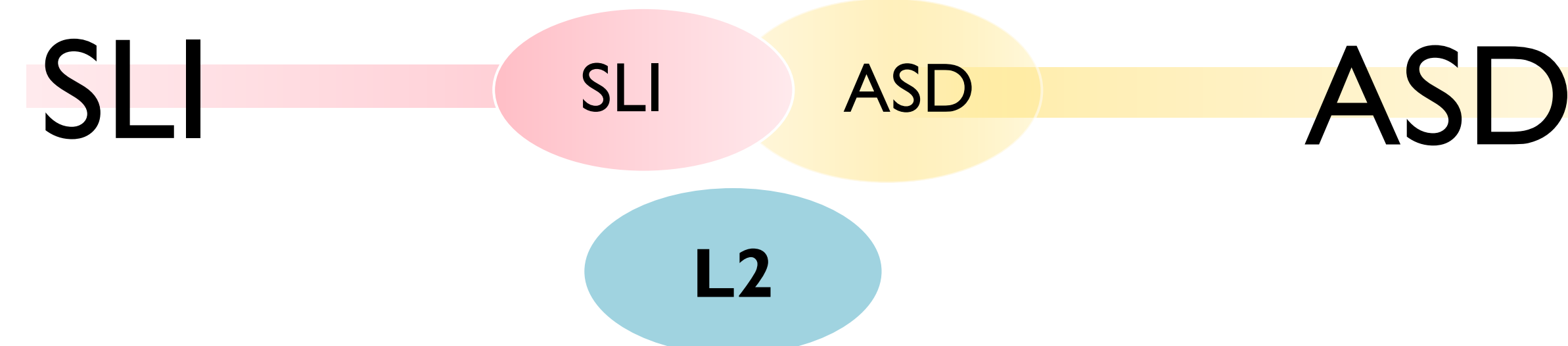


## Introduction

Studies (Bartak et al., 1975; Cantwell et al., 1978) investigating language, cognition, and behavior in children with Autistic Spectrum Disorder (ASD) and children with Specific Language Impairment (SLI) suggested clear differences between these two groups. Kjelgaard et al. (2001) showed that among the children with autism there was significant heterogeneity in language skills.

**Debate** : children with ASD have the same language profile as children with SLI **OR** these children present a delayed acquisition rather than a deviancy (Tager-Flusberg, 1981; Tager-Flusberg et al., 1990).

**Objectives** : to determine whether one aspect of atypical language development in ASD (i.e. phonology) is only characterized by a simple delay in development or if it also shows some similarity with structural language impairment found in children with SLI.



A group of English-speaking children that were acquiring French as a second language will be used as a 'standard' for a delayed acquisition compared to typical French speaking children.

## Participants

3 groups of children tested: ASD, SLI and L2 (L1 English, L2 French)  
Only participants with atypical development (on average scores below 2 SD) were considered:

Group	N	Age range	Mean age (SD)	Length of exposure (SD)	Age of acquisition (SD)	Phonology Mean Z-score
ASD	17	6;4-12;9	8;9 (1;8)	-	-	-5.1
SLI	28	6;5-12;11	9;6 (2;9)	-	-	-7.1
L2	26	6;4-12;7	9;6 (1;9)	29 mo (14mo)	7;8 (1;9)	-2.65

## Task

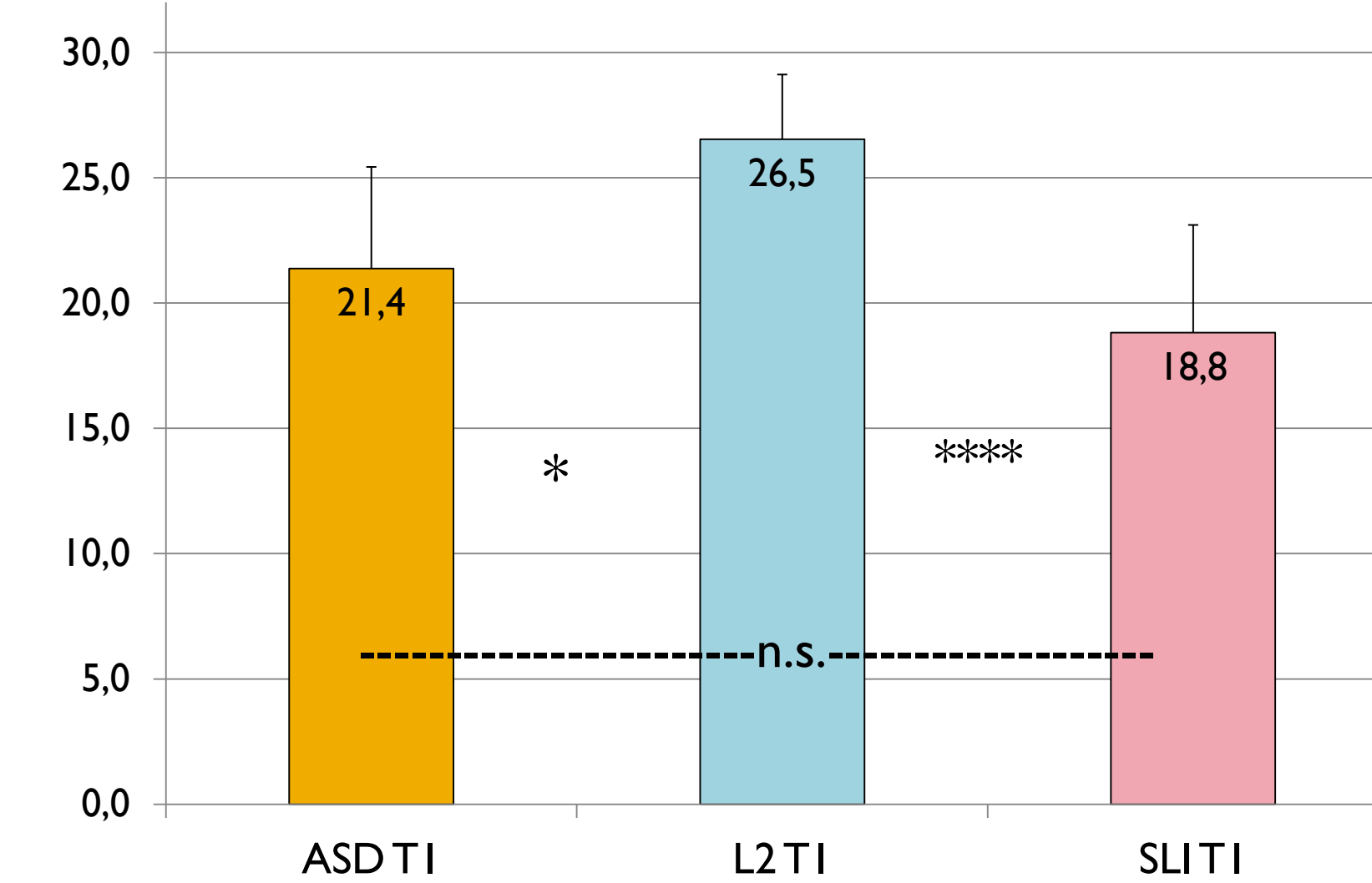
- Short-version of the Word Repetition Task (WR) from the BILO-3C (Khomsy et al., 2007) used to assess phonology by clinicians
- Some unfamiliar words work as non-words (e.g.: *moissonneuse-batteuse* 'combine harvester', *kiosque* 'kiosk', *réservoir* 'tank')
- No explicit control of phonological complexity was used during test building

Nb Words	Mean Nb phonemes	Mean Nb Syllables	IPC mean
32	6.9 (3-13)	2.7 (1-6)	6.8 (1-15)

## Measures

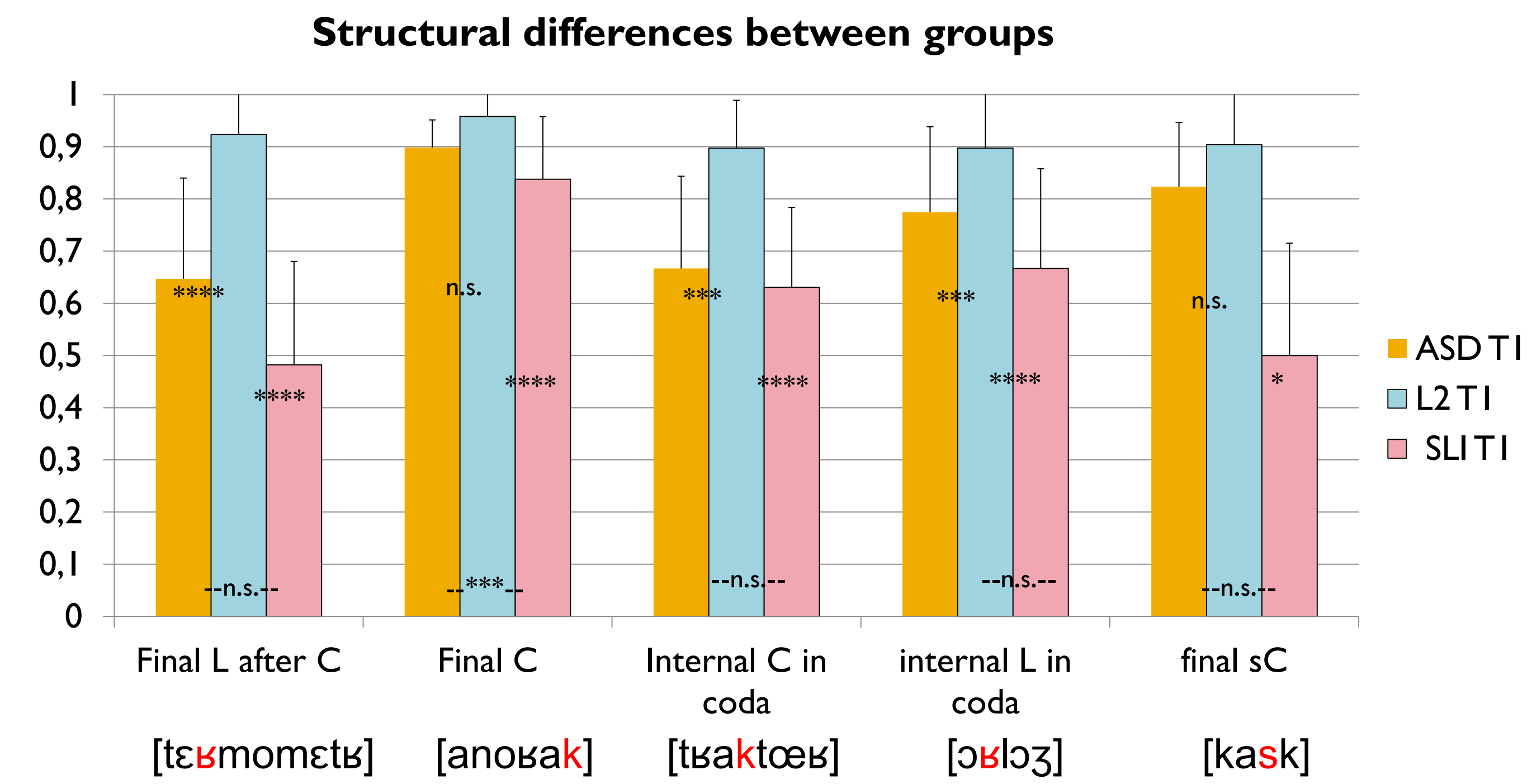
- Score per item (0/1)
- Index of Phonological Complexity (IPC): IPC score is composed of 8 production-based indices calculated at the word-level. These indices reflect the relative complexity of the segmental variation within a word
- Errors according to phonological position (each phoneme is coded according to its position in the word produced and its position in the syllabic structure)

## Correct productions (raw scores /32)



Overall results show that children with SLI have significantly more difficulties repeating items, and that children with ASD perform like L2 children

## Overall results



- ASD sometimes behave like L2, but are rarely significantly different from SLI (due to heterogeneity)
- A consonant in syllable final position ('album' or [al.bɔm] or 'tracteur' [tʁak.tœʁ]) (coda position) implies increases of errors in ASD and SLI children

→ Structures that distinguish the 3 groups are more complex and always involve a consonant in a specific ('complex') syllabic position

→ Patterns of production are specific to each group

## Sources of difficulties

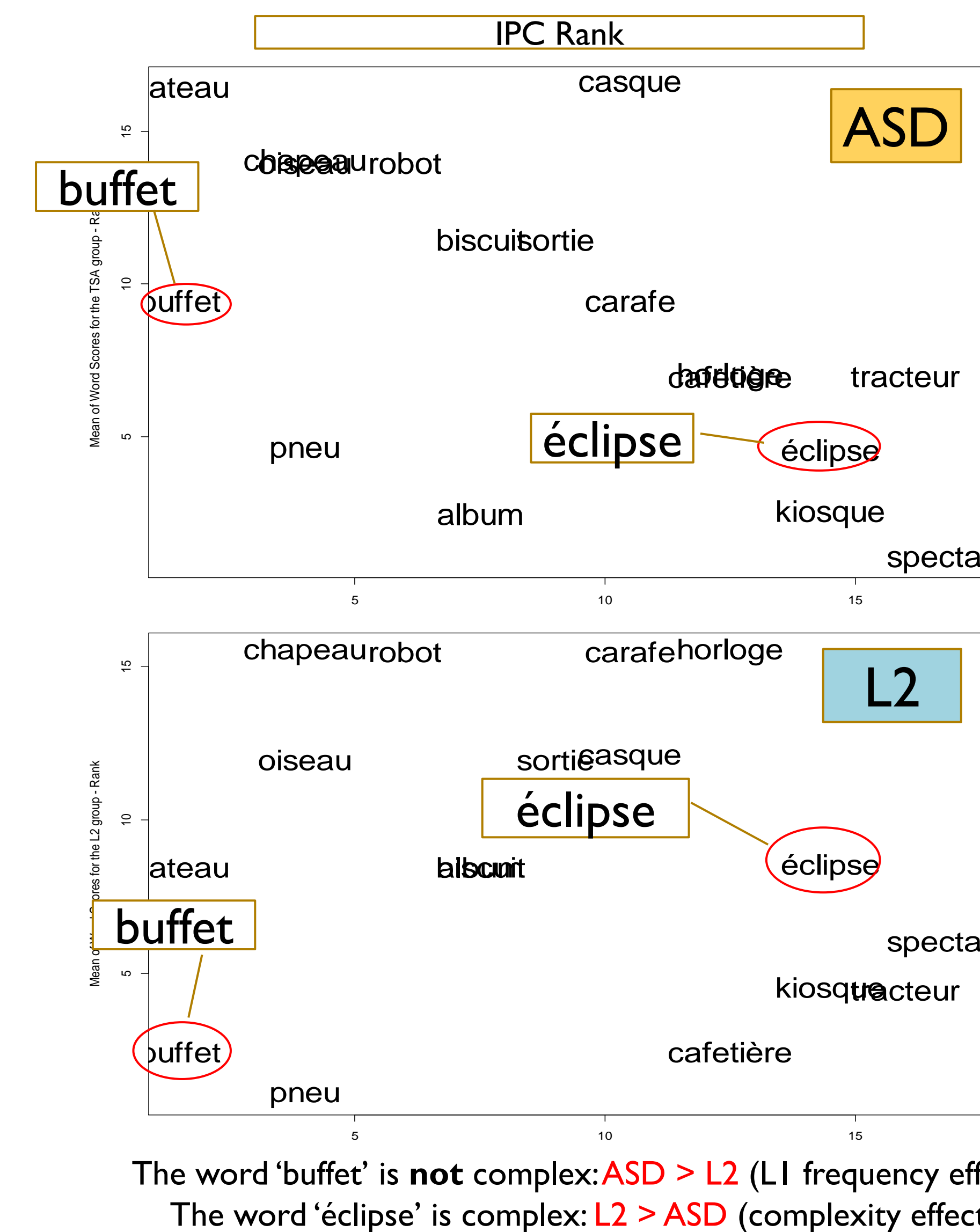
### Possible predictors of language development

- Short-term memory in terms of word length (# syllables) - Gathercole & Baddeley (1990)
- Input Frequency - Pierrehumbert (2003)
- Index of phonetic complexity - IPC - Jakielski (1998)
- Syllabic structure - Rose (2000)

Word length x score	ASD	L2	SLI
$r_s$	-0.25	-0.47	-0.17
p-value	0.16	0.01	0.33

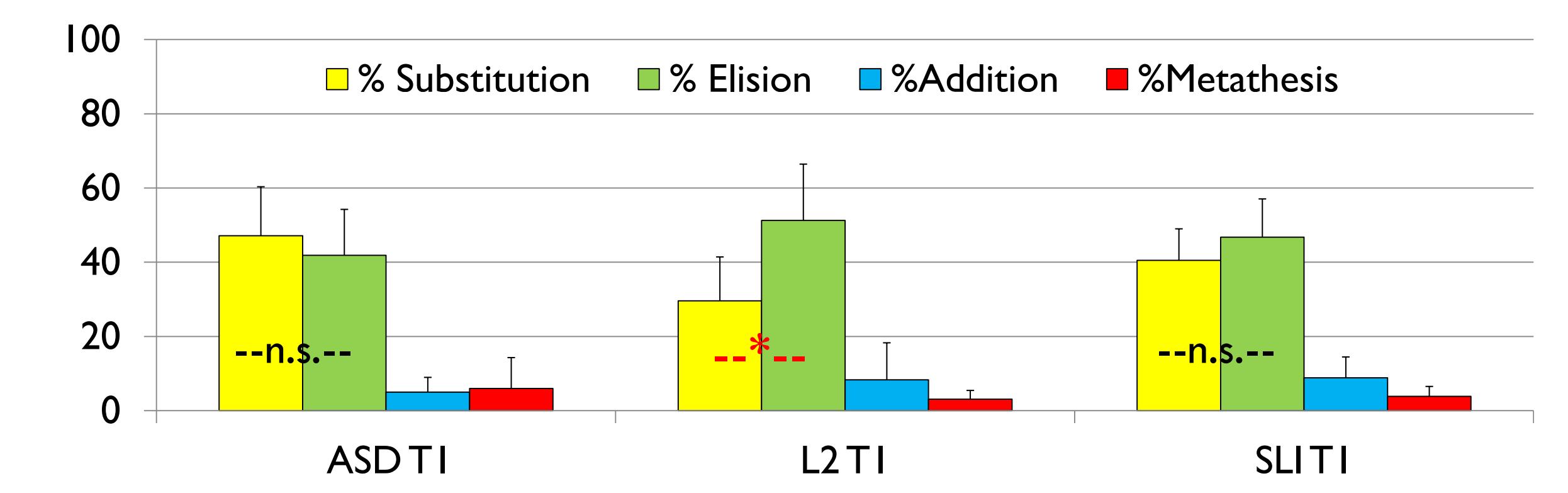
IPC x score	ASD	L2	SLI
$r_s$	-0.60	-0.10	-0.74
p-value	0.01	0.69	p < 0.01

- Phonological complexity affects ASD & SLI more than L2
- Length affects more L2 than ASD & SLI



The word 'buffet' is **not** complex: ASD > L2 (LI frequency effect)  
The word 'éclipse' is complex: L2 > ASD (complexity effect)

## Patterns of errors



ASD group is only different from L2 group in the use of substitution (Z=2.27, p=.02)

- ASD group uses similar patterns as SLI group
- L2 show preference for elision
- Focus on elision:
  - ASD & SLI groups omit phonemes
  - L2 omit syllables

## Progression one year later (T1 vs T2)

The scores for each group are increasing but the only group that shows a significant difference between T1 and T2 on overall score in the short version of the task is the L2 group. (p<0.001)

## Conclusions

- Productions of participants with pathology are more influenced by phonological complexity than length, as opposed to L2 children
- Children with SLI and ASD are sensitive to consonants in syllable final position. Syllabic complexity plays a role in their segmental deficit
- Phonology is affected in children with ASD and the way it is affected is comparable to productions of children with SLI on many points

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## Further information

About this study, the team and current projects :

