

Phonation as a Cue to Tone Splits in Central Mashan Hmong

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Abstract

Mashan Hmong belongs to the Chuan–Qian–Dian branch of the Hmong–Mien language family and is spoken mainly in southern Guizhou and northwestern Guangxi. The Central variety spoken in Zongdi town, Ziyun County, is notable for its exceptionally complex tonal system, with previous studies reporting between nine and thirteen tones across different villages. Most existing work, however, remains at the level of traditional phonetic description, and the acoustic cues that distinguish these numerous tones – particularly the role of phonation type – are not yet well understood. This study investigates how phonation-type cues underpin complex tone splits in Central Mashan Miao, asking which acoustic parameters systematically distinguish tonal categories across multiple field sites.

Controlled speech production data were collected from four male speakers representing three field sites: Shanjiao village (11 tones), Zongdi village (13 tones, including the Jiaotuo group), and Hongyan village (13 tones). Acoustic parameters, including fundamental frequency, spectral tilt measures (H1–H2, H1–A1), and cepstral peak prominence (CPP), were extracted using VoiceSauce at three temporal points within each vowel. One-way ANOVAs were used to assess whether these phonation measures differentiate tonal categories within and across speakers.

Results show that all three phonation measures significantly distinguish tonal categories for all four speakers, confirming that phonation is an integral dimension of tonal contrast in this variety. A key finding is a two-way dissociation in the Shanjiao data: the tone split pair T13/T24 is differentiated primarily by breathiness (elevated H1–H2 and H1–A1 on T13), while the pair T23/T34 is differentiated primarily by phonation periodicity (lower CPP on T34). Cross-speaker comparison further reveals that CPP is the most consistent phonatory differentiator across all three sites, whereas the contribution of H1–A1 and the temporal locus of phonatory contrasts vary by location.

These findings demonstrate that phonation is a systematic and phonologically active cue to tone splits in Central Mashan Miao, rather than a mere phonetic correlate. More broadly, they position this variety as a typologically significant case for understanding how diachronic tone splits give rise to stable synchronic phonatory contrasts in Hmong–Mien languages and tone systems with large inventories. The study thus contributes empirical evidence to ongoing discussions of the interface between phonation, tone, and tonogenesis in languages of southern China.

Keywords: Mashan Homong, Hmong–Mien, tone production, phonation type, acoustic analysis, tone split