

## PHONOLOGICAL SIGNS OF INFANT DUAL LANGUAGE ACQUISITION

Over the last six decades of research into child language acquisition, certain trends have been discovered and accepted as universals. For example, children tend to produce and show preference for certain sounds in their babbling sound productions (Locke 1983, de Boysson-Bardies 1984). All children grow through phases of physiological development that affect the sounds they are able to produce (Locke 1983). Once they start producing sounds of their own, they approximate the characteristics of their native language (de Boysson-Bardies et al., 1981, de Boysson and Vihman (1991). Yet, research on bilingual children's babbling is scant. And, empirical studies investigating the prosodic characteristics of infant babbling are fewer still. The purpose of this study is to determine whether the bilingually raised infant can make phonological –intonational- code choices.

This study is an empirical investigation of the intonational characteristics of one bilingual infant's sound productions at 1;1. Thirty-three sound recordings are examined for distinct pitch features in Praat and these characteristics are compared to the two native target languages (Spanish and English) as outlined by Delattre (1962). The results of this case study demonstrate that the child at 1;1 is predominantly using intonational characteristics that mimic Spanish. I believe that the reason for this finding is based on the child's exposure to more Spanish from his father during the time period under study. Comparatively, six months later, the infant's productions take on more English features, co-occurring with a period of time when the English-speaking mother was able to spend the same amount of time as the father caring for the infant. These findings supports a study by Vihman (1985), who found identical results with an English/Estonian child.

## Phonological Learning Bias in Tone Retention

In many languages, vowel hiatus is prohibited and resolved by vowel deletion. In Marghi, where vowels carry lexical tone, the tone of the deleted vowel is realized on the surviving vowel, which carries a contour tone (Hoffman 1963). Deletion of a High tone vowel before a Low tone vowel results in a falling tone on the surviving vowel as shown in (1).

(1) Margi Contour Tones

<u>Noun+Definite Article</u>	<u>Gloss</u>	<u>Tonal Pattern</u>
/ŋà+ári/ → [ŋǎri]	“the face”	/L+H.L/ → [LH.L]
/cédè+ári/ → [céděri]	“the money”	/H.L+H.L/ → [H.LH.L]

Goldsmith (1976) has claimed that contour tones are made up of a sequence of level tones. If this is correct, it would be surprising to find a language in which deletion yields the opposite pattern.

Following research which has suggested that it is easier to learn a natural phonological pattern than an unnatural one (for example, Wilson 2006) this experiment investigates the learnability of two artificial language patterns: the ‘natural’ pattern as in Marghi and the ‘unnatural’ pattern that is rare or unattested, as shown in (2).

(2) Two Tonal Patterns

Natural patterns:	H+L→HL	and	L+H→LH
Unnatural patterns:	H+L→LH	and	L+H→HL

An experiment was conducted with Chinese speakers who are familiar with tones but have no knowledge regarding this tone retention pattern, and English speakers as the baseline in case there are possible linguistic factors in Chinese that is affecting the learning of tonal patterns. The experiment consists of three sessions: tone discriminating session, learning session, and testing session. The participants first performed an ABX discrimination task to determine their ability to distinguish four tones: H, L, HL, and LH. Then in the learning session, they were trained to learn on nonsense words with a VCV structure. Each VCV word was associated with a picture of either an animal or a fruit, e.g. [ewe] ‘monkey’ with the tonal pattern [H.L] or [owu] ‘banana’ with [H.H]. Participants first heard the sound of the animal and the fruit along with the pictures, and then they were presented with two choices of the possessive noun phrase, one with the natural tonal pattern and one unnatural. For instance, [ewe] ‘monkey’ with [H.L] and [owu] ‘banana’ with [H.H] form the noun phrase [ewowu] ‘monkey’s banana’, which has two tonal patterns: the natural pattern [H.LH.H] and the unnatural [H.HL.H]. Participants were asked to hear both choices and judge which should be pronounced. Feedback was provided after each question to enhance the learning. Finally, in the testing session, participants were given novel forms of tonal patterns they have not heard in the learning session to see whether they make phonological generalization and extend it to novel forms. The prediction was that participants who learned the natural pattern will extend the pattern to novel forms while participants who learned the unnatural pattern will not necessary extend the pattern to novel forms.

The results suggest that Chinese speakers performed better in learning tonal patters than English speakers. Moreover, Chinese speakers who learned the natural pattern have a higher rate in extending the pattern to novel forms than Chinese speakers who learned the unnatural pattern. The results are consistent with the hypothesis of a learning bias toward cross-linguistically more common patterns.