

Early lexical accuracy patterns: Considerations on emergence of diversification for message transmission

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Abstract

It has been proposed that patterns found in earliest infant vocal sequences can provide a window on initial steps into vocal communication by ancestral speakers. These early infant patterns have been characterized as affording a view of the vocal system at the most basic level of operation in producing serial sequences (MacNeilage & Davis, 2000). Studies of the pre-linguistic babbling and early word periods have outlined this phonetic substrate for consonants and vowels as well as for inter- and intrasyllabic regularities (e.g. Davis & MacNeilage, 1995; Davis et al. 2002). Results indicate the strong presence of labial and nasal stop consonants and glides and vowel qualities in the lower left quadrant of the vowel space. Intrasyllabic regularities include labials with central vowels, coronals with front vowels and dorsals with back vowels in English and across languages, consistent with little independent movement within syllables. Intersyllabic patterns include co-existence of reduplication and variegation across syllables. In variegated syllables, a predominance of height over front-back variation for vowels and manner over place variation for consonants is found. These inter- and intrasyllabic serial patterns are predicted based on the Frame-Content Hypothesis (MacNeilage & Davis, 1990) where the jaw is seen as the principle articulator responsible for rhythmic alternations between consonants and vowels with little independent movement of other active articulators within sequences.

Fewer studies have examined how this widely described set of phonetic patterns is manifest in emergence of accuracy at the onset of word use. Patterns of accuracy and errors are manifest in infants' first excursion into matching of their vocal production system capacities with meaning in the early word period. Analysis of these early accuracy and error patterns can also afford a preliminary look at how ancestral speakers may have began the diversification process from initial vocal communicative capacities into a message transmission system eventually constrained by the need to achieve optimal trade-offs between speed of transmission and perceptual distinctiveness. Not all aspects of ontogeny and phylogeny are consistent in this ontogeny-phylogeny comparison. Child learners have external models and acquire their language in a rich communicative environment. In contrast, early speakers may not have been afforded such models. However, pressure on the production system to attach to and begin to elaborate more diverse meanings is in common in the two groups. This consistency suggests that there can be a value to understanding the emergence of forms to support lexical diversification in child speakers for considerations of emergence of forms to support message diversification in early speakers.

Accuracy and error patterns for in the single word lexicon period will be described using data from 18 English learning infants. Data analyzed were collected as a part of a longitudinal study tracking typical speech development from the onset of canonical babbling through age three in English-learning infants. In the larger study, one-hour sessions were audiotaped in each child's home twice monthly. No structure was imposed on the normal household routine so that samples were based on spontaneous interactions.

Data were analyzed from the onset of single word use until emergence of two word utterances. Age of onset for words varied between 11.5 and 14 months and extended to 14-24 months across the infants studied. Based on previous studies of the larger corpus, phonetic data for these infants during the prelinguistic babbling period was available. This baseline of information for the same children during an earlier period of development affords an understanding of how they employ available pre-linguistic production patterns for new functions at the onset of word use. Accuracy and error profiles for segments, word shapes, intrasyllabic consonant vowel associations, and intersyllabic consonant-consonant and vowel-vowel relations were analyzed

Results indicate that patterns of highest accuracy in early word use in these children are strongly motivated by behaviors already available within their production system capacities from the pre-linguistic babbling period, rather than being driven by patterns found in the targets they are attempting. This type of result supports the assertion that early accuracy patterns reflect use of available capacities for new functions, consistent with the Neo-darwinian principal that evolutionary change is founded on extension of existing capacities into new broader functions. Issues related to ontogenetic-phylogenic comparison will be raised based on these results for acquisition.

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