

A Diachronic Perspective on Left-dominant and Right-dominant Tone Sandhi in Northern Wu Chinese: Evidence from Xiangshan

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Northern Wu Chinese is renowned for its two distinct tone sandhi systems: left-dominant sandhi (LDS) and right-dominant sandhi (RDS). For example, in Shanghainese [1], LDS manifests as left-to-right tone spreading, where the initial syllable's tone is spread across the whole domain. RDS, in contrast, preserves the tone of the final syllable while reducing the preceding tones. LDS typically occurs in highly lexicalised compounds, whereas RDS is more common in loosely bound syntactic phrases. These two systems—seemingly opposite in their tonal strategies—pose fundamental questions about their origin, function, and evolution. While existing theories attribute these behaviours to stress, the lack of consistent acoustic correlates in Chinese weakens this explanation. This study presents two alternative diachronic accounts for the co-existence of LDS and RDS in Northern Wu.

The Xiangshan dialect, which is spoken in Xiangshan, Zhejiang province in China, has six citation tones: HH, HL, LHL, LH, Hq, and LHq. The historical *ping* and *shang* categories have merged into one synchronic tone in each of the two registers (

Table 1). This study examines the disyllabic tone sandhi patterns in Adjective-Noun compounds and phrases in Xiangshan Chinese. A total of 287 tokens with non-checked tone combinations were collected from eight native Xiangshan speakers (mean age: 50, 4 female). F_0 patterns were identified using k-means clustering and auditory categorisation.

Despite mergers in the citation tone system, disyllabic tone sandhi retain historical distinctions of the initial tone. Adjective-Noun compounds and phrases beginning with a *yingping* tone mostly exhibit a falling (HHML) or a rising (MMMH) sandhi contour, while those starting with a *yinshang* tone favour a level (HHHH) or a rising-falling (MHHL) sandhi (Figure 1). The choice between the two possible outputs was found to be mostly speaker-specific. Similar patterns were found in Low-register-initial tokens: falling (LHML) or rising (LLLH) contours only exist in *yangping*-initial tokens, while *yangshang*-initial ones show level (LLHH) or rising-falling (LLHL) contours (Figure 2). Crucially, the second syllable also influences tonal outcomes in *yangping*-initial disyllables (Figure 3), where level sandhi occurs when the second syllable is HH, rising when LHL or LH, and rising-falling sandhi when HL. This interaction suggests a complex interplay between the left-dominant and right-dominant mechanisms with alternative historical accounts possible.

Diachronic account 1: Left-dominance-originated tone sandhi. Lexical tone sandhi patterns were initially derived via left-to-right tone spreading, creating two distinctive sets of sandhi patterns for *ping*- and *shang*-initial tokens. The developmental paths for disyllabic sandhi and monosyllabic tones have diverged ever since, with monosyllabic tones undergoing tone mergers, and disyllabic sandhi fossilised. However, this account cannot explain the right-dominant elements in the *yangping*-initial disyllabic lexical sandhi, as the non-initial tones should have been completely neutralised under this account.

Diachronic account 2: Change from Right-dominance to Left-dominance. Following Li's hypothesis [2], RDS historically preceded LDS. RDS, as a phonetically-driven process motivated by final lengthening, enables full tonal preservation in phrase-final position, and develops hand-in-hand with the monosyllabic system, thus always reflecting the up-to-date citation tones. LDS emerged later to mark lexical words as a result of a disyllabification trend which gained ground in Middle Chinese. Initially forming in structures like reduplicated items, where semantic dominance of the initial syllable influenced the phonetic representations, LDS later spread to other lexical constructions to contrast with more loosely connected phrases. The Xiangshan data support this account: the right-dominant elements in the *yangping*-initial sandhi patterns might be historical residuals of RDS. This account also aligns with descriptions of Wu tone sandhi in larger areas, where tone sandhi is rarely purely LDS, but usually

a mixture of RDS and LDS. Specifically, Qian’s proposed four stages of LDS—partial connection, dfferentiation, simplification, and spreading [3]—illustrates a transition from RDS to LDS.

Table 1 Tone system of the Xiangshan dialect.

category \ register	<i>ping</i> ‘level’	<i>shang</i> ‘rising’	<i>qu</i> ‘departing’	<i>ru</i> ‘checked’
<i>yin</i> ‘high’	HH		HL	Hq
<i>yang</i> ‘low’	LHL		LH	LHq

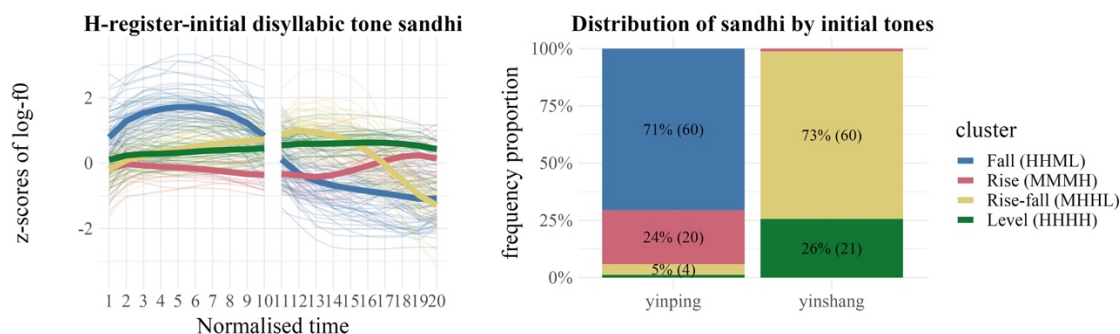


Figure 1 H-register-initial disyllabic tone sandhi patterns (left) and distributions of the patterns by initial tones (right).

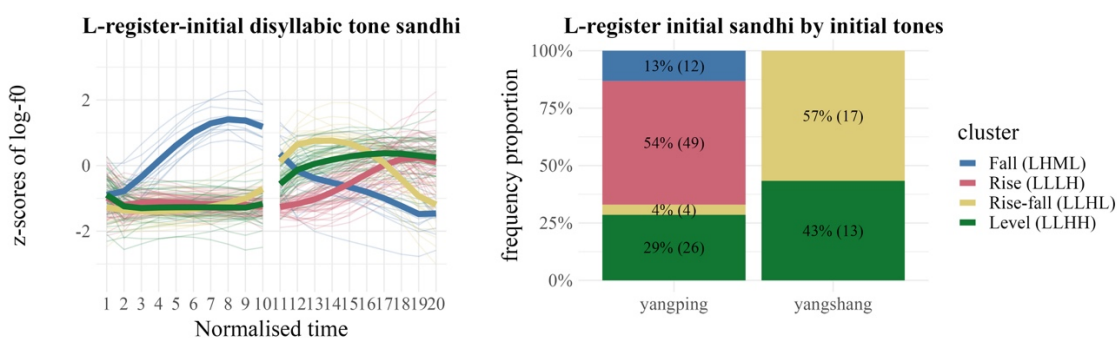


Figure 2 L-register-initial disyllabic tone sandhi patterns (left) and distributions of the patterns by initial tones (right).

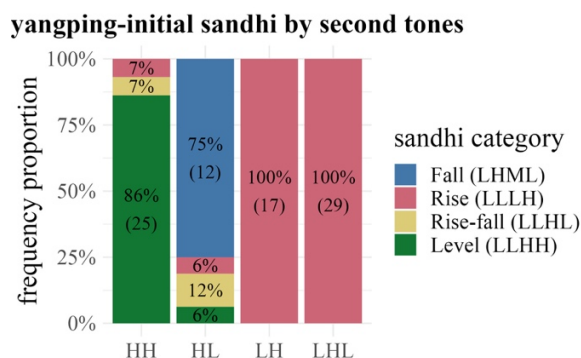


Figure 3 Distribution of yangping-initial sandhi by second tones.

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