

## Yixing Chinese Tone Sandhi: Phonological Explanations and Syntactic Applications

*J. Joseph Perry, University of Cambridge*

Certain Wu Chinese dialects such as those of Changzhou (Chao 1970) and Wuxi (Chan and Ren 1989), are of interest because they display two kinds of tone sandhi simultaneously, labelled ‘pattern substitution’ and ‘pattern extension’ by Chan and Ren. Chan and Ren describe Wuxi tone sandhi in some detail, but their analysis is problematic in two respects: first, their analysis of ‘pattern extension’ involves ‘edge-in’ association, where edgemost members of a tonal pattern associate to both left and right edges, and other members to intervening syllables - but this pattern is not reliably attested elsewhere, and it would be desirable to find an analysis with mechanisms found in other languages. Secondly, they do not provide a general characterisation of the domains in which these processes occur. I present an account of tone sandhi in the neighbouring Yixing variety which addresses both of these issues.

In ‘pattern extension’ tone sandhi (exemplified by Shanghainese – see eg. Selkirk and Shen 1990), the tonal specifications of all syllables but the initial one in a certain domain are deleted, and the pitch of the following syllables is determined by the specification of the initial element. Though Yixing shows similar behaviour to Wuxi in that a tonal specification may be distinguished from another at either edge of the extension domain (consider *ni<sup>11</sup> zə<sup>11</sup> bən<sup>11</sup> fy<sup>11</sup>* ‘twenty books (two ten CLS book)’ vs. *dʒu<sup>51</sup> zə<sup>11</sup> bən<sup>11</sup> fy<sup>11</sup>* ‘ninety books’ vs. *sɿ<sup>51</sup> zə<sup>11</sup> bən<sup>11</sup> fy<sup>13</sup>* ‘forty books’ – here the extension domain constitutes the entire phrase), Chan and Ren’s analysis is untenable, as it predicts that tonal contours on large domains should always be commensurate with tonal contours on isolated syllables: for example, a pattern HHH should produce both high level tones on single syllables and a series of them in larger domains. We do not find this (consider *sa<sup>55</sup>* ‘three’ vs. *sa<sup>54</sup> zə<sup>43</sup> bən<sup>32</sup> fy<sup>21</sup>* ‘thirty books’). Rather we must say that a tonal specification includes both tonal elements associating with TBUs and lexically specified boundary tones (which are also attested in eg. Osaka Japanese [Pierrehumbert and Beckman 1988]). This allows us to avoid resorting to the problematic mechanism of edge-in association. There is a final degree of freedom – whether the tones in question are pre-associated with the initial syllable or not. We find eight underlying tonal categories, each corresponding to a combination of a Middle Chinese tone class and register.

### (1) Yixing tonal pattern inventory (by Middle Chinese equivalent)

	I	II	III	IV
Upper	H L%	HL L%	HL H%	<u>H</u> L%
Lower	LH H%	LH L%	L L%	<u>LH</u> L%

Nb. Underlining here represents underlyingly unassociated tones.

In ‘pattern substitution’ tone sandhi (more typical of Southern Wu and Min Chinese – see eg. Chen 1987), the tonal specification of a syllable is altered if it is followed by another syllable in the sandhi domain. The change is a categorial shift from one tonal pattern to another. For instance, pattern substitution in Yixing may replace a falling tone with a rising one, or vice-versa.

### (2) Yixing substituted tones

	I	II	III	IV
Upper	H L%	H H%	LH H%	<u>LH</u> L%
Lower	<u>LH</u> L%	LH L%	L H%	<u>HL</u> L%

Yixing pattern substitution feeds pattern extension, meaning that the extended pattern is frequently conditioned not by the lexical tone specification of the initial element but the substituted sandhi tone. For example, consider the word *gwae<sup>513</sup>* ‘expensive’, which has the

underlying specification (HL H%). In the phrase *gwae*<sup>21</sup> *lao*<sup>45</sup> *fy*<sup>55</sup> ‘expensive books’, pattern substitution is triggered by an attributive marker *lao*, substituting the pattern (LH H%), which then spreads across the extension domain (here, the whole phrase). We also find that a pattern substitution domain must always lie within a pattern extension domain, meaning that we see pattern extension without pattern substitution (as can be seen in the examples with numerals above), but never the reverse. To capture this, we can identify the substitution domain with the phonological word but the extension domain with the phonological phrase. The examples above would therefore be analysed as follows:

- (3) *Yixing prosodic structure in a) numeral constructions and b) attributive constructions*  
 a)  $(\varphi)(\omega \text{ s}i) (\omega \text{ z}\partial)(\omega \text{ b}\partial n)(\omega \text{ f}y)$  ‘forty books’  
 b)  $a(\varphi (\omega \text{ gwae } \text{lao})(\omega \text{ f}y))$  ‘expensive books’

Analysing these domains as prosodic constituents gives us a useful tool with which to probe syntactic structure. I give two examples of such applications: First, there is evidence that classifiers may occur in more than one syntactic position. Noun classifiers occur in conjunction with both numerals and determiners. However, the tone patterns of these constructions differs: in the former, the noun forms part of the same phonological phrase as the numeral and classifier (eg.  $(\varphi \text{ i}^{55} \text{ b}\partial n^{11} \text{ f}y^{11})$  ‘one book’) In the latter, however, the noun retains its lexical tone, lying outside the phonological phrase containing the determiner (eg.  $(\varphi \text{ i}^{55} \text{ b}\partial n^{11}) (\varphi \text{ f}y^{13})$  ‘a book’). As for the classifier, it lies in the same phonological phrase as the noun in numeral constructions and outside it in determiner constructions, suggesting it occupies a different syntactic position in each.

We also find evidence of syntactic ellipsis in constructions with certain numerals, specifically numerals between multiples of ten. Consider  $sa^{55} \text{ z}\partial^{11} \text{ j}i^{55} \text{ b}\partial n^{32} \text{ f}y^{21}$  ‘thirty-one books (three ten one CLS book)’. Here we have two phonological phrases  $(\varphi \text{ sa}^{55} \text{ z}\partial^{11}) (\varphi \text{ j}i^{55} \text{ b}\partial n^{32} \text{ f}y^{21})$ . Note that in other constructions the expression  $sa^{HL\%} \text{ z}\partial$  ‘thirty’ phrases with the noun, but is separate here – the most convincing explanation is that we underlyingly have a coordinated expression  $(\varphi \text{ sa}^{55} \text{ z}\partial^{11} \text{ b}\partial n \text{ f}y) (\varphi \text{ j}i^{55} \text{ b}\partial n^{32} \text{ f}y^{21})$  ‘thirty books [and] one book’: at the surface the noun and classifier are elided. These examples show that a clear delineation of the relevant domains in phonological terms have immediate implications for the syntactic analysis of various constructions.

## References

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