

Morpho-syntactic and prosodic effects on Taiwanese Min sandhi and base tones
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The alternations between the six sandhi tones and seven base (juncture) tones in Taiwanese Min are linked by six tone sandhi rules that form chain-shift relationships, 13, 55 → 33 → 31 → 51 → 55, and 5 → 3 → 5. Within the domains of tone sandhi groups, domain-final syllables surface with base tones, whereas non-final syllables surface with sandhi tones. Even after decades of studies from morpho-syntactic and prosodic aspects, the natural of tone sandhi group remained unclear. This study investigated the alternations between sandhi and base tones with adult spontaneous speech corpus, TaiMinSS (www.taimin.tw) to explore the morphology-syntactic effect, including modification marker and final particles, and prosodic hierarchical effect on sandhi-base tone alternations. Moreover, data driven decision tree models were used to investigate the dominance rankings between dialect region, gender, age, morpheme identities, prosodic hierarchy, underlying phonemic tone identity and duration on sandhi and base tone alternations. Results showed that there were more base tones than sandhi tones before modification marker and final particles. Before low level weak syllable and word boundaries, there were more sandhi tones than base tones. However, before high level strong intermediate phrase (ip) and intonation phrase (IP) boundaries, there were more base tones than sandhi tones (Figure 1). Results of decision tree models found that prosodic hierarchy was the most dominant factor in determining the tonal alternations, followed by tonal identity and finally duration (Figure 2). The percentages of base tones gradually increased from syllable and word domain-final positions to short tones 13 and 33 at ip and IP domain final positions, and finally to tones 55, 51 and 33 at ip and IP domain-final positions. The prosodic hierarchical, phonemic tone identity, and duration effects on sandhi and base tone alternations, may explain why previous wug tests on the productivity of Taiwanese tone sandhi chains showed that native speakers had difficulties applying tone sandhi rules to isolated nonce words.

