

Analysis of variation in Mayan child phonologies

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Abstract

This paper uses the methods of consonant inventories and discriminant analysis to examine the variation in word-initial consonants produced by 24 children acquiring six Mayan languages. The range of variation in the consonants that children produce has significant implications for theories that predict children follow universal processes of consonant development as well as theories that predict individual children exhibit unique developments. The results show variation exists between children acquiring the same language as well as between children acquiring different languages. Both the qualitative and quantitative results demonstrate the structure of the adult phonologies restricts the range of the children's variation within each language even though the children omit a variety of word-initial prefixes. The investigation of language acquisition in related languages reveals how children's attention to the adult language limits the operation of both universal and individual processes.

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1. Introduction

Jakobson (1941/1968) viewed phonological development as a competition between the “unifying force” and the “particularist spirit.” On the physical level unifying forces derive from common features of motor development (Macneilage et al., 1997) as well as on a more abstract phonological level from feature markedness (Gnanadesikan, 2004). Jakobson, himself, claimed that “Whether it is a question of French or Scandinavian children, of English or Slavic, of Indian or German, or of Estonian, Dutch or Japanese children, every description based on careful observation repeatedly confirms the striking fact that the relative chronological order of phonological acquisition remains everywhere and at all times the same” (1941/1968:46).

The particularist spirit derives from individual children's cognitive propensities (Menn, 1983; Menn and Vihman, 2011; Macken and Ferguson, 1983). Vihman (2006) asserts that “the wide range of individual differences in this period [first words, CP] continues to resist coherent formulation in terms of universal phonetic or phonological principles, even across children acquiring a single language.” Straight proposed that “Phonology acquisition proceeds in a relatively piecemeal and idiosyncratic manner, despite presumably highly limited and homogeneous sources of input data from adult speakers” (1978:216).

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The competition between unifying forces and particularist spirits feeds into the debate between generative and constructionist theories of language acquisition. Generative theories propose universal processes of language development based on feature or constraint hierarchies (Bernhardt and Stemberger, 1998; Rose, 2009), whereas constructionist theories place greater emphasis on what individual children absorb from the input language (Lieven, 2010; Menn and Vihman, 2011).

Research into the effects of unifying forces and particularist spirits must address the range of variation in children's phonological productions. If language-independent unifying forces are major determinants of children's phonological inventories we expect to find little variation between children and across languages. On the other hand, if the particularist spirit predominates, we expect to find a great deal of variation between children acquiring the same or different languages. The issue of variation has interesting crosslinguistic implications. We might find that children follow the same process of phonological development in all languages or just in some languages. Children might also exhibit the same degree of variation across all languages or just in some languages. A crosslinguistic exploration of variation in child phonologies is an essential step to understanding how particularist spirits interact with unifying forces.

However insufficient attention has been devoted to the problem of crosslinguistic comparison (Pye, 2017). Corresponding phonetic segments in different languages may have similar voicing, place and manner of articulation features, but differ in strength, duration and attack features. Stress is realized by different combinations of duration, pitch and amplitude across languages. The “same” phonetic segments may be allophones of different phonemes and differ in their frequency of use and phonotactic constraints. The use of the same phonetic characters in studies of children acquiring different languages gives the false impression that the children have acquired the same phonological categories.

Finding similarities between children acquiring a few languages is not a sufficient basis for establishing universals of phonological development because the languages do not constitute a representative sample. Finding differences between children acquiring one or more languages is not evidence for the dominance of the particularist spirit because the sample of languages may exaggerate differences that are limited to those languages. Great care is needed to craft a method of comparing phonological development across languages in order to determine the balance between unifying forces and particularist spirits.

We present two studies of variation in the production of initial consonants by children acquiring six Mayan languages. The use of historically related languages minimizes the phonetic, phonotactic and phonological differences between the adult languages as well as cultural differences in child rearing and child-directed speech. These controls are instrumental to understanding individual variations in the children's developing phonologies. Study One uses a qualitative method to assess the similarities and differences in the children's initial consonant inventories. This study shows that Mayan children share a common core of early consonants, but nevertheless exhibit language-specific departures from the core. Study Two presents a statistical analysis of the variation in the children's consonant production. We find that although individual children vary in the consonants they produce, their range of variation differs from that of children acquiring the other languages. The two studies demonstrate the effect of the adult phonologies on the children's phonological development and argue against purely individualist and universalist accounts.

In the following section of the paper we describe the Mayan consonant inventories and their phonetic realizations. The third section of the paper describes the children and the method we used to record and analyze their consonant productions. We present Study One in the fourth section of the paper and Study Two in the fifth section. We conclude with a discussion of the findings.

2. The Mayan language family

The Mayan language family contains 30 languages which are currently spoken in Mexico, Guatemala, Belize and Honduras (England, 1994) with a historical divergence of approximately four thousand years (Kaufman, 1990). We analyzed acquisition data from children acquiring six Mayan languages: Teenek (Wastekan), Yucatec (Yukatekan), Ch'ol (Ch'olan), Q'anjob'al (Q'anjob'alan), Mam (Mamean) and K'iche' (K'iche'an). Fig. 1 shows the geographic distribution of these six Mayan languages.

Teenek is the autonym for the Wastek language. It is spoken in the states of San Luis Potosí and Veracruz in northeastern Mexico. Teenek was heavily influenced by the nearby Nahuatl languages, and is the only Mayan language that has the phonemes /kw, k'w and θ/. Varieties of Yucatec are spoken today across the Yucatan peninsula in Mexico. Yucatec has a long history of contact with the Ch'olan languages. Yucatec and Ch'ol share the innovated voiceless bilabial ejective /p'/ as well as the loss of the uvular stops /q and q'/. Ch'ol is spoken along the northern border of the state of Chiapas in southern Mexico. Q'anjob'al is spoken in the northwestern region of Guatemala in the department of Huehuetenango. Mam is spoken to the south of the Q'anjob'al region in the western border region of Guatemala. K'iche' is spoken to the east of Mam in the western highland region of Guatemala. While Mam and K'iche' are closely related historically, Mam has had intensive contact with the Q'anjob'alan languages. Q'anjob'al and Mam innovated the retroflex

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