

Grammatical restrictions on lexical avoidance in children’s phonological acquisition

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Introduction Many case studies of phonological acquisition report evidence of *lexical avoidance* (or *lexical selection*), whereby early learners avoid words with difficult or marked phonological structures – meaning that they not only repair such structures in production, but also fail to attempt target words that contain them (e.g. Ferguson and Farwell, 1975; Menn, 1983; Vihman, 1993; Schwarz and Leonard, 1982; Schwarz *et al.*, 1987.) A few longitudinal studies have documented this avoidance through statistical comparison with the lexicon: for instance, Adam and Bat-El (2009) report a Hebrew-learning child at 1;02-1;05 who most often attempted multi-syllabic words with penultimate stress (e.g. *banána*) even though the ambient lexicon’s most common stress pattern is word-final (e.g. *todá*, ‘thank-you’).

Questions and Hypotheses One appealing pre-theoretic idea is that young children avoid words that their current linguistic system deems too complex overall – but what are the potential sources of complexity that can interact with a child’s lexicon in this way? This paper advances the claim that lexical avoidance is derived directly within the phonological grammar, captured here using OT constraints, and that lexical avoidance can only occur when forced by the conflict between high-ranking phonological constraints (see below).

To support this claim, we present initial analyses of spontaneous English speech from Rowan (a child in PhonBank’s Davis corpus), comparing one-word vs. multi-word utterances. Some early studies suggested that a child’s restricted phonological system can delay the appearance of multi-word phrases (see especially Donahue, 1986, also Waterson 1978). Here, we consider whether longer utterances *themselves* can drive avoidance – that is, whether Rowan avoids marked phonological structures in multi-word utterances as compared to one-word utterances – and whether any observed avoidance is attributable to the interaction of typologically-established phonological constraints.

Data and Methods Beginning with Rowan’s first multi-word utterances at 1;03.25, the corpus provides 26 sessions up to age 2;10 with a total of 3,059 utterances. These were divided into two analyzable groups – one-word utterances (1WUs, e.g. *car*) and multi-word utterances (MWUs, e.g. *fast car*) – and a third group of reduplicated utterances (e.g. *car car car*), which were excluded as ambiguous. From initial inspection of the data, we further focused on the early development of MWUs between 1;05 and 2;3; we removed the 251 reduplicated utterances from this period, leaving 1377 1WUs and 561 MWUs to analyze.

For each age range and utterance type, we compared the frequency with which Rowan attempted targets containing various complex or marked structures, including longer words, larger syllables and difficult consonants and sequences. We then calculated what proportion of the target words in the 1WU vs. MWU groups contained each structure; chi-squared tests of 2x2 contingency tables were used to examine whether the frequency of each structure was significantly different between the two utterance groups at each age.

Results Across all potential sources of complexity examined, the only clear source of lexical avoidance was target word length. Between 1;05-2;1, MWUs were less likely to contain multi-syllabic targets compared to 1WUs (1a). In contrast, the proportion of e.g. attempted complex onsets (1b) was unaffected by utterance size (note small sample at 2;2).

(1) Raw data		1;5-1;7	1;10	1;11	2;0	2;1	2;2	2;3
a) 1WU	Multi- σ words/ total words	139/403	47/255	158/468	27/105	16/67	2/13	8/49
MWU	Multi- σ words/ total words	5/64	17/145	104/351	28/237	35/283	5/79	65/382
b) 1WU	CompOnsets/ total words	24/403	33/255	56/468	14/105	4/67	3/13	2/49
MWU	CompOnsets/ total words	4/64	18/145	57/351	18/237	19/283	2/79	17/382

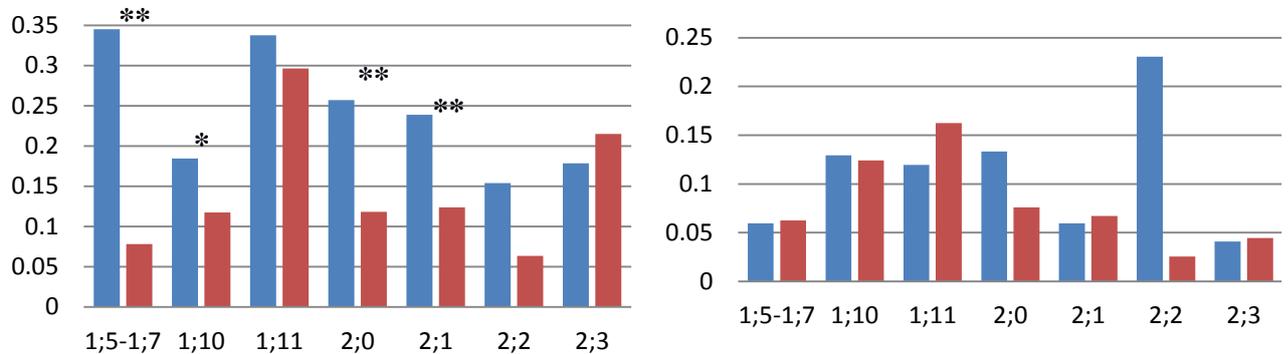
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The graphs below illustrate the proportion of multi-syllabic words (2) and complex onsets (3) by utterance group: at each age, 1WUs are shown on the left and MWUs on the right. Comparisons marked with ** are significantly different ($p < 0.01$) in the expected direction.

(2) *Proportion of multi-syllabic words*

(3) *Proportion of complex onsets*



Analysis The notion of lexical avoidance has been captured in the (adult) OT literature using the notion of a *null parse* candidate [⊙] (Prince and Smolensky, 1993, McCarthy and Wolf, 2007): an output with no phonological correspondence at all, which violates a single constraint M-PARSE (for use in child phonology, see van Oostendorp, 2009). M-PARSE can conspire with constraints that align word and phrasal edges (abbreviated below as ‘PHRASE=FOOT’) to drive avoidance of multi-syllabic words just in MWUs (5), as in (2):

(4) /fæst kai/ <i>fast car</i>	PHRASE = FOOT	MAX σ	M-PARSE	(5) /kiri kai/ <i>kitty car</i>	PHRASE = FOOT	MAX σ	M-PARSE
☞ (dæ.da)				(di.ri)(da)	*!		
(da)		*!		(da)		*!*	
⊙			*!	☞ ⊙			*

(A current follow-up study appears to rule out the confounding possibility that more mono-syllabic words are chosen in MWUs because they include more functional items.)

On the other hand, syllable structure constraints like *COMPLEXONSET are violated equally by structures in utterances of any size. As seen in the unranked tables below: any ranking will choose the same onset cluster treatment for a 1WU (6) as for a MWU (7), so *COMPLEX cannot cause avoidance only in the MWU scenario, in line with (3)’s result:

(6) /tʌk/	*COMP ONSET	M-PARSE	MAX-C	(7) /kiri tʌk/	*COMP ONSET	M-PARSE	MAX-C
tʌk	*			di.ri.tʌk	*		
tʌk			*	di.ri.tʌk			*
⊙		*		⊙		*	

Overall, this study provides evidence that children’s lexical avoidance arises through grammatical means, via a phonology equipped with the null parse – and that for learners, phonological complexity is not always created equal.

Selected References Adam, G. and O. Bat-El. 2009. When Do Universal Preferences Emerge in Language Development? The Acquisition of Hebrew Stress. *Brill’s Annual of Afroasiatic Languages and Linguistics 1* 255–282 * Donahue, M. 1986. Phonological constraints on the emergence of two-word utterances. *JCL* 13(2): 209-218. * McCarthy, J. & M. Wolf. 2007 Less than zero: Correspondence and the null output. In Curt Rice (ed.) *Modeling Ungrammaticality in Optimality Theory*. London: Equinox. * Schwarz R. and L. Leonard. 1982. Do children pick and choose? an examination of phonological selection and avoidance in early lexical acquisition. *JCL* 9: 319-336.