Phonetic and Phonological Variation in Northern and Southern Mam: Dialects of a Mayan Language

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Pinkerton (1986) found allophonic dialectic variation in Mayan languages in the manifestation of glottalic stops through the use of ejectives, voiced implosives, and voiceless implosives in bilabial, alveolar, and uvular places of articulation but consistent use of ejectives at the velar place of articulation. Mam, a Mayan language spoken in Guatemala and Mexico, shows a relatively high degree of phonological variation due to regional innovation and historical isolation of dialects (Jiménez, 2000), but no acoustic comparison of the dialects exists. England (1983) classifies three dialect branches of Mam: Northern Mam, Southern Mam, and Western Mam, which are mutually unintelligible due mainly to lexical variation. This paper presents a comparative analysis of phonetic differences based on Voice Onset Time (VOT), fundamental frequency (f0), vowel amplitude rise time (RT), and allophonic variation between the Northern Mam dialect based on previous literature (England, 1983; Russell, 1997) and the Southern Mam dialect based on a novel acoustic analysis presented here of data from eight native speakers of Southern Mam from San Marcos, Guatemala.

A comparison of the data shows a greater degree of allophonic variation in the glottalic stop series in Southern Mam when compared to Northern Mam. Northern Mam is claimed to have bilabial implosives, allophonic alternation between alveolar ejectives and implosives, velar ejectives, and uvular implosives (England, 1983). In contrast, speakers of Southern Mam exhibit inter- and intra- speaker allophonic variation of ejectives and implosives at both the bilabial and uvular places of articulation.

Plain stops in Southern Mam are produced with longer VOT, particularly in plain velar and uvular stops, which are produced with frication following the release. Southern Mam plain velar stops are on average 49.9ms longer than those in Northern Mam, while plain uvular stops are 34.3ms longer (based on Russell, 1997). Velar ejectives in Southern Mam are on average 65.2ms longer than those in Northern Mam.

Plain stops in Northern Mam have a higher f0 at the onset of vowels than in Southern Mam. Both dialects exhibit a lower f0 between glottalic stops, ejectives and implosives, when compared to plain stops which indicates that f0 is an acoustic cue used in both dialects to distinguish glottalic stops from plain stops but not ejectives from implosives. The RT of vowels following glottalic stops in Southern Mam is generally faster than in plain stops. The opposite is found in Northern Mam, with a slower RT following glottalic stops. Differences in RT between plain and glottalic stops are not consistently statistically significant in either dialect, indicating that RT is not an acoustic cue used to distinguish plain from glottalic stops.

These results demonstrate that the phonetic manifestation of plain and ejective stops in Southern Mam is characterized by longer VOTs and faster RT than in Northern Mam but similar f0 patterns. Southern Mam exhibits a greater degree of allophonic variability in the production of glottalic stops than Northern Mam. I claim that this variation is due to differences in the implementation of the [constricted glottis] feature.

Selected References

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