

Moraic Footing in Suzhou Chinese: Evidence from Toneless Moras

Yuhong Zhu

The Ohio State University

1 Introduction

Suzhou Chinese, a major dialect of the Northern Wu family, demonstrates complex tone sandhi patterns often referred to as *left dominance* by Chinese phonologists (Chan and Ren 1989; Duanmu 1995; 1999; Chen 2000, Yan and Zhang 2016; Zhang 2007, among others). Furthermore, a closer look at sandhi patterns with an initial monomoraic/light syllable (hereafter: *light-initial sandhi*) reveals aspects that, as I demonstrate, cannot be adequately covered by previous approaches such as Duanmu's metrical foot-based analysis (See Zhu 2020; in prep.). The current study provides additional phonetic data for the light-initial sandhi patterns in Suzhou Chinese, illustrating a context-sensitive pitch alternation that is not present after heavy-initial forms, and has not been attested in other neighboring Northern Wu varieties either. I further show that in line with the revised foot-based analysis of Zhu (in prep.), the pitch alternation arises from phonologically toneless moras. My main claims are:

(1a) Prosodic words with an initial light syllable followed by a heavy syllable are parsed with a left-aligned binary moraic trochee built directly on moras (following Kager 1993): $(\mu^+ \cdot \mu^-) \mu \dots$ (plus/minus stand for foot head/dependent respectively). The third mora in such a sequence remains unfooted in all cases, and cannot host any phonological tone. These light-initial words contrast with heavy-initial ones, which are fully parsed by a binary syllabic foot: $(\mu^+ \mu^+ \cdot \mu^- \mu^-)$.

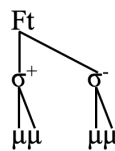
(1b) The pitch patterns of toneless moras are conditioned by immediately adjacent tones due to pitch interpolation. This is reminiscent of the variable realizations of 'neutral tones' in Mandarin (Yip 1980; Duanmu 1999; Lee and Zee 2008), but presents counterevidence to the claim that toneless prosodic constituents always assume a 'default L' in regional dialects of Chinese (see examples in Chen 2000).

(1a) states the structural property of light-initial sandhi in Suzhou: a trochaic foot built directly on moras, partially parsing the second heavy syllable. Meanwhile, heavy-initial disyllables are fully parsed with a disyllabic trochaic foot. The choice of metrical foot is weight-sensitive, driven by a cross-linguistic preference that foot dependents should not be more complex than heads (Head-Dependent Asymmetry; see Dresher and van der Hulst 1998; Iosad 2013; Zhu in prep.). This footing alternation can be represented in the diagrams in (2). Notice that in (2a) the syllables are not being directly dominated by the feet but are on a separate autosegmental plane (violating the Strict Layer Hypothesis; Nespors and Vogel 1986; see Köhnllein and Zhu 2019 for a demonstration of feet directly dominating moras).

(2a) A bimoraic trochee in a light-heavy disyllable



(2b) A disyllabic trochee in a heavy-heavy disyllable



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(1b) states the relationship between the prosodic structure and the surface phonetics: unparsed moras cannot host any phonological tone, and thus function merely as "midpoints" of interpolation between the flanking tonal targets. This directly contrasts with footed moras with phonological tones, which remain stable in pitch regardless of neighboring tonal context.

The paper is structured as follows. In §2 I offer a short review of previous studies on toneless prosodic units and on the relationship between prosodic structure and tonal phenomenon, especially in the context of Chinese languages. §3 presents the empirical data of the study, followed by a foot-based analysis in line with the basic predictions of Zhu (in prep.) in §4. §5 offers some discussion on XXX and concludes the paper.

2 Background

2.1 Tonelessness The discussion of toneless TBUs is often situated in analyses of privative tonal contrasts and toneless morphemes among African languages (Odden 1982; Myers 1998; Yip 2002; Hyman 2000; 2011). Major characteristics of toneless TBU include: transparency to spreading processes, non-active phonological status, two phonologically-distinct [L] tones, variable pitch of the same morpheme. This paper explores the last property of toneless prosodic units: pitch of toneless moras/syllables are best explained as "interpolation" between true tonal targets (Pierrehumbert 1980; Pierrehumbert and Beckman 1988; Myers 1998). I demonstrate the point about variable pitch from interpolation using the Chichewa examples given by Myers (1998).

In Chichewa, non-H-syllables between phonologically H-toned syllables vary in pitch incursion depending on how far apart the two H syllables are. A low pitch dip can be seen when the two H syllables are sufficiently far apart. However, in cases where two H syllables are flanking one non-H syllable there is often no clear dip between them – a phenomenon Myers termed "peak merger". Myers (1998) thus takes such "nonlinear transition" between the two H targets as evidence for tonal privativity in Chichewa: only H tones are phonological; all non-H syllables are phonologically toneless and only carry transitional pitch between H targets.

The bulk of interest on toneless prosodic units among Chinese languages is in the "neutral tones" commonly observed in Mandarin Chinese (Li 2003; Lee and Zee 2008; Y. Chen 2013). For instance, Lee and Zee (2008) measure the variable pitch realizations of neutral-toned grammatical items (e.g. *zi*) and lexical ones in Beijing Mandarin. Depending on the surrounding tonal context, Lee and Zee characterized the neutral tone realization as four main types: high falling, mid falling, low falling and mid level. Meanwhile, tonelessness in regional dialects of Chinese receives relatively less attention. A few cases are worth noting: Shanghai is often claimed to have toneless syllables due to a tone deletion process (Duanmu 1995; 1999; M. Y. Chen 2000). The toneless syllables in Shanghai (Northern Wu) either inherits tones from the leftmost syllable (when it is the second syllable in a prosodic word; cf. *left dominance*), or remain a L "default tone" on the surface. A detailed phonological account of Zhenhai tone sandhi by Rose (1990) also posits unstressed and toneless syllables. They assume a "default L" in initial position, and can also surface phonetically as mid falls [31] as part of an alternating stress pattern (Yip 1995; Li 2003).

One noticeable difference between recent studies on neutral tones in Mandarin Chinese and in other regional varieties of Chinese is that while neutral tones in Mandarin are considered to have variable pitch realizations depending on their tonal context, toneless syllables in other regional varieties are often assumed to only take "default L"/"boundary L", or take phonological tones from adjacent syllables. Although pitch interpolation is noted as a common phenomenon in Chen (2000: 298), very little variable pitch data of these proposed toneless syllables has been obtained (other than being invariably low at prosodic boundaries). The current study aims to bridge this gap by providing an illustration of pitch alternation led by interpolation in Suzhou Chinese, a Northern Wu variety. Crucially, I show that proposed toneless *moras* vary in pitch based on surrounding phonological tones, which appears rather similar to the treatment of neutral tones in Mandarin.

2.2 Left/Right dominance and tone sandhi Position-sensitive effects often termed *left/right dominance* are widely observed in the tone sandhi patterns across different Chinese languages. Below I give one illustrative example of left-dominance in Shanghai Wu, a representative member of Northern Wu Chinese: (for a comprehensive survey, see Chen 2000)

(3)	Left-dominant tone sandhi in Shanghai Wu		
	Segment	Tone letter	Gloss
	[ei]	[42]	fresh
	[ŋ]	[24]	fish
	[ei.ŋ]	[4.2]	fresh fish

The above process is observed in virtually all nominal compounds in Shanghai, where tones of the first morpheme is evenly distributed across the first two syllables. Analyzed in autosegmental tonal terms, the process can be expressed as:

$$(4) \quad /HL/ + /LH/ \rightarrow [H.L]^1$$

There have been different phonological analyses trying to account for left-dominant tone sandhi in a variety of Northern Wu dialects. Duanmu (1995; 1999) argues for a foot-based analysis where a left-headed disyllabic foot determines strong/weak syllables in Shanghai Wu. The leftmost strong syllable preserves all its tones and redistributes them evenly across the foot domain, whereas the non-initial weak syllable deletes all tones. Noticeably, he has based his account on purely *structural* prominence relationship as "metrical systems may exist ... in which phonetic stress is not obvious". Yan and Zhang (2016) have conducted a nonce word production experiment to investigate if left-dominant tone sandhi in Wuxi Wu is productive to begin with. They receive mixed results where phonetically more natural processes (e.g. ones where the sandhi tones are closer to the base tones; ones only involving redistribution of tones) were more productive in the nonce word test than phonetically opaque processes were. They have therefore concluded that tone sandhi patterns in Wuxi are lexically stored, among which the phonetically more natural tonal redistribution process is productive in nonce words.

In line with Zhu (2020; In prep.), this paper follows the tenets of the foot-based approach, although I do not intend to favor either theoretical model as the data I offer present unique challenges to both of them. In Suzhou (Northern Wu), a set of tone sandhi patterns where the initial morpheme belongs to the historically "checked tone" category exhibit alternations based on what the *non-initial* morpheme tone is. As checked tones are realized as light open syllables in speech in contemporary Suzhou, I refer to the above sandhi patterns as *light-initial sandhi*. (5) demonstrates the alternation (subscript moras stand for syllable weight).

$$(5) \quad \begin{array}{l} \text{a. } /H/_\mu + /HH/_{\mu\mu} \rightarrow [H_\mu.L_{\mu\mu}] \\ \text{b. } /H/_\mu + /HL/_{\mu\mu} \rightarrow [H_\mu.H_\mu L_\mu] \\ \text{c. } /LH/_{\mu\mu} + /HH/_{\mu\mu} \rightarrow [L_{\mu\mu}.H_{\mu\mu}] \\ \text{d. } /LH/_{\mu\mu} + /HL/_{\mu\mu} \rightarrow [L_{\mu\mu}.H_{\mu\mu}] \end{array}$$

(5a, b) demonstrate the alternation of surface sandhi conditioned by the lexical tones of the second morpheme. This alternation is not seen in heavy-initial sandhi patterns, listed for comparison in (5c, d). This alternation is neither immediately explainable by the traditional metrical foot analysis (where only initial syllables were predicted to be strong), nor "transparent" enough to be learned as a potentially productive rule (as Yan and Zhang 2016 would predict). A crucial characteristic of light-initial sandhi is that the third and last mora of the light-heavy sequence can never be H in phrase-final positions: $[H_\mu.H_\mu L_\mu]$ but $*[H_\mu.H_{\mu\mu}]$ (cf. $[L_{\mu\mu}.H_{\mu\mu}]$ in 5c,d). Based on the consistent distribution of third mora L tone in light-initial sandhi, Zhu (in prep.) proposes a weight-sensitive foot alternation between disyllabic trochees and bimoraic trochees in Suzhou, with the bimoraic foot associated with light-initial patterns. This is linearly represented in (6) (see 2 for comparison)

$$(6) \quad \begin{array}{l} \text{a. Light-heavy: } (\mu^+.\mu^-)\mu \\ \text{b. Heavy-heavy: } (\sigma^+.\sigma^-) \end{array}$$

¹ Note from the data it is not entirely clear whether the process should be analyzed as initial morpheme tone redistribution or both morphemes preserving its first autosegmental tone. A more complete paradigm of tonal combination demonstrates that the first morpheme tone is indeed being preserved, but is omitted here for exposition reasons.

In (6a), a bimoraic foot only dominates two out of the three moras of a disyllable, leaving the last mora unparsed. Following the interaction between tone and metrical prominence put forward by de Lacy (2002), I propose that the unparsed mora cannot host any phonological tone, and is thus invariably L-toned in phrase-final positions on the surface. There is one extra piece of structural evidence for the existence of bimoraic feet: if the light-heavy disyllable were to be parsed by a disyllabic trochee, the head constituent would have been lighter in quantity than the dependent, which is shown to be cross-linguistically dispreferred (Dresher and van der Hulst 1998; Iosad 2013).

The current study provides additional phonetic evidence for the existence of bimoraic feet in Zhu (in prep.): in the previous phonological account, Zhu (in prep.) only shows an invariable low pitch in phrase final positions, supposedly due to tonelessness and a phrase-final L boundary tone. If the third mora in a light-heavy disyllabic sequence is indeed toneless, we would expect the pitch of said mora to vary in phrase non-final position depending on its surrounding tonal context, similar to "neutral tones" in Mandarin. This is a prediction this study sets out to test.

3 The data

3.1 Methods The material for the current study consists of trisyllabic and quadrisyllabic noun phrases in Suzhou Wu, with light or heavy syllables being in the initial position. Tones following the initial syllable/morpheme have been controlled for easier comparison across light-initial and heavy-initial items. All noun phrases were elicited in the carrier phrase "講__撥我聽" ("Say __ for me") to avoid potential utterance-final effects. Due to travel restrictions caused by the pandemic, this study contains relatively few elicited items (four contrastive pairs) from three younger speakers (all male, aged 27, 28 and 30; one being the author). All informants were digitally recorded in a quiet room at a sampling rate of 44100Hz using a Shure SM10A-CN head-worn microphone and a Zoom H4N PRO digital recorder. Participants other than the author had signed a consent form before the recording.

3.2 Phonetic data Below I show pitch patterns of four quadrisyllabic prosodic phrases elicited in carrier sentences. Note that the tone sandhi process among the third and fourth syllables does not immediately concern us here, as they can be adequately accounted for by either of the previous approaches to left-dominant tone sandhi. Here, the last two syllables (especially the third) merely function as tonal contexts directly following the first two syllables. I show the pitch tracks of two pairs of noun phrases: light-heavy disyllables followed by a H or L phonological tone, and heavy-heavy disyllables followed by a H or L phonological tone. The textgrid below shows three levels: (lack of) tones associated with the TBU, moras as the TBU, and segments. The underlying tones represented in slashes //, also referred to as "isolation tones" (cf. Chen 2000), are based on pitch patterns of each morpheme/syllable in isolation. Lastly, hypothesized toneless moras are represented as [Ø], and /T/ stands for *any* lexical tone of specified weight. The two pairs of quadrisyllabic tonal combinations are shown below in Figures 1-4.

Figures 1, 2 stand for the quadrisyllabic combination of the form Light-Heavy-Heavy-Heavy, while Figures 3, 4 stand for the combination of Heavy-Heavy-Heavy-Heavy. Again, the sandhi process in the third and fourth syllables follows basic principles of left dominant tone sandhi of Wu Chinese, which has been adequately accounted for by previous studies (Duanmu 1999; Shi and Jiang 2013; Shi 2013; Zhu 2020, to name a few).

The relevant window of interest is shaded gray in the figures – the two moras in the second heavy syllable, and the immediately following first mora of the third syllable. In Figures 1 and 2, there is an obvious alternation of pitch contour on the second mora of the second syllable (colored red), depending on what the surrounding tonal context is. When this middle mora is surrounded by two H tones, it surfaces as a simple H plateau²; when preceded by a H and followed by a L, however, the middle mora surfaces with a falling pitch. In stark contrast to this is the non-alternating pitch patterns of Figures 3 and 4: regardless of its tonal context (H-μ-H or H-μ-L), the second mora of the second syllable stay as a H level pitch on the surface.

² The pitch tracking in Figures 1 and 3 cuts off in the middle due to the voiceless [k]. There is a robust correlation between onset voicing and tone in contemporary Suzhou such that H-toned morphemes all start with a voiceless onset.

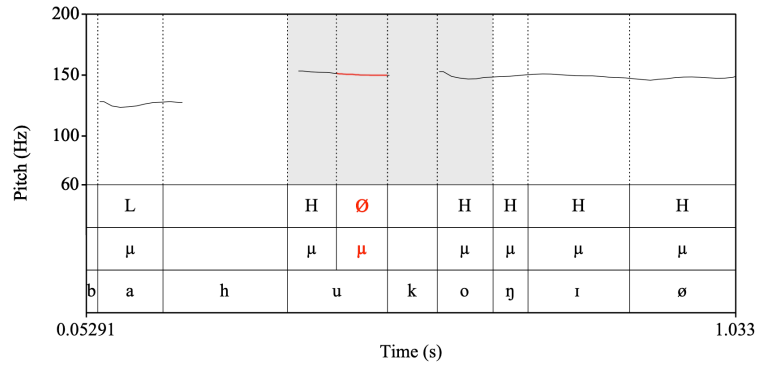


Figure 1. /LH/μ + /T/μμ + /HH/μμ + /T/μμ → [Lμ.HμØμ.Hμμ.Hμμ]. Gloss: [ba.ho:.koŋ.iø] 'white flower park'

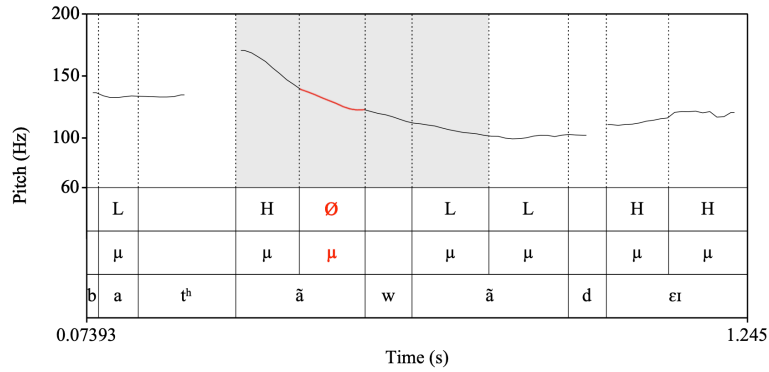


Figure 2. /LH/μ + /T/μμ + /LH/μμ + /T/μμ → [Lμ.HμØμ.Lμμ.Hμμ]. Gloss: [ba.tʰã:.wã:.dɛɪ] 'soybean in white broth'

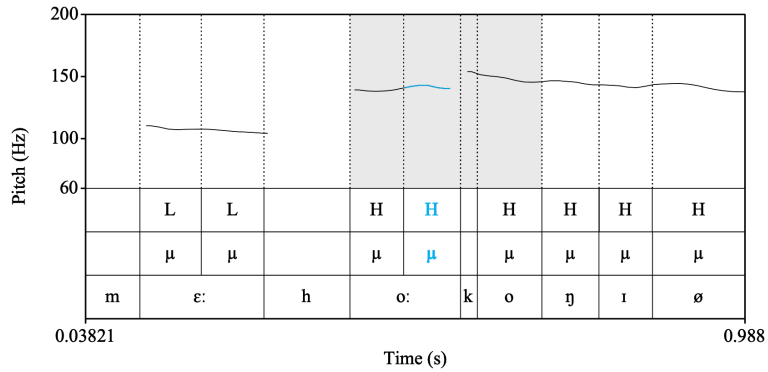


Figure 3. /LH/μμ + /T/μμ + /HH/μμ + /T/μμ = [Lμμ.Hμμ.Hμμ.Hμμ]. Gloss: [mɛ:.ho:.koŋ.iø] 'plum blossom park'

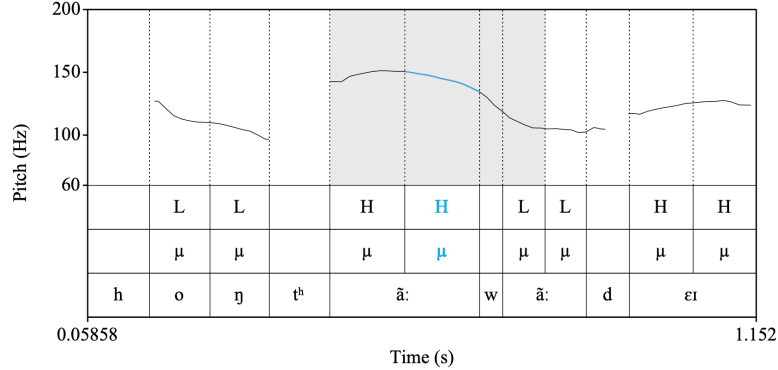


Figure 4. /LH/μμ + /T/μμ + /LH/μμ + /T/μμ = [Lμμ.Hμμ.Lμμ.Hμμ]. Gloss: [hoŋ.tʰã:.wã:.dɛɪ] 'soybean in red broth'

From the pitch contours in Figures 2 and 4, some might argue that both middle moras contain some sort of falling pitch incursion, only differing in curvature. I want to also direct the attention to where a clear falling movement *starts* in these two conditions: in Figure 2, the fall starts at the start of the first mora in the second syllable, similar to /HL/ falling lexical tones elsewhere in Suzhou; in Figure 4, a noticeable fall start towards the end of the second mora in the second syllable, in anticipation of an immediately following phonological L tone. To summarize the empirical data, I argue that in a Light-Heavy disyllable, the very last mora alternates in pitch depending on its immediate (i.e. preceding and following) phonological tones; in a Heavy-Heavy disyllable, such pitch alternation is not observed. The pitch alternation is reiterated in (7).

- (7) a. [H- μ -H]: high level pitch in the middle mora
 b. [H- μ -L]: high falling pitch in the middle mora

This alternation very much resembles the Chichewas "peak merger" pattern documented by Myers (1998), where the assumed "default L"/toneless TBU surface as a high level between two immediately adjacent H phonological tones. Similar effects are also observed in "neutral tones" in Mandarin Chinese (Lee and Zee 2008; Y. Chen 2013). This is most straightforwardly explained by an interpolation effect between tonal targets (Pierrehumbert 1980; Pierrehumbert and Beckman 1988; Ladd 2008): the second mora of the second syllable is not associated to any phonological tone (cf. the metrical structure ($\mu^+ \cdot \mu^-$) μ), and carries a smooth pitch transition between the previous and following mora, both of which are phonologically toned.

Additional empirical support for the toneless third mora comes from another tonal minimal pair condition elicited. In Figures 5-8 I show a disyllabic tonal minimal pair – [po.fɔŋ] 'North wind' (Light-Heavy; $H_\mu \cdot L_{\mu\mu}$) and [nɔ:.fɔŋ] (Heavy-Heavy; $L_{\mu\mu} \cdot H_{\mu\mu}$) – in different following tonal contexts. Again, the Light-Heavy disyllable shows a pitch variation only in the very last mora, while the Heavy-Heavy disyllable remains constant in tone over different contexts.

Abstracting away from the independently motivated tone sandhi processes (cf. Shi and Jiang 2013; Zhu 2020), what remains crucial is the immediate tonal context of the proposed toneless mora (marked with \emptyset). In the Light-Heavy disyllable [po.fɔŋ], there is a clear contrast between a low rising pitch in Figure 5 and a low level pitch in Figure 6 (in red). This sort of pitch variation, however, is absent in Figure 7 and 8, where the disyllable [nɔ:.fɔŋ] is Heavy-Heavy (both are H level pitch). Below I summarize the pitch patterns similar to the format in (7).

- (8) a. [L- μ -H]: low rising pitch in the middle mora
 b. [L- μ -L]: low level pitch in the middle mora

Data in (7) and (8) demonstrate that a post-sandhi heavy syllable in Suzhou can surface in four possible pitch patterns: high level, low level, high falling and low rising. Crucially, rising/falling pitch can *only* surface in non-initial positions when the immediately preceding morpheme is monomoraic – that is, in the second syllable of a Light-Heavy disyllable³. The fact that these pitch alternations are observed under different tonal contexts provides strong phonetic support for an "interpolation" account, where the third mora of a Light-Heavy disyllable is simply toneless, and only carries interpolated pitch from two surrounding tonal targets. On the other hand, Heavy-Heavy disyllables demonstrate stable pitch patterns uninfluenced by the immediately surrounding tonal contexts, which can be interpreted as true phonological tones. The next section offers a foot-based analysis based on Zhu (in prep.) which characterizes the pitch alternation in Light-Heavy disyllables systematically.

4 A foot-based analysis

As briefly mentioned in §2.2, there is independent structural motivation for the alternating moraic/syllabic trochee in Suzhou (i.e. Head-Dependent Asymmetry; see Drescher and van der Hulst 1998; Iosad 2013; Zhu in prep.). The data shown in the current study provides additional phonetic evidence for the

³ A falling pitch heavy syllable is also allowed in phrase-*initial* position due to an independent tone sandhi process. See Zhu (2020) for discussion.

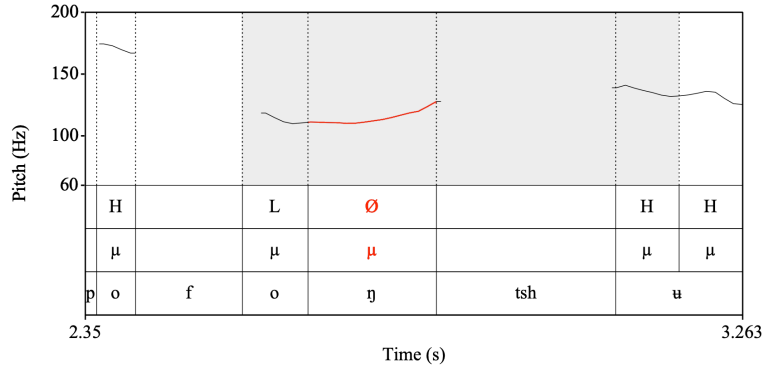


Figure 5. /H/μ + /T/μμ + /HH/μμ → [Hμ.LμØμ.Hμμ]. Gloss: [po.fɔŋ.tsʰu:] ‘north wind blows’

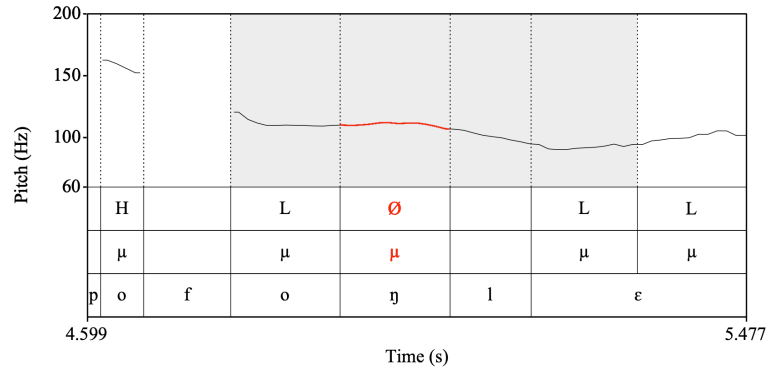


Figure 6. /H/μ + /T/μμ + /LH/μμ → [Hμ.LμØμ.Lμμ]. Gloss: [po.fɔŋ.lɛ:] ‘north wind comes’

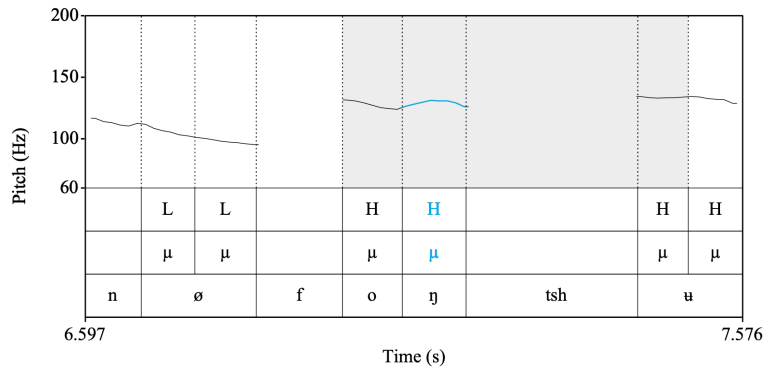


Figure 7. /LH/μμ + /T/μμ + /HH/μμ → [Lμμ.Hμμ.Hμμ]. Gloss: [nø:.fɔŋ.tsʰu:] ‘south wind blows’

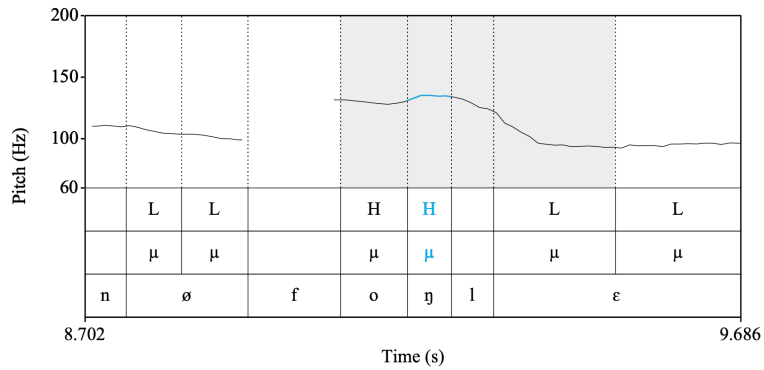
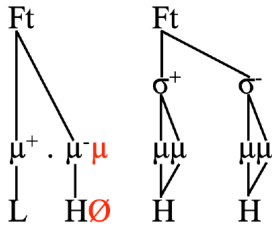


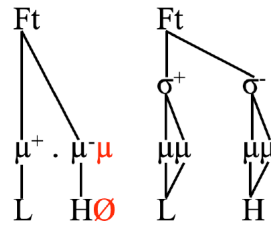
Figure 8. /LH/μμ + /T/μμ + /LH/μμ → [Lμμ.Hμμ.Lμμ]. Gloss: [nø:.fɔŋ.lɛ:] ‘south wind comes’

existence of such foot alternation. The crucial linking argument is that variable pitch in (7, 8) is caused by interpolation through a *toneless TBU* (here: mora), and the weight-sensitive foot alternation assigns such a toneless mora under precisely the correct conditions. In (9) I show the relevant metrical structure for a quadrisyllabic word of the weight Light-Heavy-Heavy-Heavy based on the data of Figures 1 and 2.

(9) Light-Heavy-Heavy-Heavy quadrisyllable: $[(\mu^+ \cdot \mu^-) \mu (\sigma^+ \cdot \sigma^-)]$



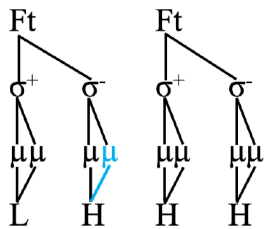
a. $[L_{\mu} \cdot H_{\mu} \emptyset_{\mu} \cdot H_{\mu \mu} \cdot H_{\mu \mu}]$ – high level in second σ



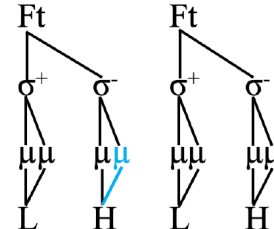
b. $[L_{\mu} \cdot H_{\mu} \emptyset_{\mu} \cdot L_{\mu \mu} \cdot H_{\mu \mu}]$ – high falling in second σ

In (9), the first Light-Heavy disyllable is parsed by a left-headed binary trochee *built directly on moras* (Kager 1993; see also Iosad 2016; Köhnlein 2016; Köhnlein and Zhu 2019). A direct consequence of such non-exhausting parse is that the last/third mora of the Light-Heavy disyllable is *unparsed*⁴. Assuming interactions of tone and foot structure along the lines of de Lacy (2002), I argue that TBUs that are unparsed by a metrical foot in Suzhou cannot host any phonological tone, and thus remains toneless on the surface (see also Duanmu 2007 for a similar account of Mandarin Chinese neutral tones). Due to its inability to be associated with tones even through spreading (compare the third and fourth syllables and examples 10 below), this mora surfaces with variable pitch which can be characterized as interpolation between tonal targets (H-H in 9a; H-L in 9b). Here, it is crucial to note the exact correspondence between conditions with pitch alternation and conditions that structurally motivate the bimoraic trochee parse – both being Light-Heavy disyllables. On the other hand, quadrisyllables with all four being heavy are fully parsed with two disyllabic feet, and do not show any pitch alternation in the second mora of the second syllable. This is shown in (10).

(10) Heavy-Heavy-Heavy-Heavy quadrisyllable: $[(\sigma^+ \cdot \sigma^-) (\sigma^+ \cdot \sigma^-)]$



a. $[L_{\mu \mu} \cdot H_{\mu \mu} \cdot H_{\mu \mu} \cdot H_{\mu \mu}]$ – high level in second σ



b. $[L_{\mu \mu} \cdot H_{\mu \mu} \cdot L_{\mu \mu} \cdot H_{\mu \mu}]$ – high level in second σ

Shown in (10) is the commonly assumed metrical analysis to left-dominant tone sandhi in Northern Wu: the relevant foot structure is a left-headed binary syllabic foot; parsing is exhausting, resulting in all moras being parsed throughout the four syllables. Since all TBUs are parsed, common phonological processes such as tonal redistribution and spreading (cf. Duanmu 1995; Chen 2000) apply. The most noticeable difference between (9) and (10) is that the second mora of the second syllable in (10) is parsed by the disyllabic foot and associated with the H phonological tone, while the mora in the same location in (9) is unparsed and must stay toneless.

⁴ This particular foot structure has a second heavy syllable only partially parsed, violating what is often referred to as Syllable Integrity (Prince 1976; 1980; Hayes 1995). Although the theoretical debate on foot typology and wellformedness is not central to the current study, recent research does suggest several counterexamples to Syllable Integrity. See Kager and Martínez-Paricio (2018) and Breteler (2018) for examples.

5 Discussion and conclusion

Through a controlled investigation of the pitch alternation phenomenon in Suzhou Chinese, I have provided additional support to a weight-sensitive footing alternation in the language, where the language uses moraic or syllabic parsing based on the weight relationship of the two syllables. From a structural wellformedness point, the moraic parsing is favored only in Light-Heavy disyllables as a repair strategy to lighter heads than dependents (Iosad 2013; Zhu in prep.). In all other weight combinations (i.e. Light-Light; Heavy-Heavy; Heavy-Light) a full disyllabic parse is preferred. Precisely corresponding to such a distribution is the condition where pitch alternation occurs: only in the third mora in a Light-Heavy disyllable. In §3 I have shown that the second heavy syllable of a Light-Heavy sequence can surface in all four possible autosegmental pitch representations (i.e. HH, LL, HL, LH), given the correct tonal context. On the other hand, the second heavy syllable of a Heavy-Heavy sequence does not demonstrate such an alternation.

The current study addresses a few key debates in phonological theory: prosodic typology, relationship between tone and metrical structure and treatment of so-called "toneless" TBUs in varieties of Chinese. The binary moraic foot proposed by Kager (1993) accurately accounts for the distributional fact that the last mora of a Light-Heavy disyllable is variable in pitch, and most likely toneless due to being unparsed (de Lacy 2002). In addition, the pitch alternation I have shown finds parallel in previous investigations of tonelessness by Myers (1998), and also resembles what has been described as "neutral tones" by previous researchers (Lee and Zee 2008; Y. Chen 2013). In turn, the data I have provided in Suzhou Chinese goes against the observation that toneless syllables/moras in regional varieties of Chinese often assume a "default L" (see Chen 2000 for examples). Lastly, the study provides a first look at phonetic realizations of toneless moras in Suzhou Chinese, while a larger scale, more carefully controlled future study would shed more light on the phenomenon.

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