracy was facilitated by the frame in the younger and older children, but not the intermediate ones,

a pattern consistent with a move from chunks to segments. The findings highlight the importance of multi-word information in learning and the need to take context properties into account when assessing children's abilities.

References

Bannard, C., & Matthews, D. (2008). Stored word sequences in language learning: The effect of familiarity on children's repetition of four-word combinations. *Psychological Science*, 19, 241-248.

Arnon, I. & Clark, E. V. (2011). When 'on your feet' is better than 'feet': Children's word production is facilitated in familiar sentence-frames. *Language Learning and Development*, 7, 107-129

Abbot-Smith, K. & Tomasello, M. (2006). Exemplar-learning and schematization in a usage based account of syntactic acquisition. *The Linguistic Review*, 23, 275-290.

38 Do Patterns of Noun and Verb Productions in the Input Influence Spanish- and English-speaking Children's Productive Vocabularies?

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Across languages, early vocabularies often favor nouns (e.g., Bornstein et al., 2004). However, it is unclear whether this early 'noun bias' stems from cognitive constraints (e.g., ease of mapping), linguistic factors (e.g., morphology) and/or cultural practices (e.g., parent production patterns). To ask how these factors may influence vocabulary, naturalistic interactions in Spanish-speaking (Guatemala, Chile, n = 12 dyads) and English-speaking families (US, n = 12 dyads) were recorded and coded for nouns and verbs. Words were counted for Type1 (different words), Type2 (words grouped by related forms) and Tokens (total words).

We used Mixed Model analyses and linear regression to examine the influences of Speaker (mother, child), Language (English, Spanish) and Age on Type1, Type2 or Tokens. In all three Mixed Model analyses, there were significant Speaker by Language by Age interactions, suggesting that there were different patterns in English and Spanish in the mothers' productions as they spoke to younger or older children. For example, in the Types1 analy-

ses, in the English-speaking group, mothers speaking to younger children favored nouns, while both mothers and children in the older group favored verbs. In the Spanish-speaking group, younger children's productions favored nouns, while children and adults in the older group produced an equivalent number of nouns and verbs.

Additional analyses focused on morphology. We found mothers speaking Spanish to younger children produced significantly more inflected verbs than did English-speaking mothers. Children produced more inflected verbs than nouns across languages. Thus, children acquiring Spanish heard a rich system of verb inflections, and were beginning to produce them.

Overall, our data show that across languages, the noun advantage was more apparent in children's productions than in their mothers', and was seen in younger ages. Findings will be linked to cognitive (e.g., Gentner, 1982), linguistic, and cultural factors that likely influence word learning.

References

Bornstein, M. H., Cote, L. R., Maital, S., Painter, K., Park, S. Y., Pascual, L., Pecheux, M., Ruel, J., Venuti, P. & Vyt, A. (2004). Cross Linguistic Analysis of Vocabulary in Young Children: Spanish, Dutch, French, Hebrew, Italian, Korean, and American English. *Child Development*, 75(4), 1115-1139.

Gentner, D. (1982). Why nouns are learned before verbs: Linguistic relativity versus natural partitioning. In Stan A. Kuczaj, II (ed), *Language Development: Volume 2, Language, Thought and Culture*. Hillsdale, NJ: Lawrence Erlbaum Associates.

39 Are there positive consequences of limited vocabulary in children at risk of SLI?

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It is still disputed whether children with specific language impairment (SLI) have limited lexicon or not (e.g. Sheng & McGregor, 2010), although they are clearly said to process both lexical (e.g. Windsor & Hwang, 1999) and non-verbal stimuli (e.g. Schul et al., 2003) slower than their typically developing (TD) peers. Here we investigate whether Polish children at risk of SLI know less words and are indeed slowed in lexical processing.

We tested two groups of monolingual children: SLI-risk children (n = 25, aged 6;0±0;7) and an age-matched TD control group (n = 26). With the use of a Polish version of Cross-Linguistic Lexical Task (CLT), we examined word knowledge and lexical processing. CLT assessed comprehension (picture-choice task) and production (picture naming task) of nouns and verbs. Additionally, we measured reaction times (RTs) in both tasks.

We performed two repeated-measures ANCOVAs with either accuracy or RT as dependent variables, type of task and part of speech as within-subject factors, group as between-subject factor and age as a covariate. We found that accuracy was higher in comprehension than in production and in nouns than in verbs. A significant interaction of group*task revealed that SLI-risk children scored lower than TD especially in the production task.

Concerning the RTs, we observed a significant effect of type of task (i.e. picture naming was faster than word recognition) and part of speech (answers for nouns were quicker than for verbs). Additional post-hoc analyses revealed a significant group effect only in production: SLI-risk children were faster in picture naming than TD.

We conclude that although SLI-risk children have limited lexicon, they seem to be even more efficient in word finding (for words they know anyway). We suggest that faster access to known words in SLI children may partially compensate the deficits in higher language skills.

References

Sheng, L., & McGregor, K. K. (2010). Lexical-semantic organization in children with specific language impairment. *Journal of Speech, Language and Hearing Research*, 53(1), 146.

Schul, R., Stiles, J., Wulfeck, B., & Townsend, J. (2003). How 'generalized' is the 'slowed processing' in SLI? The case of visuospatial attentional orienting. *Neuropsychologia*, 42, 661 – 671.

Windsor, J., & Hwang, M. (1999). Testing the Generalized Slowing Hypothesis in Specific Language Impairment. *Journal of Speech, Language, and Hearing Research*, 42(5), 1205-1218.

40 High Frequency Words Help Infant Language Acquisition

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A key challenge facing language learners is identifying words and grammatical rules from continuous speech. Past research has suggested that these tasks benefit from infants' ability to extract transitional information from speech and use it to infer word boundaries and linguistic regularities. Critically, studies suggest that infants' statistical language learning may benefit from the use of high-frequency marker words (Bortfeld et al., 2005) that may act as anchors around which speech segmentation can occur, while also assisting with grammatical categorisation (Monaghan & Christiansen, 2010).

To test these claims, we familiarised 12-month-olds with a continuous stream of speech comprising repetitions of 4 bisyllabic target words, and compared learning to the same language but with high-frequency monosyllabic marker words preceding target words, and distinguishing them into two distributionally-defined categories. In a further condition, we examined whether learning was improved when marker words appeared alongside target words that contained phonological cues, which also indicated category membership.

We assessed infants' ability to segment the speech by using a head-turn preference task to monitor looking times to words versus part words. We also examined whether infants used the high frequency marker words to help them form grammatical categories. For this, we measured looking times to short streams of words containing items from the same versus different grammatical categories. For both tests, gaze direction and duration was measured using video recording and eye-tracking. Preliminary analysis indicates that for 12-month-olds, high frequency words did not assist speech segmentation, but did influence the formation of grammatical categories. The results indicate that infants can use high frequency words to learn about grammatical categories while they are still learning to segment speech.

References

- Bortfeld, H., Morgan, J.L., Golinkoff, R.M., & Rathbun, K. (2005). Mommy and me: familiar names help launch babies into speech-stream segmentation. *Psychological Science*, 16, 298-304.
- Monaghan, P. & Christiansen, M. H. (2010). Words in puddles of sound: modelling psycholinguistic effects in speech segmentation. *Journal of Child Language*, 37, 545-564.

41 Both mental state language and grammatical skills predict children's use of personal pronouns and verb inflections for person

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The emergence of personal pronouns has been considered as a sign of emerging social understanding and self-other differentiation. However, personal pronouns are also linguistically complex. It is thus a question whether the initial use of personal pronouns in children marks advances in social understanding, or whether it reflects general linguistic development. The same question may be asked for other devices of person reference, such as conjugated verb forms in languages that inflect verbs for person. The present study addressed these questions in a group of children acquiring Czech, using mental state language words as a proxy measure of social understanding.

The study analyzed language samples of 58 children aged 29 to 31 months, as well as lexical and grammatical comprehension tasks. Language samples were searched for all occurrences of words from three lists, first and second person pronouns (8 word forms each), and 37 different words referring to mental states. In addition, number of occurrences of all first- and second-person present tense forms of verbs were counted.

Regression analyses used the number of occurrences of first and second person pronouns as the dependent variable. The predictors were the mean length of utterance (MLU) and the number of mental state language (MSL) tokens. The effect was significant for both MLU ($\beta=0.36$, $p=0.003$) and MSL ($\beta=0.36$, $p=0.002$), suggesting that each predictor has a unique contribution to the prediction of personal pronoun use. The use of verb conjugation for person reference showed similar relations to MSL and MLU as pronouns, with both language complexity and mental state language having independent effects on person reference.

Results confirmed that children's pronominal and verb-form person reference is related both to language development and to the development of social understanding. Studies using person reference to assess children's social understanding should always take into account the overall linguistic development.

42 Acquisition of case inflection of nouns in Czech – a parent-report study

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Our poster presents data about acquisition of case inflection of nouns spontaneously produced by children between 18 and 48 months of age. The study is part of a larger project focused on explanatory description of acquisition of various grammatical phenomena in Czech, as there are almost no empirical studies concerning this issue.

The research is based on parental-report method (e.g. Fenson et al., 2007), which is predominantly used for the assessment of vocabulary. Our study newly extends the use of parental reports to the study of function words and grammatical morphemes. We collected the data through a web-based mother-report questionnaire.

Besides the cases of nouns, we included questions about children's expressive vocabulary and grammatical complexity of their utterances. Some demographic data were collected as well. We obtained data on 117 children (average age 33.44 months).

Our research aim was to set an order of acquisition of individual cases, and to examine factors influencing this order, e.g. frequency of cases (e.g. Goodman et al., 2008), semantic and grammatical complexity, demographic factors.

The analyses conformed that the total number of acquired cases strongly correlates with the age of children, but even more with children's expressive vocabulary and grammatical complexity of their utterances (e.g. Marchman et al., 2004). Mixed-effects logistic regression showed that these three variables have a strong independent effect on number of cases produced by children.

Random effects from the mixed logistic model were used to estimate relative difficulty of individual cases. On the basis of relative difficulty, we set an order of acquisition of cases. The results indicate that the order of acquisition of cases is different for animate and inanimate nouns.

The linear model analyses did not reveal any effect of demographic factors, such as gender, birth order and parent education, on the order of acquisition.

References

Fenson, L., Marchman, V. A., Thal, D. J., Dale, P. S., Reznick, J. S., & Bates, E. (2007). MacArthur Com-

municative Development Inventories: User's Guide and Technical Manual (Second edition). Baltimore: Paul H. Brookes Publishing.

Goodman, J. C., Dale, P. S., & Li, P. (2008). Does frequency count? Parental input and the acquisition of vocabulary. *Journal of child language*, 35(03), 515–531.

Marchman, V. A., Martínez-Sussmann, C., & Dale, P. S. (2004). The language-specific nature of grammatical development: evidence from bilingual language learners. *Development Science*, 7(2), 212–224.

43 Can frequent frames in Child Directed Speech (CDS) assist children in acquiring the complex structure of the verbal paradigm in Hebrew?

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Hebrew, as a Semitic language, is featured with non-linear morphology. Verbs are created of radical elements inserted into one of seven binyan patterns. How do children acquire the verbal morphology in Hebrew? Under the usage-based assumption the suffice information should be present in children's input. We need to ask further, which aspects of the input assist them in acquiring this complex system? A corpus study has suggested that the input to children contains representative information about the verbal paradigm as for exemplars of different binyanim and roots (Ashkenazi et al., 2016). But, children do not have access to the whole corpus at once. Rather, they get the input gradually and the learning process happens continually. Thus, we looked at frequent frames in CDS as providing the relevant information about the verbal paradigm. Frequent frames (repeated multiword patterns constructed of one to three morphemes or words) are a characteristic of CDS (Cameron-Faulkner et al., 2003) and they were also found to facilitate processing (e.g. Bannard & Matthews, 2008). In the current work, a corpus study was conducted; we looked at CDS in Hebrew to children aged 1 to 2:6. We identified 10 most frequent bigrams which predict a verb to follow and found that (A) Frequent frames as a group provide representative information of the verbal paradigm: In number of different roots and their meaning, as well as exemplars of the different binyanim, resembling the entire corpus. (B) Each frame carries slightly different information (e.g. different frames are predictive to different roots) and (C) There is a variation in the root-based infor-

mativity each frame holds. Thus, children can lean on frequent frames in their input in order to gather the information needed for acquiring the verbal morphology in Hebrew.

References

Ashkenazi, O., Ravid, D., & Gillis, S. (2016). Breaking into the Hebrew verb system: A learning problem. *First Language* 36 p. 505-524

Bannard, C., & Matthews, D. (2008). Stored word sequences in language learning the effect of familiarity on children's repetition of four-word combinations. *Psychological science*, 19(3), 241-248.

Cameron-Faulkner, T., Lieven, E., & Tomasello, M. (2003). A construction based analysis of child directed speech. *Cognitive Science*, 27(6), 843-873.

44 Why do English infants not show a consonant bias

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Nespor and colleagues (2003) have proposed that consonants, and not vowels, cue lexical processing. Evidence from adults speaking various languages and children (Nazzi et al., 2016) confirm this consonant bias in lexical processing. English children, however, do not show such a consonant bias until quite late compared to their French peers.

A more recent proposal suggested that the consonant bias arises for words where the number of consonant skeleton neighbours (such as f-sh in fish) is reduced or unique (in English only fish has such a consonantal structure, Delle Luche et al., 2014). Stimuli used with English infants usually contain a shared consonant skeleton, which would fail to give rise to a consonant bias.

We tested this hypothesis with a familiar word recognition paradigm, where two pictures are presented side by side on a screen while children's eye movements are tracked. Halfway into each trial, one of the objects is named: successful word recognition leads to longer looking times after naming. Half of the target items had no familiar consonant skeleton neighbours (e.g., fish) and the other half had some (e.g., cat, with cot, cut, coat). In line with adult behavioural results, a latency difference is expected: words with a unique consonant skeleton show a consonant bias and are recognised faster. This advantage should also translate in higher pro-

portion of looks to these unique skeleton words. Children were tested at 24 months, an age where no consonant bias has been found in English so far.

Preliminary results indicate that words with no consonant skeleton neighbours are processed differently than words that have such neighbours: they are better recognised.

The consonant bias arises from a more informative, highly selective consonant skeleton. A control group, at 30 months, will be tested as well, to verify if this informativity effect becomes stronger.

References

Delle Luche, C., Poltrock, S., Goslin, J., New, B., Floccia, C., & Nazzi, T. (2014). Differential processing of consonants and vowels in the auditory modality: A cross-linguistic study. *Journal of Memory and Language*, 72, 1-15. doi:10.1016/j.jml.2013.12.001

Nazzi, T., Poltrock, S., & Van Holzen, K. (2016). The developmental origins of the consonant bias in lexical processing. *Current Directions in Psychological Science*, 25(4), 291-296. doi:10.1177/0963721416655786

Nespor, M., Peña, M., & Mehler, J. (2003). On the different roles of vowels and consonants in speech processing and language acquisition. *Lingue e Linguaggio*, 2, 203-229.

ZONE 3

45 (Dis)Embodied Speech: Developing Speech Perception With(Out) Sensorimotor Information

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Growing evidence highlights contributions of sensorimotor information to speech perception from infancy to adulthood (2,3). It appears then worth to investigate the effects of acquiring speech in adverse sensorimotor conditions.

Childhood Apraxia of Speech (CAS) is a congenital neurogenic disorder in which precision and consistency of speech movements are impaired in the absence of neuromuscular deficits.

CAS children are unable to correctly plan and program voluntary phono-articulatory movements; this makes their productions not only inaccurate (sometimes hardly intelligible) but also highly variable, ultimately hindering the mapping between articulatory gestures and their acoustic consequences.

This study addresses the following issue: does this developmental failure in integrating sensorimotor and auditory components of speech affect speech perception? Former studies provide evidence of perception deficits in this population, but with reference to auditory-only stimuli. This is the first attempt to extend the analysis to the audiovisual dimension.

We aimed at assessing (i) if CAS children are able to rely upon visual cues in speech and (ii) if correlations are appreciable between proficiency in this aspect and speech motor control abilities. 30 adults, 25 language-matched typical children and 25 children with CAS undertook the following procedure.

(a) Perception task: forced-choice speech-in-noise (white noise, SNR 0dB) audiovisual discrimination task, contrasting CV syllables in two conditions: high vs. low visual cue (/ba/ /ga/; /da/ /na/); easy-vs. difficult-to-articulate consonants (/da/ /na/; /dʒa/ /dʒa/).

(b) Production task: Maximum Performance Rate Task assessing rate, accuracy and consistency with and without auditory masking (absence of acoustic feedback).

Preliminary analyses (30 adults, 22 typical-children, 15 CAS-children) highlight: (i) clear difficulties for the CAS group in speech-in-noise perception; (ii) a decay in their performance with Cs characterized by a high phono-articulatory load; (iii) promising (still preliminary) correlations between their performance in tasks (a) and (b). Younger (language-matched) typical subjects displayed similarities with the CAS group, but also significant differences.

References

- Groenen P., Maassen B., Crul T., Thoonen G. (1996). The Specific Relation Between Perception and Production Errors for Place of Articulation in Developmental Apraxia of Speech. *Journal of Speech and Hearing Research*, 39(3), 468-482.
- Skipper J.I., Devlin J.T. & Lametti D.R. (2017). The hearing ear is always found close to the speaking tongue: Review of the role of the motor system in speech perception. *Brain & Language*, 164, 77-105.
- De Paolis R.A., Vihman M.M., Keren-Portnoy T. (2010). Do production patterns influence the processing of speech in prelinguistic infants? *Infant Behavior and Development*, 34(4), pp. 590-601.

46 Language abilities in preterm-born children : Specific difficulties in phonological skills

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Children who were born prematurely (before 37 weeks' gestation) are at greater risk for a range of impairments in cognitive, motor, social-emotional, and academic functioning (e.g., Bos et al., 2013). Other developmental disorders, such as language delays and deficits, are also more common in preterm children (Francken et al., 2012). Because language function is essential in all kinds of social and academic life (Young et al., 2002), it is crucial to better identify and characterize language impairment in preterm-born children. Despite the large amount of research conducted on language abilities in preterm children, little is known about their phonological development (Barre et al., 2011). In the present study, we investigated differences in several phonological tasks between French-speaking premature children and in term-born control children.

30 children born at <35 weeks' gestation (4 to 5 years old) and with low-birth weight (1215 g on mean) were recruited. These preterm children were matched to 30 children born at term on gender, chronological age and socio-economic level. All participants were administered five language tasks (phonemic discrimination, phonological judgment, pictures naming, pseudo-words repetition and phonological awareness) in order to precisely assess their phonological skills.

Results indicated that preterm children presented poorer performance than control term-born children when they had to discriminate between different phonemes (phonemic discrimination abilities), to detect phonemic modifications (phonological judgment) and to recognize and identify syllabic segments (phonological awareness). Differences between both groups have also been observed in the quality of phonological representations (pictures naming task). However, both groups of children performed equally well in the pseudo-words repetition task.

These findings revealed that preterm children score significantly lower compared with term-born children on several phonological tests, a language sub-domain which is particularly important in the initial stages of language development and for reading.

References

- Barre, N., Morgan, A., Doyle, L.W., & Anderson, P.J. (2011). Language abilities in children who were very preterm and/or very low birth weight: A meta-analysis. *The Journal of Pediatrics*, 158(5), 766-774.
- Bos, A. F., Van Braeckel, K. N. J. A., Hitzert, M. M., Tanis, J. C., & Roze, E. (2013). Development of fine motor skills in preterm infants. *Developmental Medicine and Child Neurology*, 55(Suppl. 4), 1-4.
- Franken, M. C. J., & Weisglas-Kuperus, N. (2012). Language functions in preterm-born children: a systematic review and meta-analysis. *Pediatrics*, 129(4), 745-754.

47 Early phonetic production patterns and novel word learning

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In recent years studies have reported an early relationship between infants' production of vocal patterns (specifically on the basis of well-practiced sounds, vocal motor schemes-VMS) and their perceptual processing of linguistic input (De Paolis et al., 2011). However, less attention has been given to a one possible effect of infants' early phonetic patterns to the ability of map new word onto one object and maintain the representation over time after only a few exposures. The present study aimed to assess the relationship, if any, between children's emerging phonetic abilities and their ability to learn trained nonwords.

Thirty monolingual Italian-learning infants (12 males and 18 females) were observed with home recordings twice at around 11 months, to assess their consonant production. According to their production, children were divided into two subgroups (VMS-group and noVMS-group). The children were then tested using an adaptation of the preferential looking paradigm (Hirsh-Pasek & Golinkoff, 1996), after training on nonwords associated with picture-book images (VMS-images and noVMS images) of imaginary animals (over 5 sessions in a week). Each child had to learn four nonwords, two containing bilabial sounds usually produced by infants (VMS-nonwords) and two containing sounds not typically produced for that age (noVMS-nonwords). The perceptual testing involved pairs of pictures included in the book (trained words) or not (foils) and the trained words were presented (16 trials altogether). Looking times (LT) and numbers of responses in matched and unmatched conditions were as-

sessed. Analysis showed that both the groups displayed a novelty effect when the foil-image is compared to VMS-image [$F(1, 28) = 9.06$; $p = .005$, $\eta^2 = .83$]; children who display stable, high-frequency production of sounds looked longer in response to the trained words with VMS-consonants [$t(17) = 2.42$; $p = .02$] than did infants with lower production of those sounds. In order to assess specifically the relationship between the child's production and the child's ability to recognise words containing the same sounds we consider a perception index and we tested the relationship with the occurrences of sounds in preverbal speech. The analysis showed a significant relationship between them [$r(30) = .36$; $p = .04$]. These results support the idea of a specific link between the child's early phonetic competence and her/his ability to recognise trained new words.

References

- DePaolis, R., Vihman, M. M. & Keren-Portnoy, T. (2011). Do production patterns influence the processing of speech in prelinguistic infants? *Infant Behavior and Development*, 34(4), 590-601.
- Hirsh-Pasek, K., & Golinkoff, R. M. (1996). The preferential looking paradigm reveals emerging language comprehension. In D. McDaniel, C. McKee, & H. Cairns (Eds.), *Methods for assessing children's syntax* (pp. 105-124). Cambridge, MA: MIT Press.

48 Characteristics of Phonological Development in Preschool-aged Russian-Finnish Bilinguals

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The research addresses the phonological development in Russian-Finnish bilingual children of pre-primary age, it attempts to disentangle the characteristics of normal bilingual phonological development from those characteristics of monolinguals and SLI (Specific Language Impairment)-children (Paradis 2010).

The study combines qualitative and quantitative methods in the framework of child language development studies, contrastive and contact linguistics. It also takes into account language therapy approaches. The data were collected through an articulation test specially designed for Russian and Finnish.

The research is based on the results of both longitudinal and cross-sectional studies. The longitudinal study observes the evidence from 6 normally developing bilingual children in a 2.5-year time period. The sample of the cross-sectional study con-

sists of 120 children divided into three groups: (1) 40 typically developing Russian-Finnish bilinguals; (2) 40 typically developing Russian monolinguals and 20 typically developing Finnish monolinguals; and (3) 20 Russian-Finnish bilinguals with SLI. The participant's production of target words was transcribed and phonetic and phonological errors were analysed (independent and relational analysis; Stoel-Gammon 1985).

The analysis reveals that from a longitudinal perspective, phonological development is faster and easier for bilinguals in Finnish than in Russian. However, relatively simple Russian vocalism is acquired faster than Finnish vocalism, whereas the complex system of Russian consonants takes longer to develop than the Finnish consonant system. Furthermore, language-specific features appear to be the most problematic for acquisition. The research shows the evidence of language interaction in bilingual phonological development, e.g. in the form of cross-language phonetic interference. As a result, some bilingual children may have either a Russian or a Finnish accent. However, this accent tends to gradually disappear. As predicted, bilingual language acquisition demonstrates predominantly deceleration in the acquisition of Russian and Finnish phonological systems. Nevertheless, bilinguals showed a few cases of accelerated sound acquisition in Finnish and in Russian.

References

Paradis, J. (2010). The interface between bilingual development and Specific Language Impairment. *Applied Psycholinguistics* 31, 227-252.

Stoel-Gammon, C. (1985). Phonetic inventories, 15-24 months: A longitudinal study. *Journal of Speech and Hearing Research* 28(4), 505-512.

49 Voicing contrast in Nepali infant-directed speech

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Studies investigating oral stops in IDS and ADS have analysed voice onset time (VOT), a significant acoustic correlate for voicing contrasts in word-initial stops. These studies present mixed results regarding the presence of exaggeration of VOT in IDS.

However, there have been no studies of VOT in IDS in a language with a four-way contrasts of voicing in oral stops. It therefore remains unclear how this type of VOT contrast may be realized in IDS. For this

reason, the current study investigates IDS in Nepali, a language with a four-way contrasts of voicing in oral stops: voiced unaspirated and aspirated, and voiceless unaspirated and aspirated.

In the present study, 15 mother-infant and mother-adult dyads were audio recorded in a sound treated room. They were asked to play with four target minimal pair objects, each contrasting in voicing (/ga.ɖa/ 'bullock cart', /gʰa.ɖi/ 'neck', /ka.ɖa/ 'hairpin', and /kʰa.na/ 'food'). At first, mothers were asked to play with their infant (Mean age = 14.13 months, range = 10 to 17 months) using the target pictures, thereby eliciting IDS. Secondly, to elicit ADS, mothers were asked to interact with the adult-experimenter. Acoustic analysis was then carried out for all word initial stops in the target words that occurred in sentence initial position or in isolation, in both IDS and ADS.

We hypothesized that there would be an exaggeration of voicing contrasts in IDS compared to ADS. This exaggeration might be realized as higher negative VOT in prevoiced (voiced) stops and higher positive VOT in voiceless stops in IDS compared to ADS.

The results showed that contrary to our expectations, the voicing cues in IDS is significantly shorter than ADS for all stop categories. This could not be explained by speaking rate differences between the register. Further analysis showed IDS had significantly shorter consonant to syllable length ratio.

The results suggest that exaggeration is not inherent to IDS. Contrary to speaking rate difference, the voicing cues are shorter in IDS. The results suggest that mothers when talking to infants exaggerated the following vowel duration at the expense of consonant length. Overall, this study suggests that the relation between the voicing cues and register may not be so straight forward and there may be something going on with the other cues or factors, so one must look at the bigger pictures to understand how the register works.

References

Sundberg, U. (2001). Consonant specification in infant-directed speech. Some preliminary results from a study of Voice Onset Time in speech to one-year olds. *Working Papers*, 29, 148-151.

McMurray, B., Kovack-Lesh, K. A., Goodwin, D., & McEchron, W. (2013). Infant directed speech and the development of speech perception: Enhancing development or an unintended consequence? *Cognition*, 129(2), 362-378. doi: <http://dx.doi.org/10.1016/j.cognition.2013.07.015>

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Realization of Vowels and Tones in Northern Mandarin Infant-directed Speech and Lombard Speech

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Vowels and tones are hyperarticulated in infant-directed speech (IDS) in Taiwan Mandarin [1] and speech in noise (Lombard speech) in Cantonese [2]. However, little is known about how these registers affect vowels and tones in Northern Mandarin.

This study investigated the realization of vowels (/a/, /i/ and /u/) and tones (T1-4) in Northern Mandarin IDS and Lombard speech. Fifteen Northern Mandarin-speaking mother-infant dyads (12-month-olds) were recruited. Seven picturable disyllabic words were chosen as the carriers of the target vowels (word-initial) and tones (word-final), associated with seven corresponding toys. Mothers played with the toys while talking to their infant, and then talked with a Mandarin-speaking adult about the toys, first in quiet, and then in noise (70dB babble noise). Vowel space was hypothesized to be expanded and tones were hypothesized to be hyperarticulated (higher pitch, larger pitch range and longer duration) in both registers.

As expected, the vowel space was expanded in both IDS and Lombard speech. Yet the shift went in different directions, i.e., forward and downward in IDS and backward and downward in Lombard speech. Overall pitch of the tones was highest in IDS, followed by Lombard speech, relative to ADS. Pitch range and duration were only larger and longer for tones in sentence-final position in IDS.

The results provide evidence for hyperarticulation in IDS and Lombard speech. Despite a larger vowel space in Northern Mandarin than Taiwan Mandarin, vowels were expanded in the former. This indicates vowel hyperarticulation of IDS across dialects. However, tone hyperarticulation observable only in sentence-final position shows dialect-specificity in IDS. Unlike Northern Mandarin IDS, Lombard speech exhibited vowel and tone hyperarticulation consistent with findings in Cantonese. The different effects of registers are discussed in terms of its impact on tone and vowel learning in the typically-developing and hearing-impaired children.

References

Liu, H. M., Tsao, F. M., & Kuhl, P. K. (2007). Acoustic analysis of lexical tone in Mandarin infant-directed speech. *Developmental Psychology*, 43(4), 912.

Zhao, Y., & Jurafsky, D. (2009). The effect of lexical frequency and Lombard reflex on tone hyperarticulation. *Journal of Phonetics*, 37(2), 231-247.

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Comprehension of focus structures in Mandarin Chinese- an eye-tracking study with 5-year-old children

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The questions how information structure (IS) affects the structure of verbal utterances and how listeners interpret the cues related to IS have been explored for decades but it still remains unclear how Mandarin-speaking children implement IS to understand focus. Focus indicates the presence of alternatives in the current discourse and it can be marked by syntactic or prosodic means (Rooth, 1992). In Mandarin - as a tone language - the relevance of prosody to mark IS is questionable. Previous research indicates that Mandarin speakers (adults and children) apply acoustic parameters i.e. fundamental frequency and duration to mark IS in sentence production (Yang and Chen, 2014). Most interestingly, Chen found that Mandarin-speaking children relied more heavily on stress than adults to identify focus in a picture verification task. She assumed that children switch their strategy from a prosodic one to a structural one based on word order during language acquisition (Chen, 1998).

In this study, the visual world paradigm with a speech production task was employed to investigate how Mandarin-speaking children understand focus structures, i.e. the cleft construction and the canonical sentence with an element bearing focal stress. The pictures were designed so that participants could correct either the Subject NP or the Object NP, depending on the assignment of the focus element. There were three conditions, one prosody condition (Subject-accented), and two syntax conditions (Cleft-Subject and Pseudocleft-Object). 58 5-year-old Mandarin-speaking children and a control group of 56 Mandarin-speaking adults were tested. The results showed that both Mandarin-speaking adults and children were not sensitive to prosodic information but relied on syntactic in-

formation to identify the focus. The findings of the present study are in striking contrast to those of Chen (1998), suggesting that children learning Mandarin Chinese have an adult-like stronger weighting of syntactic over prosodic cues as markers of focus from early on.

References

- Rooth, M. (1992). A theory of focus interpretation. *Natural language semantics*, 1(1), 75-116.
- Yang, A., & Chen, A. (2014). Prosodic focus marking in Chinese four- and eight-year-olds. In *Speech prosody* (Vol. 7, pp. 713-717).
- Chen, S. H. E. (1998). Surface cues and the development of given/new interpretation. *Applied Psycholinguistics*, 19(04), 553-582.

ied extensively for English, an equivalent research for quantitative SES studies on German-speaking families is non-existent.

Requests vary across languages, but most of the world's languages, including German, use imperatives. In German, a less-widespread category of infinitives is also used to express imperative meanings (e.g. *aufhören!* '[to] stop!'). Those are perceived as being particularly brusque and "presuppose immediate compliance" (Aikhenvald 2010: 281). We, therefore, investigated the use of requests in child-speech and child-directed speech of 116 30-minute longitudinal spontaneous speech recordings conducted with 29 German-speaking children (15 HSES, 14 LSES, aged 2;11-4;11) and their parents.

Linear-mixed effects analyses of directive speech acts show that real questions were clearly preferred by HSES parents, where LSES parents used significantly more requests. SES effects were strongest in direct requests in forms of infinitives with imperative meanings, followed by imperatives, both in children and parents. Not only imperatives, but especially infinitives with imperative meanings, may thus be regarded as SES markers of German CDS and CS.

Greater SES differences in most categories were found between parents than between children, suggesting that SES-determined speech is a usage-based norm that children will grow into when getting older.

References

- Aikhenvald, A. Y. (2010). *Imperatives and Commands*. Oxford: Oxford University Press.
- Hoff, E. (2003). Causes and Consequences of SES-Related Differences in Parent-to-Child Speech. In: M. Bornstein & R. Bradley (eds), *Socioeconomic Status, Parenting, and Child Development* (pp. 147-160). Mahwah, NJ: Erlbaum.
- Tomasello, Michael (2010). *Origins of Human Communication*. Cambridge, MA: MIT Press.

55 Adolescent First-Language Acquisition of Word Order in American Sign Language

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Basic word order has repeatedly been found to be unaffected by age of acquisition (Newport 1990). But it is not an easy task, especially when the language has a variety of word orders. American Sign Lan-

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54 "Aufhören!" Infinitives with imperative meanings as SES markers of German child-directed speech (CDS) and child speech (CS)

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Parenting styles are largely reliant on socioeconomic status (SES) of the parents, and while those who belong to higher SES (HSES) backgrounds preferably follow conversation-eliciting parenting strategies, parents from lower SES (LSES) tend to use a more behavior-directing style (Hoff 2003). These disparities in parenting styles are most apparent in requestive speech acts. Requests provide a good testing ground for the social-interactional underpinnings of the acquisition of requests in young children and for SES differences for two reasons: First, requests appear in different frequencies in HSES and LSES families. Second, requests tend to be expressed differently in both types of families. While the use of requests has been stud-

guage, ASL, uses a basic Subject-Verb-Object (SVO) order, but also employs word order variations under certain morphological and pragmatic conditions. Child learners produce variable word order at the initial, multi-word stage of ASL acquisition, but then go through a re-analysis stage when they primarily produce canonical word order. In the present study, we asked whether adolescent L1 learners acquire word order in the same way as young child learners.

We analyzed spontaneous language samples from four adolescent L1 learners collected longitudinally from 12 months to 5 years of ASL exposure. The language samples were transcribed into ELAN and their reliability checked by deaf, native signers. We selected intelligible and unambiguous verb phrases that involve one or more nominal arguments. We coded and analyzed the relative word order in subject-verb combinations and in verb-object combinations separately, following analysis procedures used in previous studies to facilitate comparison (Pichler 2001; Lillo-Martin & Berk 2003).

The results show that the adolescent L1 learners follow a developmental trajectory similar to that of child learners. At the initial, multi-word stage of acquisition they use variable word order. They later progress to a re-analysis stage where they primarily use canonical word order. However, unlike young children, the adolescent L1 learners took significantly more time to reach the generalization stage. This slowed trajectory of word order acquisition contrasts with their initially fast rate of lexical acquisition compared to that of young children.

To conclude, these results suggest that word order acquisition and overgeneralization from variable input is possible for adolescent L1 learners, but the process is extended and shows little evidence of moving beyond this overgeneralization stage.

References

- Lillo-Martin, D., & Berk, S. (2003). Acquisition of constituent order under delayed language exposure. In *Proceedings of the 27th Annual Boston University Conference on Language Development* (Vol. 2, pp. 484-495). Somerville, MA: Cascadilla Press.
- Newport, E. L. (1990). Maturation constraints on language learning. *Cognitive Science*, 14(1), 11-28.
- Pichler, D. C. (2001). Word order variation and acquisition in American Sign Language.

English-speaking children overextend the preposition from to mark many types of oblique arguments, including demoted agents (e.g., Anna got bitten from a crocodile, F3;3) and standards of comparison (e.g., The elephant is heavier from the rabbit, M3;3). Clark and Carpenter (1989) argue that these overextensions cannot be explained by the adult input and that children subsume locative sources, agents, causes, possessors, and standards of comparison (comparison) under a conceptual category of source and therefore mark all these arguments using the same preposition, namely from.

According to this explanation, we should see similar overextensions in typologically similar languages. In this study, I focus on the early expression of comparison by German- and English-speaking children. In German, adults never use von ('from') to mark comparison whereas many English-speaking adults use from with the comparative different. If children's overextensions are independent of the adult input, we expect German-speaking children to express comparison with von. If, however, English-speaking children simply overextend different from, then these overextensions should be limited to English. I investigated all uses of comparison in six German and seven English longitudinal corpora. No German-speaking child ever used von, whereas three English-speaking children used from with comparatives such as better and longer as well as different. I obtained similar results in an elicitation task (German: n = 7, ages 3;4-4;3, English: n = 9, ages 2;8-4;2): no German-speaking child used von but three English-speaking children used from, which indicates a significantly lower rate of use of von with comparatives in German (BF=6.32 using a Bayesian hypothesis test (Lee and Wagenmakers, 2014, Ch. 9)).

I conclude that the use of from with comparison is not independent of the adult input and that the non-conventional uses of from to mark comparison are best explained by assuming that English-speaking children overextend the construction different from.

References

- Clark, E. V. and Carpenter, K. L. (1989). The notion of source in language acquisition. *Language* 65(1). 1-30.
- Lee, M. D., and Wagenmakers, E. (2013). *Bayesian Cognitive Modeling*. Cambridge: Cambridge University Press.

56 Early Marking of Standards of Comparison in English and German

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57 Beyond subject/object asymmetry: Mandarin-speaking children's processing of different relative clause types

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Mandarin is unusual among SVO languages in having pre-nominal RCs, resulting in processing demands competing in opposite directions: Mandarin subject RCs are less costly to process due to general subject prominence, but more costly in terms of longer filler-gap linear distance. Most studies focus only on subject and object RCs in child Mandarin. However, the other RC types using resumptive pronoun (RP) rather than gapping strategy are largely under-explored. This study is the first to examine a wide range of relativized positions including Subject(S), Agent(A), Patient(P), Indirect Object(IO), Oblique(OBL) and Genitive(GEN).

Generally, we predict S is easy but GEN is difficult to process, cross-linguistically. Specifically, for Mandarin, we predict differential difficulty within Mandarin IO-RCs: IO-RCs using prepositional datives are more difficult than IO-RCs using double object datives, because the former are structurally ambiguous. We also predict high accuracy with OBL-RCs: their processing is supported by frequently used serial verb constructions (SVC) as a subpart construction, because using a RP causes the RC to be isomorphic to SVC. Additionally, pronoun resolution is easy because the preposition and its following RP serve as an informative local cue (Bates & MacWhinney 1987).

We used a sentence repetition task to assess production of S-, A-, P-, IO-, OBL-, and GEN-RCs in 113 Mandarin three-, four- and five-year olds (Diessel & Tomasello 2005). Results with S, GEN, IO, OBL were as predicted. Additionally, A was significantly better than P, consistent with recent experimental findings (Hu et al 2015). The difficulty ranking is S>A=OBL>P>GEN ('> easier'), and IO (double object datives) > IO (prepositional datives). The developmental phenomena demonstrate how general constraints such as general subject prominence, syntactic and semantic complexity, cues to reference resolution, and their interactions with language-specific characteristics like structural overlap with simpler constructions jointly influence the processing of Mandarin RCs in children.

References

Bates, E., & MacWhinney, B. (1987). Competition, variation, and language learning. In B. MacWhinney (Ed.), *Mechanisms of Language Acquisition* (pp. 157-193). Hillsdale, NJ: Erlbaum.

Diessel, H., & Tomasello, M. (2005). A new look at the acquisition of relative clauses. *Language*, 18, 882-906.

Hu, S., Gavarró, A., & Guasti, M. T. (2016). Children's production of head-final relative clauses: The case of Mandarin. *Applied Psycholinguistics*, 37(02), 323-346.

58 Children's evaluation of reasonableness of others in argumentation

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The key evolutionary function of language is to facilitate cooperation between individuals (Tomasello, 2008). In situations of joint decision-making, partners that share a joint goal but disagree on their strategy can communicate about their options through language to reach the best decision. In these contexts, being reasonable means accepting good arguments and rejecting bad ones. Although it is known that children selectively trust informants who provide good arguments more than those who provide bad arguments (e.g., Harris, 2007; Koenig, 2012), we specifically investigated whether 5- and 7-year-olds can evaluate other people's evaluations of good vs. bad arguments – an advanced meta-argumentative skill. Children were asked to pick a partner to succeed in a cooperative game. They saw a short picture story presenting two candidates engaging in joint problem solving (finding a missing paint brush). Both candidates heard two contradicting arguments from two informants for why to search for it in a specific box. In the test condition, a strong perceptual argument ("because that's where I last saw it") was pitted against a weak preference argument ("because that box is my favorite color"), with each candidate accepting either, which thus identified them as reasonable or unreasonable/gullible partners. In the control condition, two similarly good arguments were given to candidates. Importantly, both informants and candidates to partner choice were shown to children to have false beliefs about where the brush really was, to prevent children from attributing knowledge to either. Our results suggest that in the test condition, 7-year-olds preferred the reasonable partner, whereas 5-year-olds showed just a trend in this direction. In the control condition, both age groups preferred each partner equally. This sug-

gests that children exhibit the meta-argumentative skill of evaluating others' evaluations of arguments starting towards the 6th birthday and with great reliability at 7 years.

References

Harris, P. L. (2007). Trust. *Developmental Science*, 10(1), 135–138. <http://doi.org/10.1111/j.1467-7687.2007.00575.x>

Koenig, M. A. (2012). Beyond semantic accuracy: preschoolers evaluate a speaker's reasons. *Child Development*, 83(3), 1051–1063. <http://doi.org/10.1111/j.1467-8624.2012.01742.x>

Tomasello, M. (2008). *Origins of Human Communication*. (F. Recanati, Ed.). Cambridge, MA: MIT Press.

59 Predicting language outcome and school readiness at 4 years with language measures at 22 and 29 months

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It has been shown that language mastery at school entry is a major determinant of academic achievement, a finding that enhances the interest for early screening and intervention. The aim of the current paper is to test whether language outcome and school readiness at age 4 can be predicted with earlier measures of language development within a sample of 56 French-speaking monolingual children. At age 22 months (Wave 1), French-speaking toddlers' were tested with a parental report of expressive vocabulary (MCDI;WS, Fenson et al., 1993), a direct measure of lexical comprehension (Computerized Comprehension Task, CCT; Friend & Keplinger, 2003), and a novel word learning task (Woodward et al., 1994). At age 29 months (W2), expressive vocabulary was assessed again using the MCDI;WS, a pseudoword repetition task, two standardized tests tapping lexical and grammatical comprehension in French (Assessment of Oral Language, Khomsi, 2001), and a language sample recorded in a free play situation from which the MLU and the number of different words were extracted. Finally, at age 48 months (W3), they were assessed with a sentence repetition task, a pseudoword repetition task, a vocabulary task (French adapta-

tion of the Peabody Picture Word test, Dunn et al., 1993), and a school readiness task (Lollipop test, Chew, 1981). Performance scores at W1 and W2 were entered in two successive steps as predictors of the W3 outcome measures in regression analyses. Results show that the composite language score was significantly predicted by the CCT at W1, $F(1,51)=22.37$, $p<.001$, $R^2\Delta = .31$, and by the number of words reported to be produced at W2 (MCDI), $F\Delta(1,50)=14.26$, $p=.001$, $R^2\Delta = .15$. The CCT at W1 was the only significant contributor of school readiness, $F\Delta(1,55)=12.27$, $p<.001$, $R^2\Delta = .18$. These results indicate that early vocabulary development, and decontextualized lexical comprehension in particular, constitute reliable predictors of later language skills.

References

Dunn, L. M., & Thériault-Whalen, C. M. (1993). Échelle de vocabulaire en images Peabody. Adaptation du Peabody picture vocabulary test revised. Forme A. Toronto, Psychan.

Fenson, L., Dale, P. S., Reznick, J. S., Thal, D., Bates, E., Hartung, J. P., Pethick, S., & Reilly, J. S. (1993). *The MacArthur Communicative Development Inventories: User's guide and technical manual*. San Diego, CA: Singular Publishing Group.

Friend, M., & Keplinger, M. (2003). An infant-based assessment of early lexicon acquisition. *Behavior Research Methods, Instruments, & Computers*, 35(2), 302–309.

Khomsi, A. (2001). *ELO. Evaluation du langage oral*. Paris: ECPA.

Woodward, A. L., Narkman, E., & Fitzsimmons, C. M. (1994). Rapid word learning in 13- and 18-months olds. *Developmental Psychology*, 30, 553–566.

Chew, A. L. (1981). *The Lollipop Test, a Diagnostic Screening Test of School Readiness*. Humanics.

60 Acquisition of linguistic complexity between the ages of 6 and 13: a cross-linguistic perspective

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The period of late language acquisition can be characterized by the production of linguistically complex phenomena, such as the production of relative clauses (Diessel, 2004), or complex predications (Martinot et al, 2009), but also by the ability to act on the source language through complex reformulation procedures. We argue that children acquire their mother tongue by taking one invariant part from an utterance provided in the input language and modifying another part of the utterance (authors). This mode of adjustment becomes more complex with age, e. g. 10-year-old children reformulate two simple predications with one complex predication (Harris, 1988).

The main questions of this paper are:

1. Are complex reformulation procedures verified in the language of linguistically stimulated or non-stimulated children (S+ vs S-)?
2. Are these procedures comparable throughout different languages?

The data analysed in this paper are based on child story retelling. The story has been translated from French into Croatian and Italian while controlling the degree of sentence complexity. Children at the age of 6, 8, 10 and 13 (30 per age) were divided into two groups based on a questionnaire that evaluates their familiarity with written language and literacy in general.

Three reformulation procedures are analysed in children's utterances:

- (1) Analytical reformulation: the child decomposes the meaning of the source verb (from the age of 4);
- (2) Synthetic reformulation: the child synthesizes two or three simple predications from the source text into one complex predication (8 years);
- (3) Transformational reformulation: the child transforms the syntactic construction of the source predication (8 years).

Our results are gathered in three languages - Croatian, French and Italian - and show that synthetic and transformational reformulations are underrepresented in the language of S- children.

This result suggests that the quality of the language environment is an important factor in acquisition of linguistic complexity.

References

Diessel, H. (2004). *The acquisition of complex sentences*, Cambridge, Cambridge University Press.

Harris, S. Z. (1988). *Language and Information*. New York: Columbia University Press

Martinot, C., Kuvac Kraljevic, J., Bosnjak-Botica T. & Chur, L. *Prédication principale vs seconde à l'épreuve des faits d'acquisition en allemand, croate et français, langues maternelles*. In A. H. Ibrahim (Ed.). *Prédicats, prédications et structures prédictives* (pp.50-81). Paris : CRL.

61 Exceptionality and Strikings in the Acquisition of Generics

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Two distinctive characteristics of generics are interesting for both linguists and psychologists: (a) tolerance of exceptions (i.e. tigers have stripes is true albino tigers notwithstanding) and (b) striking generics that are valid even in the absence of strong statistical prevalence (i.e. sharks attack people is true even though very few sharks do so). Whether children know the critical properties (a) and (b) is unclear.

Building on Chambers et al. (2008), we investigated exceptionality and strikingness in the acquisition of generics. Exp 1: 32 English-speaking 4-5 year-olds (58-70 months) participated in a design where utterance type (generic/specific) and predicate property (neutral/striking – based on Warriner et al. 2013) were manipulated. Two instances of a novel made-up creature were introduced and a property was attributed using a generic or a specific (e.g. These are borps. Borps/These borps love to talk to their mothers [neutral]/ scare their mothers [striking]). A new instance of the same creature was then presented along with a question that measured extension of the property (e.g. 'Does this borp talk to its mother/scare its mother?'). Generics gave higher rates of extension than specifics in the neutral condition (78% vs. 64%), but not in the striking condition (61% vs. 62%) and neutral properties were more likely to be extended than striking ones (71.09% vs. 61.72%).

Exp 2: 64 English-speaking 4-5 year-olds (54-70 months). A third manipulation was added: exceptions (minimal/maximal). Task: Same as above, with an additional step that introduced exceptions (1 in the minimal, 3 in the maximal condition). We found no effects of utterance type or number of exceptions but replicated the effect of predicate (neutral were more likely to be extended than striking ones). Overall, we do not find evidence that 4-5 year-olds know that generics tolerate exceptions more than specifics or that generics can express striking

ing properties. Further research is under-way with adults and older children to evaluate which aspect of genericity is acquired and by when.

References

Chambers, C. G., & Graham, S. A., & Turner, J. N. (2008). When hearsay trumps evidence: How generics guide preschoolers' inferences about novel kinds. *Language and Cognitive Processes*, 23, 749-766.

Hollander, M.A., & Gelman, S. A., & Star, J. (2002). Children's Interpretation of Generic Noun Phrases. *Developmental Psychology* 36(6), 883-894.

Warriner, A.B., & Kuperman, V., & Brysbaert, M. (2013). Norms of valence, arousal, and dominance for 13,915 English lemmas. *Behavior Research Methods*, 45, 1191-1207.

62 Mean Length of Utterance for morphologically rich languages: the case of Russian

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For decades Mean Length of Utterance (MLU) has been used for estimating the level of linguistic competence in young children [1]. Despite some limitations of this method [2], overall MLU appears to be a reliable tool for languages with simpler morphology, including English [3]. However, little is known about how MLU should be adjusted for morphologically rich languages like Russian. First, it is not clear whether MLU (in words, morphemes or syllables) could be used for reliably assessing early production skills in Russian-speaking children; and if so, how are these MLU-words/morphemes/syllables values correlated? Second, due to the richness of both derivational and inflectional morphology in Russian, it is not known whether for estimating children's MLU one should rely on formal criteria by calculating the total number of morphemes per utterance, or use semantic/functional approach, differentiating between derivational and grammatical markers. Finally, this papers establishes, which MLU values reliably indicate milestones in linguistic development of Russian-speaking children and how these values correlate with the MLU norms observed cross-linguistically? The study explores these phenomena based on cross-sectional data from 20 Russian-speaking children aged 2;6-5;6

years, using mixed effects models and correlation analysis. The detailed approach for using MLU measurements in Russian as well as limitations of this tool in fundamental and clinical research are discussed.

References

Brown, R. (1973). *A First Language: The Early Stages*. Cambridge, MA: Harvard University Press.

Klee, T., & Fitzgerald, M. D. (1985). The relation between grammatical development and mean length of utterance in morphemes. *Journal of Child Language*, 12(2), 251-269. DOI: 10.1017/S0305000900006437

Rice, M. L., Redmond, S. M., & Hoffman, L. (2006). Mean length of utterance in children with specific language impairment and in younger control children shows concurrent validity and stable and parallel growth trajectories. *Journal of Speech, Language, and Hearing Research*, 49, 793-808. DOI: 10.1044/1092-4388(2006/056)

63 Comprehension of suffixal Subject-Verb number agreement in French-learning toddlers

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Comprehension of Subject-Verb number agreement appears late (between 3;6 and 6 years) in all languages tested (English, Spanish, German) except French, where comprehension of prefixal, liaison-based agreement (e.g., [il_ariv]/[iz_ariv] 'he/they arrive'; Legendre et al., 2010) was found at 2;6. Cue reliability strength and processing of the phonological liaison consonant were hypothesized as likely sources of facilitation (Legendre et al., 2014). Here, we examined a second SV agreement system in French, which is exclusively suffixal and morphophonologically irregular (e.g., [il ti]/[il tiz] 'he/they read'). We hypothesized that early comprehension of liaison-based agreement by 2;6 would foster cross-morpheme facilitation (e.g., Rispoli et al., 2012), leading to earlier comprehension of this suffixal agreement system than in languages relying exclusively on suffixal agreement.

A pointing task tested comprehension of suffixal agreement in 16 French-learning 3-year-olds. In 8 trials, children watched 8 pairs of videos, each re-

lated to an action corresponding to a different frequent French verb, performed by two boys (plural videos) versus one of two boys (singular). An experimenter then uttered a singular or plural sentence, asking the child to point to the matching video. Mean percentage of correct responses, calculated for verbs known by children according to parental report (7.88 on average), was 60.05%, significantly above chance level, $t(15) = 2.54$, $p < .03$. Moreover, there was no significant difference between the plural and singular trials, $t(15) < 1$.

These results reveal that comprehension of SV suffixal number agreement is in place early, by age 3 in French. While the next step will be to determine whether comprehension of suffixal and prefixal agreement emerges simultaneously in French (by 2;6 years of age), our findings already establish that the acquisition of suffixal agreement in French happens earlier than in any other language tested so far, supporting the cross-morpheme facilitation hypothesis.

References

Legendre, G., Barrière, I., Goyet, L., & Nazzi, T. (2010). Comprehension of infrequent subject-verb agreement forms: evidence from French-learning children. *Child Development*, 81(6), 1859-1875.

Legendre, G., Culbertson, J., Zaroukian, E., Hsin, L., Barrière, I., & Nazzi, T. (2014). Is children's comprehension of subject-verb agreement universally late? Comparative evidence from French, English, and Spanish. *Lingua*, 144, 21-39.

Rispoli, M., Hadley, P., & Holt, J. (2012). Sequence and system in the development of tense and agreement. *Journal of Speech, Language and Hearing Research*, 55, 1007-1021.

64 Language development and motor skills in Italian toddlers

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In recent years many studies have shown a close relationship between language and motor skills in both typical and atypical populations, consistent with the embodied view of cognition (Iverson & Braddock, 2011). However, the association between specific components of language and motor abilities in toddlers with language delay has received little attention, and contrasting results have been reported.

The present study aimed to assess the relationship between toddlers' language development and their motor skills, focusing on motor profile of children with language delay. Thirty Italian children aged 24 to 36 months ($M = 29.7$ months) from three nursery schools, participated in the study. They were individually tested with the Griffiths Mental Development Scales (Luiz et al., 2006), including scales on both gross and fine motor skills, and on language and cognitive abilities, and the Italian version of the MacArthur-Bates Communicative Development Inventory (Caselli et al., 2007).

Correlational analysis showed that fine motor skills were related to lexical production [$r(30) = .42$, $p < .05$]. Among the fine motor skills, visual-motor integration was more strongly related to language production [$r(30) = .48$; $p < .01$] than the other skills. However, different motor profiles emerged among children whose lexical production fell below the 10th percentile for age. Three children displayed a widespread delay in fine motor skills, showing lower scores in items involving object-oriented actions, visual-motor integration and complex sequences of fine motor actions; three children displayed a more specific delay in visual-motor integration, while a child did not show any delay in fine motor competence. These first results reflect the complexity of the relationship between language and motor development; furthermore, they could contribute to describe early indicators of developmental risk in a larger sample of children.

References

Caselli, M. C., Pasqualetti, P. & Stefanini, S. (2007). *Parole e frasi nel "Primo Vocabolario del Bambino"*. Nuovi dati normative fra 18 e 36 mesi e Forma breve del questionario. Milano: Franco Angeli.

Iverson, J. M. & Braddock, B. A. (2011). Gesture and motor skills in relation to language in children with language impairment. *Journal of Speech, Language, and Hearing Research* 54, 72-86.

Luiz, D., Barnard, A., Knoesen, N., Kotras, N., Horrocks, S., McAlinden, P., Challis, D., & O'Connell, R. (2006). *GMDS-ER 2-8 – Griffiths Mental Development Scales –Extended Revised: 2 to 8 years*. Firenze: Hogrefe.

65 The Predictors of Narrative Complexity in Turkish-speaking Children

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Narrative has two main functions: a) the referential function to express the events in sequenced clauses that reflect the temporal order of the events and b) the evaluative function to express the narrator's interpretation of and attitude towards the referential components (Labov & Waletzky, 1967). The first function is achieved through plot complexity reflecting the temporal and thematic organization of the narrative whereas the second function is achieved through evaluative complexity indicating the narrator's perspective toward the events. A third level of complexity, syntactic complexity, serves both of these functions, because complex syntactic structures are means to express the coherent, causal, temporal and logical order of the events. In the present study, the development of each level of complexity was examined in narratives told by 105 Turkish-speaking monolingual children in 4 age groups (4, 5, 7-8, and 10-11 years) and 15 adults looking at the wordless picture book "Frog, where are you?". The relationship between the levels of complexity and a) ToM measured with first- and second-order ToM tasks, b) executive function measured with the Emotional Stroop Task, and c) general syntactic competence measured with the comprehension of complement clauses was also analyzed. Considering the interdependencies between the three levels of complexity, a combined narrative complexity score was created through discriminant analysis. A multiple regression analysis demonstrated age and general syntactic competence, but not ToM and executive function, as significant predictors of the combined complexity score. This indicates a bi-directional relation between narrative and syntactic competence: Increasing syntactic competence over age affords more complex narrations and at the same time more complex narrations require more syntactic competence. These findings are further discussed considering the cognitive and linguistic nature of narration.

References

Labov, W., & Waletzky, J. (1967). Narrative analysis: oral versions of personal experience. In J. Helm (Ed.), *Essays on the verbal and the visual arts* (pp.12-44). Seattle, London: U. Washington Press.

66 Mothers' use of spatial language and spatial gestures

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Variations in parental speech influence children's later language skills. Recent studies also suggest a close link between parents' use of spatial language, spatial gestures, and children's spatial language development¹ and their subsequent spatial thinking². In this study, we ask whether (1) parents modify their spatial speech and gestures as a function of their children's age, and (2) children's early understanding of spatial language influence later parental input in speech and gesture.

Thirty-five toddlers played with their parents in a puzzle-solving setting. Children were divided into two age groups: 16- to 18-month-olds ($n=17$, $M=16.88$, $SD=.69$) and 19- to 21-month-olds ($n=18$, $M=19.67$, $SD=.68$). For spatial speech, we coded adjectives referring to shape (e.g., circle), locations of objects (e.g., near), orientation, transformation of objects (e.g., turn), deictics (e.g., there), and motion/spatial verbs. Gestures were coded as referring to one of these categories in the form of pointing, iconic or holding puzzle pieces. Parents evaluated their children's vocabulary knowledge 4-5 months prior to these play sessions using the Turkish Communicative Development Inventory (CDI).

Parents of older children produced more spatial words and in different types ($M_{total\ words}=33.83$, $M_{total\ types}=12.28$) than parents of younger children ($M_{total\ words}=19.18$, $M_{total\ types}=8.71$), $ps<.05$. There was no difference between age groups in terms of the total number of gestures ($M_{younger}=25.29$ and $M_{older}=21.16$) or spatial gestures ($M_{younger}=6.83$ and $M_{older}=7.72$). Children's early spatial vocabulary comprehension (but not total vocabulary) significantly correlated with parents' later use of total spatial words ($r=.48$, $p=.009$), different spatial word types ($r=.42$, $p=.015$), and spatial gestures ($r=.47$, $p=.006$).

Taken together, children's early understanding of spatial words relates to parents' use of spatial language and gestures. Parents adjust their spatial language based on children's age; yet, their spatial gestures remain constant across ages. Results are discussed regarding individual differences and parental input on learning spatial words.

References

Cartmill, E., Pruden, S. M., Levine, S. C., Goldin-Meadow, S., & Center, S. I. L. (2010). The role of parent gesture in children's spatial language development. In K. Franich, K. M. Iserman & L.L. Kei (eds.), *Proceedings of the 34th Annual Boston University Conference on Language Development*, (pp. 70-77). Somerville, MA: Cascadilla Press

Pruden, S. M., Levine, S. C., & Huttenlocher, J. (2011). Children's spatial thinking: does talk about the spatial world matter? *Developmental Science*, 14(6), 1417-1430.

67 Establishing Concurrent Validity for a New Speech and Language Test in Arabic Language

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Background: Arabic is radically different from English. Arabic inflectional and derivational morphology represents concatenative and rhyme and pattern root mapping systems. Clinically, one cannot translate standardized English language assessments. To date, there is no standardized test developed to assess language impairment for Arabic speaking children. Language sampling and linguistic analyses are often recommended when there is no established instrument, but the process is time consuming, subjective and requires expertise. Nevertheless, results from structured and benchmarked language sampling techniques are useful for examining convergent validity of a new instrument, especially when there are no other suitable measures (Pearson, Jackson & Wu, 2014; Bedore, Peña, Gillam, & Ho, 2010). Methods: a new Arabic language tool consisting of 6 subtests ranging across articulation, morphology, sentence repetition to syntax comprehension was designed as an application on iPad with a large variety of test items (97) suitable for discrimination throughout a broad age range. 362 typically developing children, equal numbers of boys and girls aged 3;0 to 7;11, participated in the study. Each child was tested by two trained examiners, and administering, scoring and coding reliability was checked by two expert researchers in Arabic linguistics, speech language pathology and test development. A benchmarked structured language sampling tool was designed to examine concurrent validity in a subsample (36) of the children, examining vocabulary and structural diversity, morphology, and narrative skills. Results: Data for the test was analyzed by Rasch analyses for item reliability. Items with low outfit were excluded (6); the remaining items had very high internal reliability (.99). The proportion correct correlated highly ($r=.75$; $p<.002$) with the coded results from the language sampling methods. Conclusion: The Arabic test showed both high internal reliability and a high concurrent validity which renders it a promising tool to evaluate Arabic speaking children.

References

Pearson, B. Z., Jackson, J. E., & Wu, H. (2014). Seeking a valid gold standard for an innovative, dialect-neutral language test. *Journal of Speech, Language, and Hearing Research*, 57, 495–508.

Bedore, L. M., Pena, E. D., Gillam, R. B., & Ho, T. H. (2010). Language sample measures and language ability in Spanish-English bilingual kindergarteners. *Journal of communication disorders*, 43(6), 498–510.

68 The role of parenting and Child Directed Speech in child's language development.

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Parenting variables on the one hand, and special properties of Child Directed Speech (CDS) on the other, have been related to child's linguistic development (Lieven, 1994; Roseberry, Hish-Pasek & Golinkoff, 2014).

Our aims are to explore the correlations between parenting and CDS, considered as two measures of the quality of parent-child interactions; and to analyze the relationship between both measures and child's linguistic development.

The participants were 20 families with a normally developing child, recruited from nurseries and convenience: 4 children aged 15-18 months; 9 aged 19-29 months and 6 aged 31-40 months. Mothers and fathers engaged, separately, in a 10-minute free play session at home, and auto-recorded their interactions. Two independent recorders scored the videotapes according to the PICCOLO scale (Roggman et al., 2013), which assesses mother/father-child interactions across four domains: affection, responsiveness, encouragement and teaching. We analyzed the parents' talk according to some CDS categories: imitation, repetition, expansion, extension, explanation, fiction, decontextualization, questions and labelling. Children's linguistic development was assessed with the BSID-III language scales. Additionally, the CDI was applied to children between 15 and 29 months, and the PPVT-III to children beyond 30 months.

Positive correlations were found between PICCOLO and CDS, both for mothers and fathers, being the number of positive significant correlations higher in the case of fathers. PICCOLO's scores and frequencies of CDS's categories, both for fathers and mothers, have been positively related to children's language development.

The results are discussed attending to the specific relations between parenting, CDS and linguistic de-

velopment in the different age periods, and to the differences found between mothers and fathers.

Specific characteristics of parents-child interaction are relevant for the child's linguistic development, whether we measure the general properties of interaction (PICCOLO) or the characteristics of parental speech (CDS). The role of fathers and mothers should be deeply explored.

References

Lieven, E. V. M. (1994). Crosslinguistic and cross-cultural aspects of language addressed to children. In C. Gallaway, & B. J. Richards (Eds.), *Input and interaction in language acquisition* (pp. 56-73). Cambridge: Cambridge University Press.

Roggman, L. A., Cook, G. A., Innocenti, M. S., Jump Norman, V., Christiansen, K., & Anderson, S. (2013). *Parenting Interactions with Children. Checklist of observations linked to outcomes*. Baltimore, Maryland: Paul H. Brookes Publishing Co.

Roseberry, S., Hirsh-Pasek, K., & Golinkoff, R. M. (2014). Skype me! Socially contingent interactions help toddlers learn language. *Child Development*, 85(3), 956-970.

69 Cancelled

70 Audiovisual speech perception, parental input, and vocabulary in the first year of life

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By 8 months, infants attend longer overall to a talker's mouth¹. Is this pattern of preference the result of maturation process or linguistic experience? Linguistic exposure plays a role as attention to the mouth region is more pronounced in bilinguals² and when processing nonnative language^{1,2}. However little is known about the role of social interactions in this process. Here, we directly explore how individual differences in parental speech input influence visual scanning, which could in turn be related to later linguistic achievement.

Twenty three monolingual French learning infants were tested longitudinally at 4, 8 and 12 months of age (data collection still underway). To

measure speech input, we collected home recordings of speech input at each age using the LENA system (previously validated in French), calculating the average number of adult words heard per hour. For the audiovisual task, two 45's videos in which a bilingual female speaker recited a monologue in French or in English were presented to each infant (presentation order was counterbalanced). We monitored gaze at two areas of interest (AOIs for the eyes and mouth) with a T60 Tobii eye tracker and calculated the proportion of total looking times (PTLT) for each AOI (as a function of time spent looking at the entire face). We also collected parental reports of infants' vocabulary at 12 months of age.

First, an ANOVA was conducted on PTLTs including age (4/8/12), language (native/nonnative) and AOI (eyes/mouth) as within subjects factors, and presentation order (native first/second) as a between subjects factor. Results revealed two main effects of Region ($p < .001$) and Order ($p = .007$) as infants looked longer to the eyes overall, and longer overall when their native language was presented first. There were also Age \times AOI ($p < .001$) and Region \times Order ($p = .015$) interactions, indicating that infants looked longer at the mouth as they got older, and when being presented with the non-native language first.

Second, correlational analyses revealed a link between parental input at 4/8 months and looking longer to the mouth at 8 months for the native ($r = .45$ $p = .04$) but not the nonnative language ($r = .002$, $p = .91$). Looking longer at the mouth when processing an unfamiliar language at 8 months was related with higher receptive ($r = .46$, $p = .009$) and productive ($r = .43$ $p = .07$) vocabulary scores at the age of 12 months.

Our results first confirm a developmental shift away from the eyes from 4 to 12 months, replicating Lewkowicz and Hansen-Tift (2012), although our sample showed less overall looking to the mouth (possibly due to more natural head movements in our stimuli). Our principal result indicates that more mouth looking is associated with increased speech input at 8 months of age, which suggests that language input affects visual scanning, which in turn, may be related to language proficiency at the end of the first year. This will be further evaluated by refining measures of language input, completing the group to 50 infants, and retesting our sample of infants at 18 months.

References

Lewkowicz, D. J., & Hansen-Tift, A. M. (2012). Infants deploy selective attention to the mouth of a talking face when learning speech. *Proceedings of the National Academy of Sciences of the United States of America*, 109(5), 1431-6.

2Pons, F., Bosch, L., & Lewkowicz, D. J. (2015). Bilingualism Modulates Infants' Selective Attention to the Mouth of a Talking Face. *Psychological Science*.

71 Re-visiting 5-year-olds' use of source accuracy in their evidential reasoning

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While evidential morphemes appear in children's production around 2-3 years, it has been reported that children's ability to judge information certainty using evidential morphemes does not develop until 6 years [1]. Choi et al. (2014), however, demonstrated that 5-year-olds can properly choose direct observation over hearsay as a more certain information source, only when the source of hearsay was unreliable, provided as an informant who labels objects inaccurately. But these results could have been due to the pairing of accurate informant/direct observation and inaccurate informant/hearsay, instead of displaying the children's actual evidential reasoning abilities. The present study re-examined 5-year-olds' use of source accuracy in their evidential reasoning by using a different method that avoids this type of source accuracy/evidential morpheme pairings.

Thirty-four Korean-learning 5-year-olds asked to help find various stolen objects by choosing a testimony offered by two animals. These animals first had interaction with a well-known liar, Pinocchio. One animal simply danced with Pinocchio and then looked into two boxes in front of them, while Pinocchio whispered to the other animal into the ear and this animal never looked inside the boxes. For Test trials, after these interactions, two animals state about the object's location; one using direct-observation marker (-e) and the other, hearsay marker (-tay). For Control trials, the child was asked to choose the location without the animals' statements. Half of the participants performed Test before Control trials. The results diverged by the child's sex: boys were at chance in control trials but they reasoned correctly during test trials, indicating linguistic markers helped them reason more properly. However, girls were above chance in both conditions, suggesting they could reason about more certain information source based on source monitoring alone. We will discuss these findings in relation to gender differences reported in mental state understanding [3].

References

Aksu Koç, A., Ögel Balaban, H., & Alp, I. E.

(2009). Evidentials and source knowledge in Turkish. *New directions for child and adolescent development*, 2009(125), 13-28.

Choi, Y., Bang, J., Jung, E., & Ju, N. (2014). Five-year-olds consider the source accuracy in their evidential reasoning. Poster presented at Boston University Conference on Language Development, Boston, USA, November, 2014.

Charman, T., Ruffman, T., & Clements, W. (2002). Is there a gender difference in false belief development?. *Social Development*, 11(1), 1-10.

72 Prior experience with actions that were highlighted by iconic gestures facilitates verb learning in three-year-olds

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When children hear a label for an action for the very first time, they often have seen this action before. In verb learning experiments that use multiple exemplars, however, all exemplars are labeled. Thus, it is unclear whether prior exposure to a referent action can serve as a "retrospective exemplar" and help children to learn a label for this action. This study examines if retrospective exemplars facilitate subsequent verb learning and if seeing iconic gestures with these retrospective exemplars influences the process.

Children struggle to learn verbs with multiple exemplars in which the actor changes, unless their attention is focused on actions (Maguire et al., 2008). Iconic gestures (e.g., wiggling fingers for "walking") can direct children's attention to actions and facilitate verb learning (Goodrich & Hudson Kam, 2009). We hypothesized that children benefit from retrospective exemplars in subsequent verb learning, but only if iconic gestures accompanying the retrospective exemplars focus their attention on the referent actions.

In the first phase, we showed 102 children (mean age: 41.60 months) videos of actors performing novel actions, accompanied by either iconic gestures representing those actions, or interactive gestures (e.g., showing surprise). Note that no gesture was presented after the first phase. In the second phase, we introduced verbs for either the same actions as in the first phase (retrospective exemplar condition), or a different set of actions (irrelevant action condition). In the test phase, children were then required to generalize the newly learned verbs

to scenes in which the labeled actions were performed by new actors (cf. Imai et al., 2005).

Children successfully generalized the verbs at test only in the retrospective exemplar condition and when those exemplars were accompanied by iconic gestures. This study is the first to show that children's prior experience with unlabeled actions influences verb learning.

References

Goodrich, W., & Hudson Kam, C. L. (2009). Co-speech gesture as input in verb learning.

Developmental Science, 12(1), 81-87. doi: 10.1111/j.1467-7687.2008.00735.x

Imai, M., Haryu, E., & Okada, H. (2005). Mapping novel nouns and verbs onto dynamic

action events: are verb meanings easier to learn than noun meanings for Japanese children? *Child Development*, 76(2), 340-355. doi: 10.1111/j.1467-8624.2005.00849.a.x

Maguire, M., Hirsh-Pasek, K., Golinkoff, R., & Bran-done, A. (2008). Focusing on the

relation: Fewer exemplars facilitate children's initial verb learning and extension. *Developmental Science*, 11(4), 628-634. doi: 10.1111/j.1467-7687.2008.00707.x

73 A longitudinal analysis of Spanish grammatical skills in Spanish-English bilingual children with and without language impairment

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Research on bilingualism indicates that first language skills are affected in language minority contexts. Children with limited exposure to their first language may incompletely acquire or lose their grammatical skills (Anderson, 2012; Montrul, 2008). This may seem the case for US Spanish-speaking children when they start English-only education. Clitics, verbs, articles and language complexity (lexical diversity, subordinated clauses, sentence length) are vulnerable to process of incomplete acquisition or language lost (Montrul, 2008, Simon-Cerejido & Gutierrez-Clellen, 2007). Importantly, these same elements are problematic for children with language impairment (LI). Additionally, vocabulary, sentence length and complexity have been found to predict later linguistic outcome in both lexical and syntactic domains (Restrepo et al,

2010; Simon-Cerejido, Gutiérrez-Clellen & Sweet, 2013). Therefore, understanding developmental paths of these structures across ability groups during their first years of schooling is critical.

The present study investigated Spanish grammatical development from preschool through third grade in children with and without LI attending English-only education. We address the following questions:

Does children's first language growth in grammatical elements differ between those with TD and LI?

Are there differences in growth per grammatical category? Do preschool morphological skills and expressive vocabulary predict later grammatical performance?

We hypothesized that both groups would show a decline in grammatical accuracy, but this would be more evident in children with LI. Clitics should be the most problematic structure because of their inherent complexity. Morphological and vocabulary skills will predict later grammatical accuracy.

The morphological skills of a group of 286 children were tracked using a growth curve model analysis. A subsample of 15 children with typical language development (TD) and 15 with LI, matched for age, gender, SES and parental education were tracked in the following areas: language complexity, and percent of accuracy on verbs, clitics, and determiners on narrative samples. Repeated measures ANOVAs were used to track differences in developmental trends across the five-time points.

Results show that children did not face incomplete acquisition or language lost as both groups increased their first language skills. However, children with LI lagged behind TD and showed higher ungrammaticality index. Contrary to our hypothesis, determiners was the most problematic structure for children with LI. The best predictor of linguistic outcome at 3rd grade was morphological skills. External factors such as input (quantity/quality) or output may be better predictors.

References

Anderson, R. T., & Goldstein, B. A. (2012). First language loss in Spanish-speaking children. *Bilingual language development and disorders in Spanish-English speakers*, 2, 193-212.

Restrepo, M.A., Castilla, A.P. Schwanenflugel, P., Pritchett, S., Hamilton, C. & Arboleda, A. (2010) Sentence length, complexity and growth in Spanish-speaking children attending English-only and bilingual preschool programs. *Language, Speech and Hearing Services in Schools*, 3-13.

Simon-Cerejido, G., & Gutierrez-Clellen, V. (2007). Spontaneous language markers of Spanish language impairment. *Applied Psycholinguistics*, 28, 317-339.

Simon-Cerejido, G., Gutiérrez-Clellen, V. F., & Sweet, M. (2013). Predictors of growth or attrition of the first language in Latino children with specific language impairment. *Applied psycholinguistics*, 34(6), 1219-1243.

Montrul, S. A. (2008). *Incomplete acquisition in bilingualism: Re-examining the age factor* (Vol. 39). John Benjamins Publishing.

Montrul, S. (2016). *Heritage language acquisition*. Cambridge: Cambridge University Press.

74 Evaluating the effectiveness of a reading for pleasure intervention: A randomised control trial.

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There is a virtuous circle between reading and language development. Children whose parents read with them regularly in the early years tend to develop a larger vocabulary and vocabulary size on school entry is, then itself, a significant predictor of later reading attainment (Bus, van IJzendoorn, & Pellegrini 1995; Mol Bus, de Jong, & Smeets 2008). Thus, the more we can encourage parents to read with their preschool aged children, especially disadvantaged parents, the more likely these children are to be protected against reading delay/difficulties at school (Manz, Hughes, Barnabas, Bracaliello, & Ginsburg-Block, 2010).

The current study implemented a Randomised Control Trial (RCT) to evaluate the impact on the language of disadvantaged children of a shared reading for pleasure intervention: The Reader's Get into Reading programme. Forty-three parents of children (3- to 4-year olds) took part in an 8 week-long local Get into Reading programme and 42 further families, were recruited to an active reading control group and were asked to attend their local library group once a week. The effect of the intervention will be assessed by comparing (i) children's expressive and receptive vocabulary language gains, (ii) attendance, and (iii) parental questionnaire data on attitudes to reading and author/title knowledge.

Preliminary findings from the first cohort show that we recruited sixty one families from our target of sixty families. Expressive and receptive vocabulary language tests were administered with 97% of children pre-intervention and 95% of children post-intervention. We successfully collected pre-intervention questionnaire data from 85% of families and post-intervention data from 51% of families.

Fidelity rates showed that 63% of families attended the intervention each week, whereas only 0.05% of families attended the weekly library groups. In accordance with CONSORT guidelines, the results from the RCT will also be presented here after data collection is completed in January 2017.

References

Bus, A. G., van IJzendoorn, M. H., & Pellegrini, A. D. (1995). Joint book reading makes for success in learning to read: A meta-analysis on intergenerational transmission of literacy. *Review of Educational Research*, 65, 1-21.

Manz, P. H., Hughes, C., Barnabas, E., Bracaliello, C., & Ginsburg-Block, M. (2010). A descriptive review and meta-analysis of family-based emergent literacy interventions: To what extent is the research applicable to low-income, ethnic-minority or linguistically-diverse young children? *Early Childhood Research Quarterly*, 25, 409-431.

Mol, S. E., Bus, A. G., de Jong, M. T., & Smeets, D. J. H. (2008). Added value of dialogic parent-child book readings: A meta-analysis. *Early Education and Development*, 19, 7-26.

75 Object Realization in Cantonese-English Bilingual Children

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This study examined object realization in Hong Kong Cantonese-English bilingual children. Cantonese allows omitting object arguments in pronominal contexts, e.g., when the referring element has been explicitly mentioned in the prior discourse. English, however, requires overt pronominal objects in such contexts, despite possible omission of a non-referential object of optionally transitive verbs. Given this, we investigated bilingual children's object realization with different verbal predicate types when prompted by questions with or without specified objects.

An elicited production task modeling on Pirvulescu et al. (2014) revealed a high percentage of non-target null objects in the English of 68 Hong Kong Cantonese-English bilingual children (3;04-7;06). Crucially, 55%, 34%, 20%, 23%, and 11% objects were incorrectly omitted by 3-, 4-, 5-, 6- and 7-year-old bilingual children when the prompt question had a specified object (e.g., what did Peppa do with the flower?). These null object rates were higher than those in the English monolingual peers (below 14%)

in Pirvulescu et al. (2014). The omission rates in bilingual children were significantly lower when the object was not specified (e.g., what did Peppa do?) than when it was specified, with 23%, 17%, 7%, 3% and 0, respectively. Three-argument verbs produced by 5- and 6-year-olds had significantly more object omission than simple transitive verbs in specified contexts; and optionally transitive verbs occurred with a null object significantly more often than the other verbs in unspecified contexts in 3-year-olds. The bilingual children's Cantonese were also tested. No significant difference was found between bilingual children and their age-matched Cantonese monolingual peers (39% to 59% in specified contexts and 2% to 11% in unspecified contexts). Null objects most frequently occurred with three-argument verbs in specified contexts, as in English.

Our results converged with the findings of Yip and Matthews (2007) based on corpus data, supporting Hulk and Müller's (2000) hypothesis for cross-linguistic influence. The findings did not support Pirvulescu et al.'s (2014) hypothesis which predicts more object omission in the Cantonese of the bilinguals than their monolingual peers. Our findings also suggested that verb type plays a role in bilingual children's object omission.

References

Hulk, A. & Müller, N. (2000). Bilingual first language acquisition at the interface between syntax and pragmatics. *Bilingualism: Language and Cognition*, 3(3), 227-244.

Pirvulescu, M., Pérez-Leroux, A. T., Roberge, Y., Strik, N., & Thomas, D. (2014). Bilingual effects: Exploring object omission in pronominal languages. *Bilingualism: Language and Cognition*, 17(3), 495-510.

Yip, V., & Matthews, S. (2007). *The Bilingual Child: Early Development and Language Contact*. Cambridge: Cambridge University Press.

76 Selective mutism in bilingual children

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Purpose: Although bilingual children are thought to be at higher risk for selective mutism (SM) (Elizur & Perednik, 2003), little is known about the development of SM in this population. This study examines the effect of children's anxiety and language skills as well as parents' cultural adaptation on the development of SM.

Method: 30 mono- and bilingual children (18 mute and 12 control) between the ages of 3 and 5 years 8 months were assessed longitudinally over a 9-month period. Parent questionnaires were used

to evaluate children's anxiety and parents' cultural adaptation. Receptive language skills were assessed with a standardized test. Parents and preschool teachers reported on the children's speaking behavior every 3 months via questionnaires.

Results: Anxiety best predicted the development of mute behavior. No isolated effect of bilingualism was found. The effect of language skills was considerably higher in preschool settings in comparison with family and public situations. Results also indicated an association between parents' cultural adaptation and children's speaking behavior in preschool.

Conclusion: Level of anxiety might function as an early indicator of SM in bilingual children. There is some evidence for the importance of cultural adaptation and language in the development of SM. But there is still a need for intensive research to understand the development of SM in bilingual children and to improve the early identification of children with SM.

References

Elizur, Y., & Perednik, R. (2003). Prevalence and description of selective mutism in immigrant and native families: a controlled study. *Journal of the American Academy of Child & Adolescent Psychiatry*, 42(12), 1451-1459.

77 Improving the Identification of Bilingual Children with Language Disorders: An Examination of Reliable Spanish Grammatical Markers

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The goal of this study is to identify grammatical structures that are reliable identifiers of language impairments and less vulnerable to variation in bilingual children. We conducted a cross-sectional exploratory study to examine group differences in morphosyntactic structures among Spanish-speaking children with various levels of English language proficiency with and without SLI. One hundred and twenty-one children between the ages of 4;0 and 6;11 participated in this study. Children were assigned to four groups: MonTD=monolingual typically developing (n=23); MonSLI=monolingual children with SLI (n=25); Bilingual typically devel-

oping=BilTD (n=42); BilSLI= Bilingual children with SLI (n=31). Monolingual Spanish-speaking children were recruited in Mexico City, and bilingual children were recruited in Western New York and Houston. Exploratory analyses were conducted to test for group differences on the performance of various grammatical structures. MonTD had higher percentages of accuracy of all grammatical structures but verbs (MonTD =BilTD), and adjectives (MonTD=MonSLI) in comparison to all other groups. BilTD had higher percentages of accuracy than Bil-SLI in all grammatical structures. The only structure that differentiated MonSLI and BilTD was clitics. Stepwise discriminant analysis with all the grammatical structures that were found to differentiate children with and without SLI in the previous analysis. For monolingual children, object clitics were found to discriminate with 85% specificity and 95% sensitivity. For bilingual children, verbs, subjunctive mood and clitics discriminated with 79% specificity and 97% sensitivity. When bilingual children were not penalized for substitution errors, clitics, and determiners discriminated with 83% specificity and 88% sensitivity. The results of this study suggest that clitic pronouns are particularly affected in language impairment, and vulnerable in bilingual contexts. However, the magnitude of the impairment allows to differentiate BilTD and MonSLI. Verb agreement and the use of the subjunctive mood showed good discriminatory accuracy between bilingual children with and without language impairment. This is in alignment with accounts that support the existence of an Optional Infinitive Stage in Spanish SLI (Griensd, et al. 2013) In sum, the verbal domain (mood and agreement) and object clitics can be used to differentiate between impairment from bilingualism, but the morphology of the nominal domain (articles, adjectives and plurals) is not.

References

Castilla-Earls, A., Restrepo, M. A., Perez-Leroux, A.T., Gray, S., Holmes, P., Gail, D. & Chen, Z. (2015). Interactions between Bilingual Effects and Language Impairment: Exploring Grammatical Markers in Spanish-Speaking Bilingual Children. *Applied Psycholinguistics*. DOI: 10.1017/S0142716415000521

78 Effects of L2 on L1 Narrative skills in Preschool and School-aged Children in L1 dominant contexts

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This study compares the narrative skills in first language (L1-Turkish) of early second language (L2-English) learners to those of monolingual children. Research on bilingual children's narrative development has often been limited to examining performance in L2, in L2 dominant minority contexts where low-SES is another variable playing a key role. In contrast, the present study explores L1 narrative skills of children from high-SES populations, in an L1 dominant context. Our main research question is whether there is an effect of early L2 learning on L1 discourse skills.

One-hundred and twelve 5- (n=54, Mage=69 months) and 7-year-old (n=58, Mage=91 months) monolingual and bilingual children were recruited. Children were asked to narrate a wordless picture-book *Frog, Where are you?* (Mayer, 1969) in L1. Narratives were coded on four dimensions: (1) Frog-Story-Elements: the overall plotline, (2) Sequence: chaining of successive events, (3) Perspective-and-Affect: adequate reference to characters and mention of internal states, (4) Engagement: effort for listener engagement (Pearson, 2002). Five-year-old monolinguals performed better on Frog-Story-Elements (M=5.25, SD=2.79) and Sequence (M=6.29, SD=2.64) compared to bilinguals (M=2.92, SD=2.71 and M=4.46, SD=2.59, respectively, $p<.05$); no difference was found for Perspective-and-Affect and Engagement. Seven-year-old monolinguals performed better in Sequence (M=8.91, SD=1.89), Perspective-and-Affect (M=7.36, SD=1.45) and Engagement (M=5.84, SD=.91) compared to bilingual peers (M=6.28, SD=1.69, M=2.60, SD=1.62 and M=3.00, SD=2.04, respectively).

Results indicate that the development of L1 narrative skills of bilinguals proceed at a slower pace compared to monolinguals even after two years of elementary education in an L1 immersion contexts. However, bilinguals display the same order of narrative achievements as monolinguals; 7-year-old bilinguals perform similar to monolingual peers for overall plot structure but lag behind for perspective-and-affect and listener engagement, i.e., the evaluative component. Findings suggest that early L2 learning has effects on L1 narrative discourse skills even in an L1 dominant context.

References

Mayer, M. (1969). *Frog, where are you?*. New York: Dial Press.

Pearson B. Z. (2002). Narrative competence among monolingual and bilingual school children in Miami. In: Oller D.K, Eilers R.E, (Eds.) *Language and literacy in bilingual children*. pp.135-174. Clevedon, UK: Multilingual Matters.

79 Differential effects of internal and external factors in bilingual children's dual vocabulary development: a case of Singapore

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Both internal factors (e.g. nonverbal intelligence) and external factors (e.g. input quantity) are claimed to affect the rate of children's vocabulary development. However, it is still an open question whether these variables work similarly on bilingual children's dual language development. Sun et al. (2016) proposed that the significance of internal factors might be restricted by external factors if the latter are insufficient in quantity/quality. The current paper aims at examining the hypothesis with the following questions:

1. Which internal and external predictors could significantly impact bilingual preschooler's receptive vocabulary?
2. What is the contribution of child-internal versus child- external factors as two groups to predicting variation in children's vocabulary?

Although Singapore is a bilingual society, there is an inclination for English use at home in recent years, resulting in a discrepancy of input between English and mother tongue languages in many families. 805 Singapore children (4;1-5;8 years old) who are learning English and a mother tongue language (Mandarin, Malay or Tamil) were investigated. Internal and external factors were examined comprehensively with parental questionnaire and standardized tests. Backward regressions and stepwise regressions were used for question 1 and 2.

Results demonstrated that both internal and external variables could significantly predict receptive vocabulary, in line with literature. On a group level, as Sun et al. (2016) predicted that, when input quantity and quality are not sufficient (i.e., mother tongue language learning), external factors could explain more variance than internal factors. For English receptive vocabulary, the situation is the opposite: internal factors explained more variance. This implies a threshold effect of external factors: while internal factors make an important contribution to child bilingual vocabulary development, external factors can substantially influence the outcome on top of that, even explain more of the outcomes than the internal factors.

References

Sun, H., Steinkrauss, R., Tendeiro, J., & de Bot, K. (2016). Individual differences in very young children's English acquisition in China: Internal and external factors. *Bilingualism: Language and Cognition*, 19(3), 550-566. doi:10.1017/S1366728915000243.

80 Translation Equivalents and Lexical Processing in Bilingual Toddlers

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It is well established in the literature that bilinguals demonstrate non-selective activation of lexical representations in both languages regardless of language context (Kroll, Bobb & Wodniecka, 2006). Although dual-language activation can lead to interference, it has also been shown to generate facilitation effects with regard to lexical retrieval (Gollan et al., 2005). However, the majority of research on lexical retrieval has been conducted with adults, leaving this area relatively unexplored in very young bilinguals. The present study aimed to examine the relation between translation equivalents (TE; e.g., dog in English and chien in French) and speed of processing in the dominant (D) and non-dominant (ND) languages of a sample of 22-month-old French-English bilinguals. A total of 36 children were administered the Computerized Comprehension Task (CCT), and parents completed the MacArthur Bates Communicative Development Inventory (MCDI) in both English and French. Correct trials on the CCT ($M = 52.56$, $SD = 9.98$) were identified and classified in one of two categories: words with a known TE on the MCDI and words without a known TE on the MCDI. Reaction times for correct trials were then averaged in each category and compared in each of the bilinguals' languages. Children were faster to respond to trials with a known TE on the MCDI compared to trials where no TE was reported. This effect was observed in both D and ND on correct trials, but was not observed when similar analyses were conducted on incorrect trials. These findings suggest that having a greater proportion of TEs in one's vocabulary facilitates lexical access in very young children through the development of increasingly complex semantic networks. This is the first study to report a TE facilitation effect in the dominant and non-dominant languages of bilinguals in the second year of life.

References

Gollan, T. H., Montoya, R. I., Fennema-Notestine, C., & Morris, S. K. (2005). Bilingualism

affects picture naming but not picture classification. *Memory & cognition*, 33, 1220-1234.

Kroll, J. F., Bobb, S. C., & Wodniecka, Z. (2006). Language selectivity is the exception, not the

rule: Arguments against a fixed locus of language selection in bilingual speech. *Bilingualism: Language and Cognition*, 9, 119-135.

81 Acquiring Gender and Case in Russian: Russian-Dutch, Russian-Swedish and Russian-Azerbaijani bilingual children compared with their monolingual peers with and without SLI and adult learners of Russian as a foreign language

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The study presents a cross-linguistic comparison of simultaneous and early successive bilingual children and their monolingual Russian peers with and without language impairment (SLI). The emphasis will be made on the acquisition of gender and case in the oral speech of adults and children.

Data: audio recordings of speech typically developing 30 Russian–Dutch, 18 Russian–Swedish and 15 Russian–Azerbaijan bilingual children (age 4-6), typically developing Russian monolingual children (age 2-6, n=50), Russian monolingual children diagnosed with SLI (age 4-6, n=50) and adults studying Russian as a foreign language (adult students, n=60). The recordings were transcribed according to the CHILDES conventions (McWhinney 2000) and the acquisition of gender and case was analyzed.

The results indicate partial similarity between typically developing bilingual children, monolingual children with SLI and adults acquiring Russian as a second language. The ungrammatical forms found in the speech of bilinguals were of three kinds: (1) those that were also present in monolingual Russian children, (2) those found in speakers acquiring Russian as foreign language and (3) those found in the material of Russian SLI children.

Several structural modifications and replacements were found in the children's narratives in Russian that can be classified as bilingual innovations (Ceytlin 2009) since they arise as a natural outcome of children's contact with the two languages. But they cannot be explained by transfer alone since the children made mistakes even when the two lan-

guages were structured in the same way (Rakhilina et al. 2014). Rather, the bilingual environment as such seems to be the cause of the decreased structural complexity in one language – but not in both.

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References

Ceytlin S. N. (2009). *Ocherki po slovoobrazovaniju i formoobrazovaniju v detskoj rechi* [Essays on word formation and form building in children's speech] Moscow: Znack.

Rakhilina E. V., Vyrenkova A. S. (2014). *Language Interference in Heritage Russian: Constructional Violations* // NRU HSE. Series WP BRP "Linguistics" 11.

McWhinney B. (2000). *The CHILDES project: tools for analyzing talk*. – 3rd edition. Mahwah-New Jersey: Lawrence Erlbaum Associates.

82 Icelandic as L1 and L2 and English as foreign language skills of adolescents in Iceland: How well does self-rated performance match test scores?

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Immigration is a recent phenomenon in Iceland, as is large scale learning of Icelandic as L2. A previous study reported that over half of their school-age L2 learners of Icelandic scored two or more standard deviations (SDs) below native peers in Icelandic (Elin Thordardottir & Anna Gudrun Juliusdottir, 2013). Further, adolescent L2 speakers rated their own performance in English higher than their Icelandic performance in spite of being schooled in Icelandic (Elin Thordardottir, 2013). The present study followed up on this finding by conducting direct testing and self-rating of the Icelandic and English performance of native and L2 speakers of Icelandic.

Participants were enrolled in grades 8 to 10 in Reykjavík schools, and included native speakers of Icelandic (n=17, mean age 169 months) and L2 speakers of Icelandic (n=18, mean age 172 months). The two groups did not differ in age (p=.279), but differed marginally in maternal education (p=.052).

Icelandic and English Performance: The two groups differed significantly in their raw scores on a formal test of Icelandic (Milli mála: p<.001), but not on formal tests of English (PPVT: p=.833; EVT: p=.272). Standard scores reflect performance relative to a

normative group. Native Icelandic speakers obtained significantly higher standard scores in Icelandic than English ($p=.000$); L2 speakers obtained comparable standard scores in Icelandic and English ($p=.640$).

Self-rated Performance: The native and L2 speakers of Icelandic did not differ in their self-rating of their English proficiency. They also did not differ in their self-rating of their oral Icelandic skills; however, L2 speakers gave lower ratings than native peers of their Icelandic reading and writing ability. Native speakers rated their Icelandic skills higher than their English skills ($p=.000$) whereas L2 speakers rated their skills in both languages the same. For L2 speakers, English and Icelandic ratings were correlated with both Icelandic and English scores, more highly so for English; for native speakers, performance ratings in Icelandic predicted performance in English only. The results reveal that L2 speakers of Icelandic have similar English (as a foreign language) skills as native Icelandic speakers, but far lower Icelandic skills. L2 speakers appear to be more accurately aware of their English skills, and native peers more aware of their Icelandic skills.

References

Thordardottir, E. (2013). Próf til að meta íslenskukunnáttu barna sem tala hana sem annað mál [A test to measure the Icelandic proficiency of children who speak it as a second language]. Conference organized by the Reykjavik School Board, March.

Thordardottir, E. & Juliusdottir, A. G. (2013). Icelandic as a second language: A longitudinal study of language knowledge and processing by school-age children. *International Journal of Bilingual Education and Bilingualism* 16, 411-435.

83 Discourse markers and syntactic connectives in L2 Spanish: a developmental path across discourse genres and modalities of production

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Discourse markers (DMs) and syntactic connectives (SCs) serve the crucial function of connecting discourse at the inter- and the intraclausal level and are therefore fundamental for achieving text organization and coherence. Only a handful of studies have examined their behavior from a develop-

mental viewpoint, particularly in second language (L2) acquisition. In this study we examined the development of DMs and SCs use by L2 speakers of Spanish, factoring in the role of discourse genre, modality of production (written vs. spoken), and L2 proficiency level.

Sixty learners of Spanish (L1= Arabic, Korean, Chinese) divided into three age groups (9-10 years; 12-13 years, and university students) participated in the study. Participants produced four texts after watching a target video on conflicts at school: a spoken and written narrative, and a spoken and written expository text (Berman & Verhoeven, 2002). DMs and SCs were tallied and classified into different types.

Results showed that DMs were more frequent in spoken narratives, and that their overall frequency increased with age, though only in written texts. Interestingly, learners' L2 proficiency level had no attestable effect on the number or type of DMs across genres and modalities. In contrast, SCs varied as a function of both L2 level and age, and were more frequent in spoken texts.

We conclude that some DMs and SCs are useful genre indicators in L2 discourse, as they are distinctly distributed in discourse genres. The differential impact of L2 proficiency on DMs and SCs suggests that only specific aspects of discourse competence are transferable: while the developmental pattern of DMs use in L2 mirrors, to a great extent, previous findings on L1 production, this was not the case for SCs, which depend on L2 proficiency. Research on L2 acquisition must, then, consider diverse communicative contexts when assessing the ability to connect discourse.

References

Berman, R. A., & Verhoeven, L. (2002). Cross-linguistic perspectives on the development of text-production abilities: Speech and writing. *Written Language and Literacy*, 5 (1), 1-135. doi:10.1075/wll.5.1.

84 Identifying bilingual children at risk for SLI and children with limited L2-input

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It is well-known that identifying bilingual children at risk is difficult because the linguistic behavior of typically developing bilingual children resembles that of monolingual children with Specific Language Impairment (SLI). Various tasks have been shown to identify bilingual children at risk for SLI, for instance tasks of non-word repetition (NWRT; Thordardottir & Brandeker, 2013) or sentence repetition (SRT; Meir et al. 2016). Children with limited L2-input should perform within the norm of the NWRT, but perform poorly in the SRT. Our research question is: Which measure is most reliable to identify children at risk for SLI and children with limited L2-input?

Our longitudinal study comprises three measuring points (every six months, starting at age 4;0). Besides language tests (comprehension and production) and non-verbal measures of executive functions (Roid et al., 2013), the children were given two language-specific repetition tasks (non-words and sentences), two language-specific non-word tasks involving pattern completion via syllable addition, an n-back test and a pairwise comparison of melodies. All tasks were developed by our team.

We will report on the data from 50 children from the third measuring point. The NWRT revealed a group of three children as at risk, at least 1.5 SD below the project norm. Within the norm in the NWRT were 9 children with good language scores in Russian and at least 1 SD below the project norm in German. The two control groups were within the norm in both NWRTs and in the norm in all language tests (n=29) or only in the German but not in the Russian language tests (n=9).

The three children at risk and six of the nine input children were 1-2 SD below the norm in the n-back test. The pairwise comparison of melodies did not differentiate clearly between the groups. The tasks of pattern completion showed similar results to the NWRT. The results of the sentence repetition tasks confirm the grouping of the children according to the NWRT. Thus far, the repetition tasks are the best in differentiating children at risk from children with limited L2-input and the control groups.

References

- Meir, N., Walters, J. & Armon-Lotem, S. (2016). Disentangling SLI and bilingualism using sentence repetition tasks: the impact of L1 and L2 properties. *International Journal of Bilingualism*, 20, 421-452.
- Roid, G., Miller, L., Pomplun, M., & Koch, C. (2013). *Leiter-3. Leiter International Performance Scale-Third Edition*. Wood Dale: Stoelting Company.
- Thordardottir, E., & Brandeker, M. (2013). The effect of bilingual exposure versus language impairment on nonword repetition and sentence imitation scores. *Journal of Communication Disorders*, 46, 1-16.

85 Early lexical development of Turkish-Flemish bilingual children in a language minority setting

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In the present research, we used the Turkish and the Dutch versions of CDI to examine relationships between lexical and grammatical development in children acquiring Turkish and Dutch in a bilingual context. As a result of the substantial growth of cross-linguistic studies in line with the availability of CDI in more than 60 languages with monolingual populations, researchers, next, considered bilingual populations to discover the bilingual language development milestones. Studies using CDI in different languages with monolingual children (Bornstein et al, 2004; Kern, 2007) pointed out a language trajectory from reference words, to predicates and then to grammatical words. It was also highlighted that these developmental trends in monolingual children were tied to the changes in the vocabulary size. Then, bilingual populations were focused to understand the interaction between the grammatical abilities and lexical development because children growing up in a bilingual context showed different types of bilingualism, which was assumed to reflect language-general and language specific processes in acquisition (Conboy & Thal, 2006).

In this specific research, we examined the proportions of nouns, predicates (verbs and adjectives), social words (games, routines, proper names) and function words through CDI toddler form with 40 Turkish-Dutch bilingual children. We also considered the bilingual family patterns as Turkish-dominant, balanced and Dutch-dominant. We concentrated on these two languages because of the striking typological differences between Turkish and Dutch. The results conform to the findings from other bilingual populations, indicating the three waves of lexical organization from common nouns to predicates, then, to closed class words in both Dutch and Turkish lexicon of the children in the study. Apart from the similarities, we also observed differences related to inter-individual variability. In line with the related literature, we suggest that this pattern can be attributed to the type of children's bilingual language exposure at home context.

References

- Aksu-Koç, A., Küntay, A., Acarlar, F., Maviş, İ., Sofu, H., Topbaş, S., & Turan, F. (2009). The assessment and evaluation of early lexical and grammatical development in Turkish: The

Turkish Communicative Development Inventories, TIGE-I and TIGE-II. Final report of Project Proje No: 107K058, submitted to Turkish Scientific and Technological Research Foundation.

Kern, S. (2007). Lexicon development in French speaking infants, *First Language*, 27 (3), 227-250.

Zink, I, & Lejaegere, M. (2002). N-CDIs: Lijsten voor Communicatieve Ontwikkeling. Aanpassing en her-normering van de MacArthur CDIs van Fenson et al.

Acco, Leuven (Belgium)/Leusden (Netherlands). (A CDI user's manual with

normative and validity data).

86 L2 Oral Narrative Development in Ethnic Minority Children of Hong Kong

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This is a report on the late development of L2 narrative skills in sub-group of ethnic minority children of Hong Kong who are commonly called South Asians (SA hereafter). While most SA children were born in Hong Kong, they acquired their heritage languages as their first language and have very limited exposure to Cantonese at home. They have a late start in their oral Cantonese skills, only when they were studying in mainstream schools in which Cantonese is the medium of education. The present study examined how L2 oral narrative skills developed in these SA children, with a focus on the contribution of their L2 vocabulary and grammar. Thirty SA children, 13 boys and 17 girls, were examined with a test battery compiled from a standardized test, Hong Kong Cantonese Oral Language Assessment Scale, which included a story-retelling task, an expressive vocabulary test and a receptive grammar test. Participants were tested in their own schools and in the two time points, with 10 to 12 months in between. The results showed that these SA children performed far below age expectations at the first time point but they made significant progress in one year's time, in particular in the comprehension of complex sentence structures. They performed better in co-indexing referential expressions in their narratives. Regression analyses also revealed that their receptive grammar at age nine significantly predicted their performance in story-retelling one year later. While grammar is found to be important, little progress were seen in their expressive vocabulary, especially in items that are strongly tied to certain local cultural practice. Neither could they name them in English nor in their heritage languages. These results pointed to a very different course of L2 development and their implications to their L2 written language development will be discussed.

References

T'sou, B., Lee, T., Tung, P., Chan, A., Man, Y., To, C. (2006). *Hong Kong Cantonese Oral Language Assessment Scale*. Hong Kong: City University of Hong Kong Press.

87 Cross-linguistic interference in copula verb omission in 2L1 Romanian in a Romanian-Hungarian context

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Copula verb omission (CVO) is attested in a significant number of languages but the extent to which children omit copula verbs is subject to cross-linguistic variation. When attested, the omission is sensitive to several factors among which the semantic properties of the predicate. The omission rate tends to be higher in stage-level (SL) than in individual-level (IL) predicates (Becker 2001, Czinglar et al. 2008). 2L1 CVO, however, has a different pattern which reflects cross-linguistic interference (Liceras et al. 2011). Extending the analysis to more languages could shed light on the nature of CVO and on the possible effects of cross-linguistic interference. This study investigates the acquisition of copula *be* in 2L1 Romanian in a Romanian-Hungarian context. Our data come from 2 longitudinal corpora of Romanian-Hungarian bilinguals (1;11 – 2;11) and 2 longitudinal corpora of monolingual Romanian (1;9 – 3;1). This context offers a perfect ground for the examination of the possible effects of cross-linguistic interference. In Romanian, copula use is obligatory in all copulative predicates. In Hungarian, the copula is only overt when it needs to carry bound morphosyntactic affixes: the past tense or the 1st and 2nd person agreement marker: the 3rd person present tense singular and plural copula (but not locative/existential *be*) is null. If CVO is affected by cross-linguistic interference, one predicts a higher rate of omission in 2L1 Romanian with present tense 3rd person copulative predicates (mostly IL in the corpus), but not with locative predicates (mostly SL). The prediction is borne out by the data. In L1 CVO is slightly higher with SL than with IL predicates (25% vs. 11%), while in 2L1 Romanian the omission rate is reversed (11% vs. 37%). The 1st / 2nd person copula is omitted in only one of the corpora and to a much lower extent (8%).

References

Becker, M. (2001). The syntactic structure of predicates: Clues from the omission of the copula in child English. *ZAS Papers in Linguistics* 22, 25-42.

Cztinglar, C., Katičić, A., Köhler, K., & Schaner-Wolles, C. (2008). Strategies in the L1 acquisition of predication: The copula construction in German and Croatian. In N. Gagarina & I. Gülzow (Eds.) *The Acquisition of Verbs and their Grammar. The Effect of Particular Languages*, 71-104. Dordrecht: Springer.

Liceras, J. M., Fuertes, R.F., & de la Fuente, A.A. (2011). Overt subjects and copula omission in the Spanish and the English grammar of English-Spanish bilinguals: On the locus and directionality of interlinguistic influence, *First Language*, 32(1-2), 88-115.

88 Describing the Early Home Language Environment of Dual Language Learners: An Examination of the Activity Settings of Spanish-Speaking Children in the US

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Background: It has been estimated that two-thirds of children internationally are exposed to more than one language. Oftentimes, children learn a minority language at home that differs from the majority language of their communities. Thus, the influence of the home context on dual language learning must be considered, particularly in the first three years of life when children spend substantial time with caregivers. Specifically, children's activity settings should be examined (Gallimore et al., 1993), which include cultural beliefs and values of caregivers, activity types, participants, goals, and corresponding language input. These characteristics comprise the sociocultural context in which language is learned. Therefore, the aim of this research was to describe the activity settings of young Spanish-speaking children in the United States.

Design: Thirty-Four Mexican immigrant families with children ages 15-28 months participated. Mothers described their children's language-learning experiences via semi-structured interviews that were qualitatively analyzed for the activity settings. The LENA digital language processor (LENA ProSystem, 2012) recorded ~16 hours of children's natural home language experiences to capture the quantity, quality, and proportion of Spanish-English provided. Integration of these data allowed for a robust description of these children's early dual language learning experiences.

Conclusion: Beliefs and values regarding language learning included the importance of explicit and implicit teaching as well as bilingualism. Children's most frequent activities were play, meals, and television; book reading and preacademics were infrequent. Activity participants primarily included mothers, although older siblings and other adults also assumed important roles in language teaching. The main goals of children's activities were to teach behavior and to facilitate language development. Regarding language input, children received a wide range of quantity and quality. Spanish was spoken most frequently, although English was also present in most homes. A case study will demonstrate the links between these activity settings and the LENA data.

References

Gallimore, R., Goldenberg, C. N., & Weisner, T. S. (1993). The social construction and subjective reality of activity settings: Implications for community psychology. *American Journal of Community Psychology*, 21(4), 537-560. doi: 10.1007/BF00942159.

LENA Pro System (2012). [Apparatus and software]. Boulder, CO: LENA Research Foundation.

89 Cross-linguistic influence in simultaneous bilingual acquisition of tense: the effects of Tamil and Chinese

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Previous studies have shown that simultaneous bilingual children show some influence of their other language in their acquisition of tense morphology in English (Paradis, 2011; Nicoladis, Song & Marantette, 2012). Using the Test of Early Grammatical Impairment (Rice

& Wexler, 2001), we investigated whether the presence of overt morphology in the L1 affected the production and judgement of tense morphology by 20 Tamil-English and Chinese-English bilingual children aged 6-8 years old, matched for dominance and proficiency. In this study, we compared the effects of two non-Indo-European languages, one a tense marking language with overt markers of tense and agreement (Tamil) and the other a non-tense marking language (Chinese). We looked at not just their production of the third person singular -s and past tense, but also their judgement of grammatical morphemes.

Although the Tamil group outperformed the Chinese group for all three tasks, the bilinguals as a

group performed at age-appropriate norms for the past tense and judgement probes, and were less accurate than same-age monolinguals for the third person singular –s probe. Like their monolingual counterparts, the bilinguals were more accurate with the regular than the irregular past tense, and made more overregularisation than commission errors with the irregular past tense. They also performed better for the judgement task than the production tasks. The results support the view that bilingual children follow the same patterns of acquisition for tense morphology as monolingual children, with small but consistent effects of transfer due to their knowledge of another language.

References

Nicoladis, E., Song, J., & Marentette, P. (2012). Do young bilinguals acquire past tense morphology like monolinguals, only later? Evidence from French–English and Chinese–English bilinguals. *Applied Psycholinguistics*, 33(3), 457–479.

Paradis, J. (2011). Individual differences in child English second language acquisition: Comparing child-internal and child-external factors. *LAB*, 1(3), 213–237.

Rice, M., & Wexler, K. (2001). Rice Wexler Test of Early Grammatical Impairment. Psychological Corporation.

90 The transient use of perfective already in Cantonese-English bilingual children: developmental asynchrony and typological incompatibility

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This study investigates the emergence of perfective aspect in Cantonese-English bilingual children through analyzing the corpus data of 9 bilingual children. As we observe, a range of developmental phenomena in Cantonese-English bilingual children are compatible with Heine and Kuteva's (2005) model of contact-induced grammaticalization, a particularly interesting case being the novel use of already alongside uninflected verbs to mark perfective aspect, as in (1):

(1) She wake already. 'She has (already) woken up.'
(Sophie 2;06)

The child usage differs from English in lacking the "contrary to expectation" reading normally associated with already (Soh 2009), illustrating semantic bleaching. We show that the adverbial already serves a function similar to that of the perfective marker Cantonese zo2 which appears as a suffix attached to the verb as in (2):

(2) *Keoi5 seng2-zo2*
3SG wake-PFV 'S/he has woken up.'

However, Cantonese constructions such as [V zo2... laa3] (3) may also serve as the models for the contact-induced grammaticalization of already, which may imply that the bilingual children do not use already as an exact equivalent of the Cantonese zo2 but also identify it with other particles such as laa3:

(3) [To father] *Lei5 sik6-zo2 laa3*
2SG eat-PFV SFP 'You've eaten (already).'

[To helper] He has eat
already now.
(Timmy 2;06)

Two factors may have led to the emergence of perfective already in the bilingual children – first, the inflectional morphemes involved in the target-like English perfect form are incompatible with the isolating typology of Cantonese; second, the bilingual children's development in the present perfect tense system shows at least a 6-month delay compared with their monolingual counterparts.

Adopting a uniformitarian, evolutionary approach to language transmission (Mufwene 2001), we discuss why the perfective already is also commonly observed in contact languages, and why it eventually fades out at later stages of bilingual development.

References

Heine, B., & Kuteva, T. (2005). *Language Contact and Grammatical Change*. Cambridge: Cambridge University Press.

Mufwene, S. S. (2001). *The Ecology of Language Evolution*. Cambridge: Cambridge University Press.

Soh, H. L. (2009). Speaker presupposition and Mandarin Chinese sentence-final -le: a unified analysis of the «change of state» and the «contrary to expectation» reading. *Natural Language and Linguist Theory*, 27, pp. 623–657.

91 Past tense and plural formation in Welsh-English bilingual children with and without SLI

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Tense is especially challenging for children with Specific Language Impairment

(SLI), both monolingual (Mo-SLI) and bilingual (Bi-SLI) (Leonard, 2014 for a crosslinguistic overview of Mo-SLI and Paradis, 2016 for Bi-SLI children). In comparison to the verbal domain, noun plural formation has received less attention. Most studies are on Mo-SLI children (Oetting & Rice, 1993), with very few studies on bilingual typically developing (Bi-TD) children (Thomas et al., 2014). In these studies, children with SLI are less productive and more affected by frequency (Marchman et al., 1999) than their TD peers.

The present study reports novel data from the first study on Welsh SLI. Eleven Welsh-English (WE) school-aged Bi-SLI (mean age:63 months) and 18 WE age-matched Bi-TD (mean age:66.5 months) children participated in past tense and plural formation tasks in Welsh. Welsh is a VSO language. Past tense can be formed periphrastically with a verb compound as in AUXFIN+S+(ASP)+VINFIN+(O), or with a less frequent synthetic form of the inflected lexical verb. Plurals in Welsh are formed via suffix addition, deletion, substitution, and suppletion. Past tense was elicited through an elicited production task and a sentence completion task. Plural formation was targeted in a sentence completion task.

In the elicited production task, the Bi-SLI children had lower accuracy than the Bi-TD children, who were at ceiling on the periphrastic tense by this age. Bi-SLI children were less likely to produce the synthetic past when prompted. In the plural formation task, both groups exhibited a protracted acquisition pattern (Thomas et al., 2014). However, the Bi-SLI children had lower accuracy than their Bi-TD peers, were less likely to overregularise, and when they did, they opted for high frequency plural suffixes. These results suggest that tense is problematic for Welsh-speaking Bi-SLI children. The implications of these findings for SLI theories are discussed.

92 Neurophysiological indices of visual context during sentence processing in children

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When children hear sentences, these sentences often refer to events in the visual world (e.g., Someone saying “That dog is playing” when a dog

is visible). This means that children’s processing of auditory sentences is frequently accompanied by concordant visual information, which may scaffold comprehension. Most electrophysiological studies exclusively focus on how the words within a sentence impact processing (e.g., “dog” primes the verb “play”), but neglect the influence of visual context. We undertook three experiments using event-related potential measures to examine how sentence processing is modulated by visual information, measuring neurophysiological indices of visual processing. In Experiment 1, we presented pictures for 300 ms and then matching sentences were played while pictures remained visible. Twelve school-aged children were tested, and showed two large occipital positivities to these pictures – one 100 ms after picture onset, and another about 300 ms later, right when the sentence began. We speculated that the second peak may indicate reactivation of visual processing in relation to sentence meaning. In Experiment 2, we presented pictures or a fixation symbol “+” for 1-s before the sentences were played and the pictures stayed on during the sentences. Eight children showed greater occipital positivity to sentences following pictures than following “+”, suggesting that it was not merely the onset of the sentences that led to the second large occipital positivities in Experiment 1. In Experiment 3, we presented related pictures for 1-s before or after sentences, and removed pictures from the screen while the sentences were played. During both conditions, children showed reactivation of visual processing while the sentence was played, even though no picture was on the screen. These findings indicate that visual context plays a significant role in neural responses during sentence processing, and needs to be further explored to fully understand sentence comprehension processes.

93 Two Days in the Life: Naturally Occurring Emotion Talk with Preschoolers

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Parents’ talk about emotions with their preschoolers is related to children’s socioemotional skills; critically, parents talk about emotions in different ways with their daughters and sons (Denham, Bassett, & Wyatt, 2007). Most of this research, however, is based on mothers’ emotion talk in structured tasks (e.g., when reading a picturebook with a negative theme, or when

asked to talk about a time the child was angry or sad). We sampled naturally occurring emotion talk over two weekend days nearly one year apart in 35 families of mothers, fathers, and their 4- to 5-year-old children using EAR technology (electronically activated recording; Mehl et al., 2001). From each day of talk, 150 30-second segments were randomly selected for transcription and analysed for presence and valence of emotion words using Linguistic Inquiry and Word Count software (LIWC; Pennebaker, Booth, & Francis, 2007). Negative emotion talk was extremely rare in naturally occurring speech (<1% of talk for children and parents), but increased over time. Mothers talked more overall than fathers and children, and specifically issued more positive (but not negative) emotion words. Children talked more about both positive and negative emotions over time. However, girls used more positive emotion words than boys on both days. Mothers' (but not fathers') positive and negative emotion talk was positively correlated with their daughters' positive and negative emotion talk, but neither mothers' nor fathers' emotion talk was positively correlated with sons' emotion talk. We discuss these findings in terms of the importance of talk about positive and negative emotions in everyday life, and the differential emotion socialization of girls and boys with mothers and fathers.

References

Denham, S. A., Bassett, H. H., & Wyatt, T. (2007). The socialization of emotional competence. In J. Grusec & P. Hastings (Eds.), *The Handbook of Socialization* (pp. 614–637). New York: Guilford Press.

Mehl, M., Pennebaker, J.W., Crow, D.M., Dabbs, J., & Price, J. (2001). The Electronically Activated Recorder (EAR): A device for sampling naturalistic daily activities and conversations. *Behavior Research Methods, Instruments, & Computers*, 33, 517–523.

Pennebaker, J.W., Booth, R.E., & Francis, M.E. (2007). *Linguistic Inquiry and Word Count: LIWC2007*. Mahwah, NJ: Erlbaum. www.liwc.net

94 Intention or attention before pointing: Do infant's early hold out gestures reflect evidence of a declarative motive?

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Gestures are the first signs of conventional communication within pre-linguistic infants and can reflect various motives. Gestures with a proto-declarative motive display an understanding that others can

share attention and interest in an external referent. This is a uniquely human trait and has been linked to later language development (Cochet & Vauclair, 2010). Previous research on the pointing gesture suggests that declarative pointing develops around 12 months, however this may not reflect the earliest onset of this skill. Precursory gestures, such as holding out a toy, may reflect a similar declarative motive. We investigated the motives behind these earlier gestures, to establish whether from 10 months infants use 'hold out' gestures declaratively (i.e. to share and direct the attention of the adult onto an interesting object).

The study was based on the methodological paradigm of Liszkowski and colleagues (2004; 2006). Infants were placed in an experimental setting aimed at eliciting a 'hold out' gesture in a declarative context. The experimenter then reacted to these gestures in different ways and the infant's responses were recorded. Measures such as vocalisations, repetitions, visual-checking and object manipulation were coded. Results revealed that when the experimenter engaged in joint attention, sharing an interest in the object, infants were significantly more likely to repeat their hold outs and display a positive attitude. In contrast, all three of the other conditions invoked a significantly higher number of dissatisfied behaviours, including negative expressions, vocalisations and attention directing behaviours. This suggests that infants develop proto-declarative, communicative behaviours earlier than previously assumed, resetting the age at which these more complex skills develop.

References

Cochet, H., & Vauclair, J. (2010). Pointing gesture in young children: Hand preference and language development. *Gesture*, 10(2-3), 129–149.

Liszkowski, U., Carpenter, M., Henning, A., Striano, T., & Tomasello, M. (2004). Twelve month olds point to share attention and interest. *Developmental science*, 7(3), 297–307.

Liszkowski, U., Carpenter, M., Striano, T., & Tomasello, M. (2006). 12- and 18-month-olds point to provide information for others. *Journal of Cognition and Development*, 7(2), 173–187.

95 Children's past and future accounts in interactional situations. A study with young children from marginalized urban populations in Argentina

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This study aims to analyze past and future accounts that 4-year-old children from marginalized urban populations in Argentina produced in interaction with an older child and individually. The theoretical perspective (Nelson, 2007) assumes that discourse development involves interaction with discourse models provided by cultural partners. Within this perspective, studies have shown differences between future and past accounts produced by children in adult-child interaction (Hudson, 2002). The data consists of 80 accounts -40 past accounts and 40 future accounts- produced by 20 4-year-old children in two conditions: interaction with a 12-year-old child and individually. The data was video-recorded. Through a qualitative analysis we identified 3 types of sequences employed by the 4 year old children in the construction of the accounts: 1) temporally ordered sequences; 2) descriptive sequences; 3) enumerative sequences. A logistic regression was carried out. Then a conversational analysis of the interactions was carried out. Results showed interaction effects between the type of account and the condition regarding the use of temporally ordered sequences ($\beta=-3.25$, $SE=0.61$, $z=-5.3$, $p<.001$) and the enumerative sequences ($\beta=2.02$, $SE=0.60$, $z=3.37$, $p<.001$). A cross-interaction was found regarding the temporally ordered sequences: while individually the children employed less temporally ordered sequences in the future accounts than in the past accounts, in the interaction condition they employed more temporally ordered sequences in the future accounts. Meanwhile, the children in the individual condition used more enumerative sequences in the future accounts than in the past accounts. These differences could be understood taking into account conversation analyses results, which showed that the older children offered more scaffold in the construction of the future accounts. This could be due to the greater difficulty implied in the production of a foreseen account which represents an event that has not yet occurred.

References

Hudson, J. A. (2002). Do you know what we're going to do this summer? Mother's talk to young children about future events. *Journal of Cognition and Development* 3, 49-71.

Nelson, K. (2007). *Young Minds in Social Worlds. Experience, meaning and memory*. Cambridge: Harvard University Press.

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Cognitive load and linguistic structure can influence timing phenomena in child speech. In a previous study of disyllabic babble and first words in infants with cochlear implants (CI) and normally hearing infants (NH), infants with CI had more isochronous vowel ratios in words than babble. Following Snow (1994), it was assumed this was due to a reduction of final syllable lengthening.

In the present study we sought to localise the durational changes in syllables and segments which gave rise to this isochrony. Monthly recordings of 9 NH infants and 9 infants with CI were analysed from the onset of babbling until infants reached a cumulative vocabulary of 200 words. Isolated disyllabic babble and first words were segmented into consonantal and vocalic areas in waveforms and durations measured in praat textgrids. Raw durations were converted to percentages of vocalic and consonantal intervals in words and each syllable.

Results indicated that contrary to predictions, groups did not differ on the percentage of the second vowel in words or babble. The speech of the infants with CI did not contain overall smaller consonantal percentages at the word nor at the syllable levels. Instead, isochrony was driven by changes to the first vowel: infants with CI made significantly greater increases to the first vowel percentage in words compared to babble, and in comparison to words from the NH group.

For infants with CI, the effort of attempting to match an adult target may cause equal weight to be given to each syllable. Snow (1994) suggested this occurs at the transition from single- to multiwords in NH children, but we propose that such micro-disturbances in rhythm may operate more widely when there is a transition to greater linguistic complexity.

96 Timing on the cusp of words

97 Human infant sensitivity to trans-species emotional vocal signals

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For many species, transmitting emotional signals is a fundamental function of vocal communication. Morton proposed that there is a general relationship between the «physical structures of sounds» and the motivation underlying their use in animal communication (1). If true, it implies that emotional signals conveyed by vocal signals may share common characteristics among different species. By 5-months, human infants can respond appropriately for emotions conveyed by speech prosody (2). If, as Morton proposed, there are trans-species characteristics in emotional vocalization, it is possible that human infants show sensitivity to trans-species emotional vocal signals.

To test this prediction, in 3 experiments, 5- and 9-month old Japanese infants, 20 in each, were tested using the Head-Turn Preference paradigm (HPP). The vocalizations of song sparrow, the swamp sparrow and the rodent were chosen which were produced in either a positive (pleasure, contact) or negative (distress, alarm) context. First, Infants in both age groups listened longer to negative vocalization of rodents than the positive ones [$F(1, 38) = 161.37, p < .01$]. For song sparrow vocalization, infants at both ages listened to positive vocalizations longer than the negative ones [$F(1, 38) = 30.5, p < .01$]. For swamp sparrow vocalization, 5-month olds but not 9-month olds listened longer to the negative ones [$F(1, 19) = 2.39, P < 0.05$]. These results support Morton's Motivation Structure Rule Hypothesis, suggesting that there exist trans-species characteristics in emotional vocalization. In addition, it shows that human infants possess early sensitivity to the physical characteristics of such vocalization. It remains unclear whether they associate such characteristics with emotive content that bears any relation to the intent of the original signal.

References

Morton, E. S. (1977). On the occurrence and significance of motivation-structural rules in some bird and mammal sounds. *The American Naturalist*, 111(981), 855-869.

Fernald, A. (1993). Approval and disapproval: Infant responsiveness to vocal affect in familiar and unfamiliar languages. *Child development*, 64(3), 657-674.

98 Efficacy of phonological therapy in Dutch monolingual children with SLI

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Introduction

At Royal Dutch Kentalis young children with severe phonological disorders are diagnosed and treated intensively in the Speech and Language Center. These children with SLI are referred to Kentalis because their speech doesn't improve satisfactorily, despite regular speech and language therapy.

Research question

Do children with SLI benefit from specific phonological therapy?

Methods

In this study 70 children with a phonological disorder are followed. A standardised method for phonological analysis is used in order to determine the acquired grade of contrasts in phonological development and the occurrence of phonological simplification processes (Beers, 1995).

PCC (Shriberg & Kwiatkowski, 1982) and PMLU (Ingram, 2002) are used as measures to examine the severity of the disorder and to examine whether specific phonological treatment is successful. The ability to produce grammatically correct and complex utterances and the ability to narrate the plot is analysed in a story generation task (Frog story). The parents were asked to fill in the questionnaire CCC-2-NL. All children are tested at the start of the treatment as well as 6 months after specific phonological treatment, including parental guidance.

Results

The results show that most children grow substantially in their phonological skills. Significant results are found for: grade of contrast, frequency of phonological simplification processes, PCC and PMLU.

It is also shown that growth in PCC coincides with growth in PMLU. The observed communicative behaviour confirms these positive change in speech production. Better phonological representations seem to lead to the use of more complex word forms. When a child's phonology grows it is able to use longer sentences and to tell more plot elements in narrating a story.

Conclusion

For children with severe phonological disorders, specific phonological therapy is needed to improve intelligible speech. Their language system grows at both word and sentence level, leading to better language skills.

References

- Beers, M. (1995) *The Phonology of Normally Developing and Language-impaired Children*. Studies in language and language use, vol. 20. Den Haag: HAG.
- Ingram, D. (2002) The measurement of whole-word productions. *Journal of Child Language*, 29, 713-733.
- Shriberg, L., and Kwiatkowski, J. (1982) Phonological disorders III: a procedure of assessing severity of involvement. *Journal of Speech and Hearing Disorders*, 47, 256-270.

99 "¿What?", "¿What do you mean?" A longitudinal study of the repair movements in spontaneous conversations between parents and children from Argentina

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The aim of the study is to longitudinally analyze the repair movements produced in parent-child conversations at home. Previous studies mainly carried out in experimental settings with English speaking population showed the relevance of repair practices for language development and communicative skills (Corrin, 2010).

The data of the present study consists of 56 conversations during mealtime and storybook reading situations audio-recorded in the homes of 12 middle-income children from Argentina when they were 2;6, 3 and 3;6 years old. A qualitative analysis was carried out combining the Grounded Theory and conversation analysis. We also carried out a multiple regression analysis considering different aspects of the repair movements as dependent variables (who initiated the repair movement, type of repair, response to the repair, among others) and age and type of situation as predictors.

Results showed that in both situations and in the three moments considered there prevailed extended and specific repair movements that adopted the form of questions and that the children responded providing more information that contributed to restoring mutual comprehension. The multiple regression analysis showed that both age ($p < .001$) and type of situation ($p < .001$) are significant predictors of the variation in the repair movements initiated by fathers ($F(3,52)=8.2$, $p < .001$, $R^2=0.28$). Also, the type of situation is a significant predictor of repair movements that adopt the form of questions ($F(3,52)=1.2$, $p < .01$, $R^2=0.06$) and of the children's responses that adopt the form of assertions/negations ($F(3,52)=4.3$, $p < .001$, $R^2=0.2$).

Conceivably, repair practices observed in this population facilitate the children identifying the source of the breakdown and providing more information to solve it. Results also show it is necessary to consider both age and type of situation.

References

- Corrin, J. (2010). Hm? What? Maternal repair and early child talk. In H. Gardner & M. Forrester (Eds.), *Analyzing interactions in childhood. Insights from conversation analysis* (pp. 23-42). Sussex: Wiley Blackwell.

100 He Said, She Said: Children use speaker identity, but not disfluency cues, in word learning

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Once thought to be an extraneous aspect of language, filled pauses (e.g., uhh, umm) can play an important role in facilitating real-time comprehension. Specifically, filled pauses in referential descriptions can lead both children and adults to rapidly anticipate reference to objects that likely caused the speaker's production difficulty (discourse-new and/or novel objects). These referential cues could plausibly have additional consequences, such as guiding the process of word learning. Using an eye-tracking paradigm, we introduced 5-year-olds and adults to two characters with distinct color preferences (pink/blue, see Creel, 2012). Participants then heard these characters (i.e., the characters were not visible) use a novel noun to refer to either a pink or blue novel object in a display, using either fluent (e.g., "Look at the blicket") or disfluent (e.g., "Look at thee, uhh, blicket") instructions. Both 5-year-olds and adults demonstrated a

tendency to fixate the novel object associated with the speaker-preferred colour in the initial part of the utterance ("Look at"), indicating they could use speaker identity cues in the speech stream to form potential word-object mappings. This expectation persisted when the remainder of the instruction was fluent. Disfluent instructions, however, led adults, but not children, to amend their prediction: Upon hearing "thee, uh," adults looked less at the objects with the speaker-preferred colour. Thus, disfluency cues biased adults, but not children, against the preferred-coloured objects as the most probable candidate for the novel word. Children, on the other hand, relied exclusively on the identity and associated preference of the speaker to map novel words onto novel objects. Given independent evidence that children resist forming word-referent mappings from uncertain sounding speakers (e.g., Sabbagh & Baldwin, 2001), the finding that disfluencies in individual utterances have little effect on moment-to-moment processing helps clarify the thresholds governing the use of informational cues in word learning.

References

Creel, S. C. (2012). Preschoolers' use of talker information in on-line comprehension. *Child Development*, 83(6), 2042-2056.

Sabbagh, M. A., & Baldwin, D. A. (2001). Learning words from knowledgeable versus ignorant speakers: Links between preschoolers' theory of mind and semantic development. *Child Development*, 72(4), 1054-1070.

101 Evaluative expressions used for argumentation in low and mid SES child-child interactions

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In this presentation, we report how children use evaluative and evidential expressions for their argumentative strategies when they participate in confrontational interactions. Previous studies have addressed the early development of argumentative abilities (Eisenberg, 1987; Stein & Albro, 2001), but they have not analyzed the uses of evaluative language in children's earliest argumentations. The present study aims to fill this gap. Our data consists of 79 disputes between 4 dyads of 4 to 6 year-old

children (2 dyads were mid SES, and 2 low SES). The two mid SES dyads participated in 43 disputes and the low SES dyads in 36. The interactions were audio-registered in natural play situations in the children's home environment. Data was transcribed according to CHAT and analysed using the CLAN Program (MacWhinney & Snow, 1985). The analysis seeks to answer: a) how preschool children use evaluative language (defined as the use of evaluative and evidential resources) in order to produce arguments in a dispute; b) how uses of these evaluative expressions vary according to the children's SES. The analysis considered the role played by each child in the dispute (proponent or opponent), the type of argumentative strategy used (reiteration, narration, anticipation, description, generalization, mitigation or intensification, alternative proposal, appeal to authority) and the resources of evaluation (emotion, cognition, intention, reported speech) and evidentiality (source of knowledge, mode of knowing, intensifiers and mitigators) employed. Results showed that, regardless of social group, children resort to evaluative language when they construct their argumentative strategies. Nevertheless, in mid SES disputes, we identified a greater quantity and variety of argumentative strategies and a more frequent use of resources of evaluation and evidentiality.

References

Eisenberg, A. (1987). Learning to argue with parents and peers. *Argumentation*, 1(2), 113-125.

MacWhinney, B., & Snow, C. (1985). The child language data exchange system. *Journal of child language*, 12(02), 271-295.

Stein, N. L. & Albro, E. R. (2001). The Origins and Nature of Arguments: Studies in Conflict Understanding, Emotion, and Negotiation. *Discourse Processes*, 32 (2&3), 113-133.

102 Czech Deaf children's socio-cognitive and pragmatic competence assessed through Theory of Mind Task Battery

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Notwithstanding the substantial progress in the empirical research on deaf children's development, claims about deafness as a major developmental impediment are still pervasive in the medical discourse of the present day Czech society. Deaf have

been declared to reach lower cognitive milestones compared to their hearing peers. Deafness has thus been a blame for the failure of reaching cognitive potentials of these individuals vis-à-vis the mainstream societal standards.

In a review of over 20 studies, Peterson (2009) demonstrates that even 11-year-old severely deaf children with hearing parents pass standard tasks assessing their social cognition, usually mastered by typically developing 5-year-olds. These marked delays come in a sharp contrast with little or no delay documented in deaf children of signing parents. This may be due to the richness of their conversational input during their early ontogeny (e.g., Harris 2006).

Our study has been testing Czech deaf and hearing children's respective skills in theory of mind (ToM). To this date, 40 deaf children (20 Czech Sign Language users and 20 users of spoken Czech) and 20 hearing children were tested on the adapted battery of ToM skills (Hutchins & Prelock, 2010), assessing children's socio-cognitive skills including their understanding of others' beliefs, desires, emotions, and intentions. These skills are central to children's pragmatic language competencies.

Preliminary results seem to confirm our hypothesis in that Deaf Czech Sign language users are as competent as their hearing peers in their performance on the ToM battery of tasks, in a contrast to the Deaf users of spoken Czech.

As a first endeavor of this kind in the Czech Deaf community, our aim has been to document that deaf individuals can, indeed, reach the full potential as can their hearing peers, provided they have the tools to communicate with and represent through a complex independent language in whatever modality.

References

Harris, P. L. (2006). Social cognition. In W. Damon & R. M. Lerner (Eds.), *Handbook of child psychology*. Volume 2. Cognition, perception, and language (pp. 811–858). Hoboken, NJ: John Wiley & Sons.

Hutchins, T. F., & Prelock, P. A. (2010). Theory of Mind Task Battery. <http://www.theoryofmindinventory.com/task-battery/> (accessed 9 September 2015).

Peterson, C. C. (2009). Development of social-cognitive and communication skills in children born deaf. *Scandinavian Journal of Psychology*, 50, 475–483.

103 Perception of level tones and contour tones by French-learning infants

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Studies with non-tone-learning infants reported early discrimination of lexical tones and decline in tonal discrimination from around 6 months of age (e.g., Mattock, et al., 2008, Yeung, et al. 2013; Liu & Kager, 2014), but no decline in some studies (Shi et al. 2017; Tsao, 2017). The tonal contrasts in those studies were between level and contour tones or between contour tones. Level tones and contour tones are treated differently in linguistic theory (e.g., Yip, 2002). Level tones are simpler in phonological structure (e.g., high and low features) than contour tones (containing combined features, e.g., low-high for rise). However, contour tones may be acoustically more distinct and auditory more salient than level tones. We hypothesized that towards age one non-tone-learners process lexical tones non-phonologically, and perceive contour tones better than level tones.

To examine these factors (phonological versus acoustic saliency), we tested French-learning 11-month-olds' perception of a level-tone contrast (high versus low) and a contour-tone contrast (rise versus fall) in Mandarin, using HPP. Stimuli were monosyllables (fa, qie, peng, wang) each in high, low, rise and fall tones, sliced from bi-syllabic words (the adjacent second syllables being a high tone). The context was necessary for obtaining the low tone. Infants were either in the level-tone group or contour-tone group. Within each group, half of the infants were familiarized with one tone (e.g., high), and the other half with the other (e.g., low); all infants were tested with new exemplars of the two tones (e.g., high versus low).

Results show that looking times to familiarized versus non-familiarized tones in test trials differed for contour tones ($p=.01$), but not for level tones. Thus, infants focused on acoustic saliency of the tones rather than their phonological characteristics. Contour tones were discriminable despite segmental variability. Segmental variability seemed more costly for level tone discrimination.

References

Mattock, K., Molnar, M., Polka, L., & Burnham, D. (2008). The developmental course of lexical tone perception in the first year of life. *Cognition*, 106, 1367–1381.

Shi, R., Santos, E., Gao, J., & Li, A. (2017). Perception of similar and dissimilar lexical tones by non-tone-learning infants. *Infancy*. doi: 10.1111/infa.12191

Tsao F-M (2017) Perceptual Improvement of Lexical Tones in Infants: Effects of Tone Language Experience. *Front. Psychol.* 8:558. doi: 10.3389/fpsyg.2017.00558

Yeung, H. H., Chen, K. H., & Werker, J. F. (2013). When does native language input affect phonetic perception? The precocious case of lexical tone. *Journal of Memory and Language*, 68(2), 123–139.

Yip, M. (2002). *Tone*. Cambridge: Cambridge University Press.