

## The Effect of Morpho-syntax and Prosodic Boundary on Taiwanese Min Juncture Tones

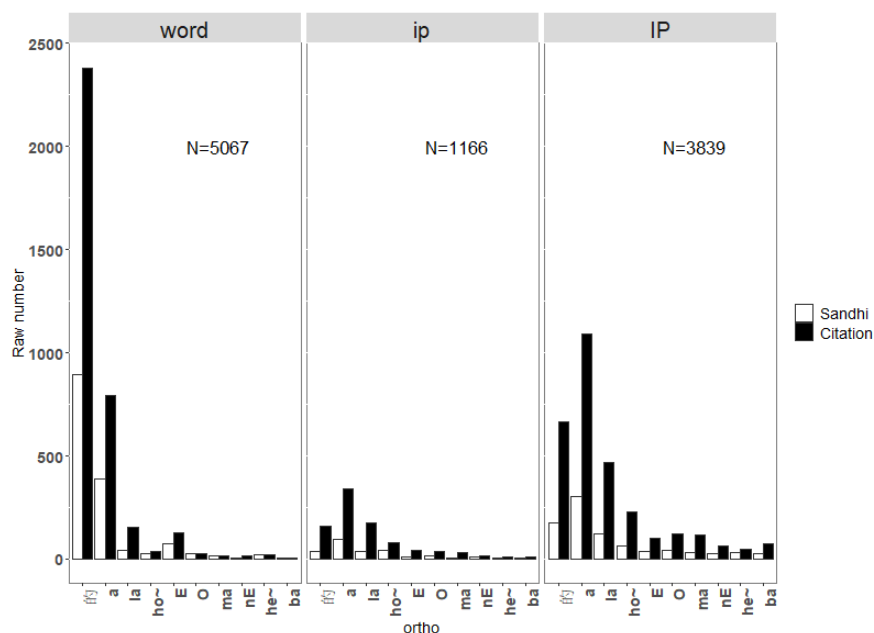
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Morpho-syntax and prosody interface to determine juncture tone production in Taiwanese Min, a language known for its chain-shift tone sandhi rules, 55, 13 → 33 → 31 → 53 → 55 and 5 → 3 → 5. Within the domain of a tone sandhi group (TSG), the final syllable carries juncture tone, whereas the non-final syllables carry sandhi tones. According to the tone sandhi rules, in /pɛʔ5 tsai31 lɔ53/ [pɛʔ3 tsai31 lɔ53] “cabbage stew,” 白菜滷, the syllable /tsai31/ [tsai53] surfaces with a sandhi tone, whereas the syllable /lɔ53/ [lɔ53] surfaces with a juncture tone. However, in /lɔ53 pɛʔ5 tsai31/ [lɔ55 pɛʔ3 tsai31] “stew cabbage,” 滷白菜, the syllables /tsai31/ and /lɔ53/ surface with juncture tone [tsai31] and sandhi tone [lɔ55], respectively. The surface tone values may change according to the syllable positions in a TSG domain. To date, prosodic nature of TSG has not been investigated fully. It has been proposed that the TSG domain is determined by syntactic domain and that a juncture tone occurs before the domain of an XP that acts as an argument or adjunct [1, 2, 3, 4]. Furthermore, only juncture tones were found to occur before the morpho-syntactic attribute modification marker “的” [ɛ] which carries a neutral tone (0) in a nominal phrase [XP ɛ YP]. For example, by placing the modification marker, [ɛ0], after the XP noun phrase /hai53 bī55/ “seashore,” the noun phrase /hai53 bī55 ɛ 0/ modifies the following YP noun phrase / ts<sup>h</sup>u 31/ “house” as in /hai53 bī55 ɛ0 ts<sup>h</sup>u 31/ [hai55 bī55 ɛ0 ts<sup>h</sup>u31] “beach house.” The syllable /bī55/ [bī55] before the modification marker, [ɛ0], carries juncture tone.

Aside from morpho-syntax, prosodic boundary was also found to affect juncture tone production [5]. There were more juncture tones than sandhi tones before high level intermediate phrase (ip) and intonation phrase (IP) boundaries. On the contrary, there were fewer juncture tones than sandhi tones before syllable and word boundaries.

This study investigates the effects of prosodic boundaries, including word, ip and IP, on the juncture tone production, along with the effect of morpho identity, including modification marker /ɛ0/, and final particles /a0, la0, hō, ɛ0, o0, ma0, nɛ0, hē0, ba0/ with frequencies over 100, on the occurrence of juncture tones. The juncture to sandhi ratios of penultimate syllables preceding modification marker or final particle before word, ip and IP boundaries ( \_\_\_/a0, la0, hō, ɛ0, o0, ma0, nɛ0, hē0, ba0/+ word, ip and IP) were investigated. Adult spontaneous corpus (TaiMinSS, [www.taimin.tw](http://www.taimin.tw)) was used. TaiMinSS contains 30 monologues elicited from 40 speakers, female and male, of six dialect regions. The speakers were either above 40 years of age, or under 30 years of age. Monologues were transcribed using Praat at an utterance tier, an orthography tier with Chinese characters, a word tier with SAMPA symbols parsed for each word, an underlying tone tier, a surface tone tier with actual tones produced, a syllable tier, a segment tier reflecting the actual segmental pronunciations, a linguistic tier and a miscellaneous tier. Results showed that, first, there were more juncture tones than sandhi tones before the modification marker and before final neutral tones as well (Figure 1). Second, results of linear mixed effect regression models (morphemes × prosodic boundaries) with speakers as a random factor showed that juncture to sandhi tone ratios (J/S) were significantly lower before word boundary than before ip and IP boundaries. The J/S ratios before the modification marker /ɛ0/ were significantly higher than those preceding final particles at word, ip or IP domain-final positions. Third, the J/S ratios were significantly lower before word boundary than before ip or IP boundaries. It is proposed that neutral tone, morpheme identity and prosodic boundary have profound impacts on J/S ratios of penultimate syllables.



**Fig.1** The numbers of juncture (citation) tones and sandhi tones at penultimate positions preceding modification marker “的” /ε0/ and final particles /a0, la0, hō, ε0, o0, ma0, nε0, hē0, ba0/ at word, ip and IP domain-final positions.

## References

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