

INTER-CHILD VARIATION: THE INTERFACE BETWEEN PHONOLOGY AND MORPHOLOGY

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The talk will present a study of *inter-child variation* in the acquisition of Hebrew verb inflectional suffixes, based on longitudinal production data of four typically developing monolingual children. We will introduce two types of variation: (i) variation in the order at which suffixes appear in the children's speech; and (ii) variation in the selection of the base of the suffixes. We will argue that these two types of inter-child variation are the result of *phonology-morphology interface*, as they are contingent upon prosodic development. It is the prosodic structure that licenses the segmental content of the morphology, variation at the prosodic development leads to variation in the morphological development [1,2].

1. Variation in the order at which the suffixes appear in the children's speech is found with respect to the suffixes *-im* 'MS.PL.PRESENT' and *-ti* '1.SG.PAST' [3] presented in (1a). Morpho-syntactic theories [4,5,6] predict the order $im > ti$, since NUMBER is acquired before PERSON. However, two of the four children in our study acquired these suffixes in the reverse order, i.e. $ti > im$. Notably, this variation is not input-based, as it was found within a pair of twins, nor is it gender-based, as it was found between a girl and a boy (not siblings).

We attribute this variation to the pace of prosodic development, and more generally, to the conflicting predictions of phonology and morpho-syntax (2a): while morpho-syntax predicts the order $im > ti$, phonology predicts $ti > im$ for reasons: (i) the syllable structure of *-ti* (CV) is less marked than that of *-im* (CVC); and (ii) verbs with *-ti* are trochaic while verbs with *-im* are iambic (see (1)). We will provide quantitative data showing a correlation between the prosodic development and the production of suffixes, where the early production of *-ti* by two of the children correlates with the late development of word final codas or the iambic foot (final stress).

We thus claim that variation occurs when morpho-syntax and phonology make different predictions. To further support this claim, we studied two other suffixes, *-ta* '2.MS.SG.PAST' and *-tem* '2.PL.PAST' (1b), where both morpho-syntax and phonology predict the same order: $ta > tem$ (2b). As predicted, there was no variation with respect to these suffixes and all children acquired *-ta* before *-tem*.

2. Variation in the selection of the base is directly linked to the $im - ti$ variation, because the $ti > im$ children, who circumvented word final codas by producing *-ti* before *-im* had to confront the word medial codas that arise in verbs with *-ti*.

Most verbs in Hebrew are consonant-final (79% types and 64% tokens), where the attachment of a consonant-initial suffix like *-ti* yields a word medial coda (e.g. *gadal-ti* 'I grew'). However, Hebrew word-medial codas are acquired after word final codas [7], and if a child is producing *-ti* in order to avoid word final codas, how would she/he handle the word medial codas?

One way to handle the medial coda arising with the attachment of *-ti* is coda deletion (note that coda deletion is common in stems but almost non-existing in suffixes). The other option, more relevant to the present study, is selectivity [8,9,10]; i.e. the child selects targets that comply with his/her grammar. Indeed, our quantitative data show that the $ti > im$ children tend to select more vowel-final verbs than the $im > ti$ children (e.g. *ma't^hsa-ti* 'I found'). Here again, the inter-child variation in morphology is due to prosodic development.

3. We will conclude with a formal analysis within the framework of Optimality Theory [11] with reference to the null parse, which allows accounting for selectivity in both the suffixes and the base. The interaction of the phonological constraint NOCODA and the morphological constraint MPARSE, in addition to faithfulness constraints (MAX), will allow accounting for the variation at the phonology-morphology interface, where prosody licenses the segmental content of morphology.

(1)	<i>Suffix</i>	<i>Function</i>	<i>Example</i>	<i>Structure</i>	<i>Stress</i>
a.	<i>-im</i>	'MS.PL PRESENT'	<i>ʃár-im</i> 'they sing'	-VC	Final
	<i>-ti</i>	'1SG PAST'	<i>ʃár-ti</i> 'I sang'	-CV	Penultimate
b.	<i>-tem</i>	'2PL PAST'	<i>ʃár-tem</i> 'you pl. sang'	-CVC	Penultimate
	<i>-ta</i>	'1PL PAST'	<i>ʃár-ta</i> 'you ms.sg. sang'	-CV	Penultimate

(2)	<i>Prediction</i>	<i>Component</i>	<i>Markedness hierarchies</i>
a.	Variation	<i>-im</i> > <i>-ti</i> <i>-ti</i> > <i>-im</i>	Morpho-syntax Phonology
		<i>-ta</i> > <i>-tem</i>	Morpho-syntax Phonology
b.	No variation	<i>-tem</i> > <i>-ta</i>	CV < CVC <i>Not expected by any component</i>

- [1] Demuth, K. and E. McCullough. 2009. The prosodic (re)organization of children's early English articles. *Journal of Child Language* 36:173–200
- [2] Ettlinger M. and J. Zapf. 2011. The role of phonology in children's acquisition of the plural. *Language Acquisition* 18:294-313
- [3] Bat-El, O. 2012. Phonological constraints on morphological development: The acquisition of Hebrew verb inflectional suffixes. *Brill's Annual of Afroasiatic Languages and Linguistics* 4:189-212.
- [4] Shlonsky, Ur 1989. The hierarchical representation of subject verb agreement. Ms., University of Geneva.
- [5] Harley, H. and E. Ritter. 2002. Person and number in pronouns: A feature-geometric analysis. *Language* 78:45-69.
- [6] Armon-Lotem, S. 2006. Subject use and the acquisition of verbal agreement in Hebrew. N. Gagarina and I. Guelzow (eds) *Acquisition of Verb Grammar and Verb Arguments*, 269-291. Dordrecht: Kluwer Academic Publishers.
- [7] Ben-David, A. and O. Bat-El. 2016. Paths and stages in the acquisition of Hebrew phonological word. In R. Berman (ed.) *Acquisition and Development of Hebrew: From Infancy to Adolescence*, 39-68. Amsterdam: John Benjamins.
- [8] Schwartz, R. G., and Leonard, L. 1982. Do children pick and choose? An examination of phonological selection and avoidance in early lexical acquisition. *Journal of Child Language* 9:319-336.
- [9] Becker, M. 2012. Target Selection in Error Selective Learning. *Brill's Annual of Afroasiatic Languages and Linguistics* 4:120-139.
- [10] Shatz, I. 2018. *Phonological Selectivity in the Acquisition of English Clusters*. MA thesis, Tel-Aviv University.
- [11] Prince, A. and P. Smolensky, P. 1993. *Optimality Theory: Constraint interaction in generative grammar*. Technical Report, University of Colorado at Boulder and Rutgers University. (2004, Oxford, England: Blackwell Publishing).