

Sentential Modification and Theories of Tone Three Sandhi

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Purpose: The purpose of this study is to critically examine the power of prediction for two competing analyses on the Tone 3 Sandhi (T3S) phenomena in Mandarin Chinese (MC), namely Chen's (2000) Minimal Rhythmic Units (MRU) analysis and Duanmu's (2007) Metrical Feet (MF) analysis.

Background: The general T3S rule in MC is in (1). However, the application of T3S is sometimes optional due to different prosodic structures (Beattie, 1985; Cheng, 1987; Shih, 1997) and tree structures (Cheng, 1970, 1973; Kaisse, 1985; Liu, 1980). In addition, the T3S pattern of sentences with a sentential modification, as shown in (2), has not been previously discussed.

Predictions: By assuming that there is an intonation boundary between these two third-tone syllables (i.e. *wǒ* 'I' and *hěn* 'very' in (2)), Chen's MRU analysis predicts that T3S must not apply and therefore *wǒ* remains its citation tone (i.e. Tone 3). Conversely, by assuming that *wǒ* and *hěn* are syntactically not adjacent and *wǒ* receives the stress, Duanmu's MF analysis predicts that T3S can optionally apply for *wǒ*.

Method: Thirty-eight native speakers of MC read aloud ten sentences such as (2) intermixed with 50 sentences for the purpose of other studies. For all the critical items, the subject of the main clause was always a Tone 3 syllable modified by a relative clause. The syllable next to the subject was always *hěn* 'very', which was another Tone 3 syllable. One rater judged the tone of all the critical words (e.g. *wǒ* in (2)) produced by all the informants. An additional rater judged 15% of the total data to establish the inter-rater reliability.

Hypothesis: If native speakers of MC systematically produced Tone 3 for the critical words (e.g. *wǒ* in (2)), Chen's proposal was supported; instead, if those speakers optionally produced Tone 3 and Tone 2 for the critical words, Duanmu's analysis was supported.

Results: The result of inter-rater reliability, using Cohen's kappa, was 1.000. The robust agreement between two raters was not surprising because non-application of the sandhi processes could be easily detected by native speakers of MC (Zhang & Lai, 2010).

The results are shown in **Table 1**. Native speakers of MC consistently produced those critical words with Tone 3. The results lent support to Chen's MRU analysis.

Discussion: One crucial difference between Chen's analysis and Duanmu's analysis was that Chen specified contexts where T3S must not apply while this 'must-not-apply' condition was absent in Duanmu's analysis. Therefore, the merit for Chen's analysis is highlighted. Additionally, together with Liu (2015), it is shown that, within Duanmu's framework, the potential 'must-not-apply' conditions turned out to fail to accommodate the empirical data.

Examples:

(1) 3 → 2 / __ 3 (Tone 3 becomes Tone 2 when it is followed by another Tone 3.)

(2) IP[DP[Chī-wán xiāoyè de **wǒ**] VP[**hěn** bǎo]]
eat-finish night-snack relative-clause-marker I very full
'After eating the night snack, I am full.'

Table 1

	Tones	Tone 2	Tone 3
Sentence Type			
<i>Sentential Modifications</i> (n = 378) ¹		0.3% (1)	99.7 % (377)

¹ Due to technical problems, two productions were missing.

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