TONAL COMPLEXITY AS A DIALECTAL FEATURE: 25 DIFFERENT CITATION TONES FROM FOUR ZHEJIANG WU DIALECTS

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ABSTRACT

Acoustic and auditory data are presented from an ongoing large-scale investigation into the tones and tone sandhi of the Wu dialects of Zhejiang province in East Central China. The citation tones from 4 sites (3 hitherto undescribed) in the little known Central Zhejiang area are described: Pujiang, Tonglu, Shengxian and Tiantai. Mean F0 and duration data are presented for the tones of these dialects. The data demonstrate a high degree of complexity, having no less than 25 Linguistic-tonetically different tones, including 3 different falling tones, and 4 different falling-level tones. The nature of the complexity of these forms is discussed.

1. INTRODUCTION

The Wu (Wú) dialects of East-Central China are notorious for their tone sandhi, which is said to be the most complex in the world (Rose 1990). However, we wish in this paper to focus attention away for once from the sandhi and onto the citation tones of Wu. This paper presents data on the tonal acoustics (F0, duration) of the citation tones in 4 Wu dialects, on the basis of which we contend that tonological complexity in Wu is not confined to tone sandhi, but is manifested also in citation tones which show a both a large (7-8) number of contrasts and a high percentage of contour and complex tones. Since very little is known still about the Southern Wu dialects in central and southern Zhejiang (Zhèjiāng), we have chosen to illustrate citation tonal complexity from this area.

2. PROCEDURE

The data are part of a large-scale investigation into the tones and tone sandhi of the Wu dialects of Central Zhejiang, and were collected by the first author in separate field trips to Zhejiang in February, May and July 1997. The 4 sites described here are Pujiang (Pǔjiāng), Tonglu (Tónglú), Shengxian (Shèngxiàn) and Tiantai (Tiāntāi). Linguistic classifications of the Wu dialects differ in whether they recognise a primary subdivision into 2 subgroups (Northern, Southern Wu), or several, one of which, Taihu (Tàihú), corresponds roughly to Northern Wu. According to Wurm et al (1987), who espouse the latter classification, the 4 dialects described belong in 3 separate subgroups: Tonglu, and Shengxian in the Linshao (Línshào) cluster of the Taihu subgroup; Pujiang in the Wuzhou (Wùzhōu) subgroup; Tiantai in the Taizhou (Tāizhōu) subgroup. The location of the 4 sites is shown on the accompanying map. It can be seen that they are not separated so much by horizontal as by vertical distance. The maximum distance between any two sites is ca. 140 km (Tonglu to Tiantai), but each site is separated by one or more mountain ranges.

The Tonglu variety we describe was recorded from a 46 year old male (WYG) from Shífǔzhèn, a town lying about 10 km N.E. of Tonglu, the county town of Tonglu county. Our Shengxian variety is from a 31 year old male speaker (FXL) from Shengxian town. Our Pujiang speaker is a 21 year old female (ZTT) from Pǔyángzhèn, the county town of Pujiang county. Our Tiantai speaker is a 17 year old female (ZBJ) from Héfāngzhào village, which is about 10 km. N.W of the county town of Tiantai county. Data were elicited using a list of Chinese characters representing common morphemes and balanced for segmental influence on tonal acoustics. Morphemes from all 8 historical categories (Yīnpíng, Yīnshǎng, Yīnqù, Yīnrù, Yángpíng, Yángshǎng, Yángqù, Yángrù) were chosen so that all citation tonal contrasts in any Wu dialect would be elicited. (These categories will be referred to below using I for Ping,

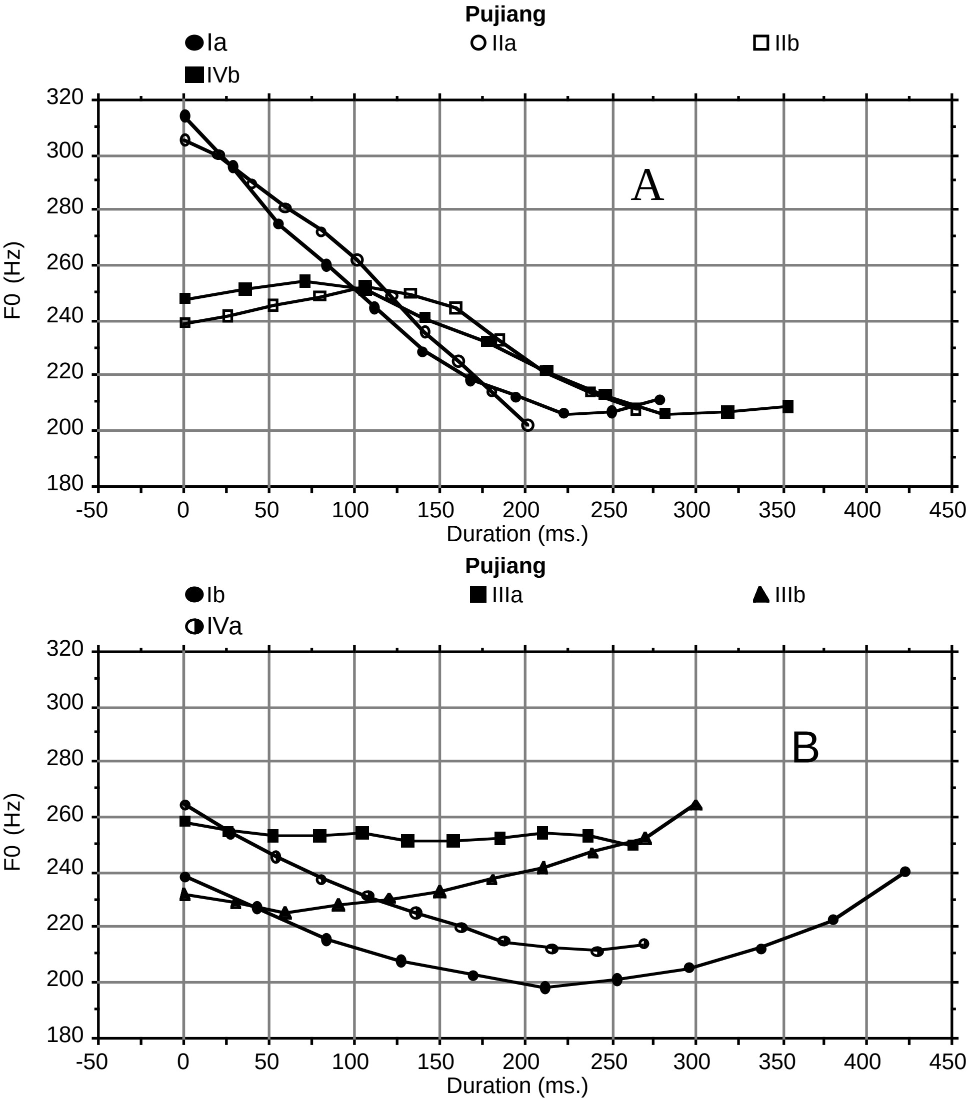


Figure 1: Mean F0 shapes for Pujiang tones

II for Shang, III for Qu, IV for Ru, a for Yin and b for Yang, for example IIIb = Yangqu.) There were invariably several minimal pairs in the readings. Data were first transcribed, and the tonological structure hypothesised. The F0 of the syllable Rhyme was then measured with CSL at a high enough sampling rate to resolve the details of its time course. Between 4 and 10 tokens were measured for each tone, from which means and standard deviations were calculated.

3. RESULTS

3.1 Pujiang

Pujiang contrasts 8 tonemes on monosyllables, only one of which, in the speaker's mid pitch range, is level [33] (IIIa). Of the other tones, two are non-complex contour tones: a high fall [51] (IIa), and a low rise [24] (IIIb). The remaining five tones are complex: a mid rise-fall [232] or [231] (IIb); a high falling-level [422] or [511] (Ia); a mid fall-rise/level [323] or [311] (IVa); a low dipping [212] (Ib); and a mid rise-fall-rise/level [2323] or [2311] (IVb). Pujiang is thus also notable for making contrastive use of a final level or rising pitch component which minimally distinguishes the two pairs rise-fall from rise-fall-rise/level, and fall from fall-rise/level. Tonal acoustics for our female Pujiang speaker are graphed in figure 1A and B, where mean F0 is plotted as a function of absolute duration. Figure 1A shows the contrast between simple contour tones without, and complex contour tones with, a final level component.

3.2 Shengxian

Shengxian contrasts 8 tones on monosyllables, 2 are level, 3 contour and 3 complex. The 2 level tones are lower-mid [22] (IIb), and short high with glottal stop [4?] (IVa). The 3 contour tones are: high to mid fall [53] (IIa); low rise [24] (IIIb); and short low rise with glottal stop [23?] (IVb). The 3 complex tones are high falling-level [411] (Ia); low falling-level [211] (Ib); and mid dipping [323] (IIIa). Mean tonal acoustic values for the male Shengxian speaker are graphed in figure 2. The pitch values of the Shengxian tones agree fairly closely with those in Chao's early description (1928:76,77), and Qian's (1992:57,58) description of 60 years later. The main differences are that our tone Ia falls lower than in the other descriptions, and it also seems to have developed its distinctive tail since 1928. The tail on Ib is also level rather than rising as previously described.

3.3 Tonglu

Tonglu shows 8 different pitch shapes on monosyllables. None are level. There are 4 contour tones: one (Ia) falls slightly in the mid pitch range [43] or [32]; one (IIIb) is low rising [14]; one (IVb) is short low rising with glottal-stop [14?]; one (IVa) is short high falling with glottal stop [54?]. The 4 complex tones are: low-rising mid level [133] (Ib); high falling to mid level [533] (IIa); mid dipping [434] or [323] (IIIa); high to mid fall plus rise [534] (IVa, possibly in free variation with [54?] -- some IVa morphemes have lost their final glottal stop and shortness, and have developed

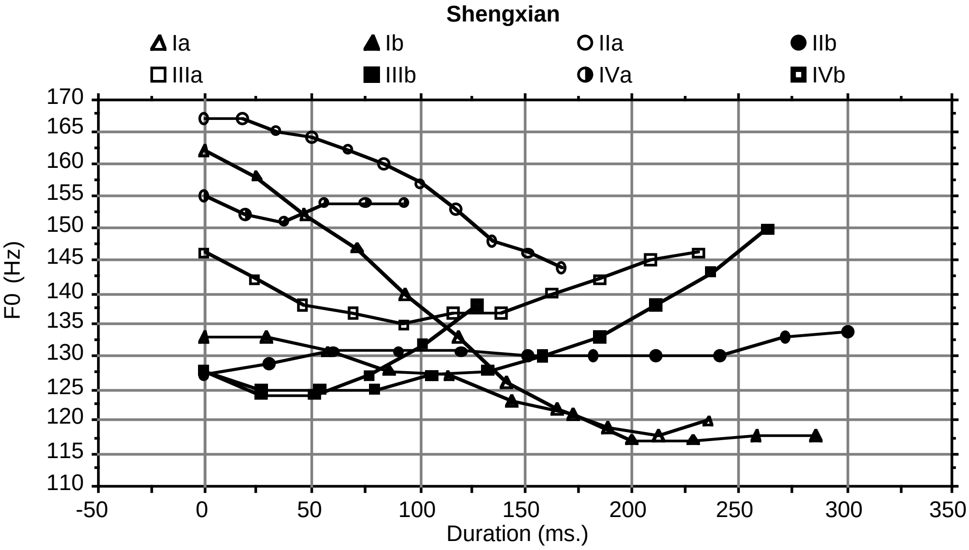
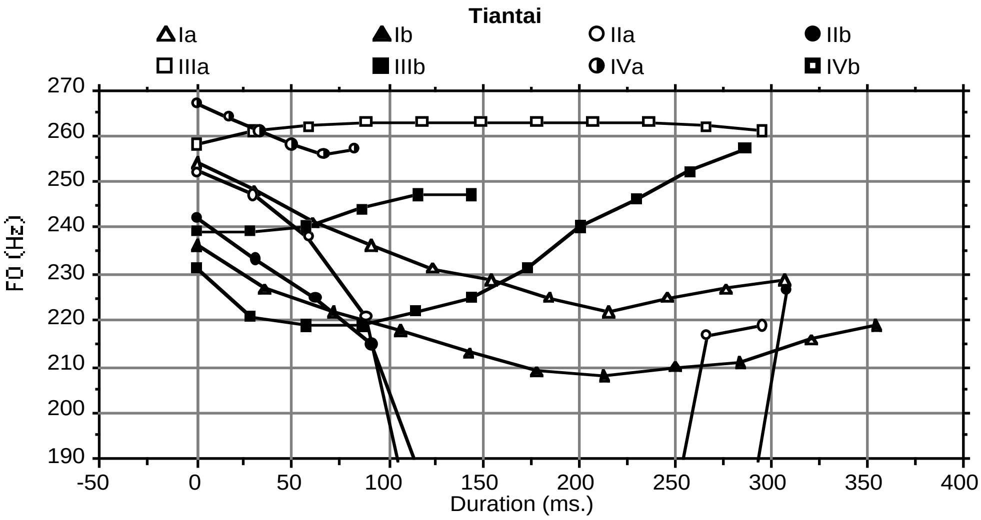


Figure 2 (above): Mean F0 shapes for Shengxian tones.
Figure 3 (below): Mean F0 shapes for Tiantai tones.



into [534]). Mean tonal acoustic values for our male Tonglu speaker are graphed in figure 4A and B.

3.4 Tiantai

Tiantai contrasts 8 tones on monosyllables, only one of which is level: the high level [55] (IIIa). There are 3 contour tones: a short high falling [54?] (IVa), a short stopped mid rising [34?] (IVb), and a low rising [24] (IIIb). The 4 remaining tones come in 2 pairs, each with a relatively higher and lower pitch. The first pair is complex, with a falling, then level or slightly rising pitch. One of them (Ia) is located in the mid pitch range [422 or 423], and one (Ib) in the lower pitch range [311 or 312]. The second pair of tones is notable for its distinctive creaky voice phonation, which our research has shown to be a common feature in the Tiantai locality. In both creaky tones the creaky voice sounds to occur in mid-syllable, before normal phonation is resumed with a pitch in mid voice range at the very end. The pitch before the creaky portion is high in one tone and slightly lower in the other. It is just possible to hear that the pitch falls immediately after this, although it is not possible to be sure whether this fall is deliberate, in which case we would be dealing with a complex tone with creak, or due to the adjustments in cord configuration that are necessitated by the creak, in which case we would be dealing with a simple contour tone with creak. Since cognates in the other dialects often have a falling pitch, the fall will be treated as deliberate, and the tones transcribed as [53~3] (IIa) and [42~3] (IIb).

4. DISCUSSION

The 4 dialects just described contain, conservatively, 25 different tonal pitch shapes. This rather high number is a function of several things. Firstly, it is simply typical for Wu to have a high number of tones. As is well known, however, this number results from the intersection of two independent dimensions in Wu, traditionally termed Yin/Yang and Shu/Ru. The former is usually described in Wu as a pitch height difference between historical pairs of tones; the latter as a difference between shorter pitch shapes truncated by a glottal-stop, and longer pitch shapes not thus truncated.

The data contain 6 Ru tones. For each, there is a corresponding Shu tone with a phonetically similar pitch value such that both Shu and Ru tones could plausibly -- indeed necessarily -- be considered allotonically related, with the short pitch shape conditioned by the glottal-stop (for example, TL tones IVb [14?] and IIIb [14]). However, the relationship between the pitch of such Shu - Ru pairs is not constant (not unlike the relationship in quality between 'tense' and 'lax' vowels in varieties of English). In the TL pair just given, the phonetic similarity obtains between both onset and offset pitch values. In TT, the agreement is in offset value (34? & 24); in SX in onset value (23? & 24). Traditional Chinese phonology treats Ru as a separate tonal category, and the phonological behaviour of the Ru tones in Wu also suggests that the Shu/Ru difference is a Linguistic Tonetic dimension.

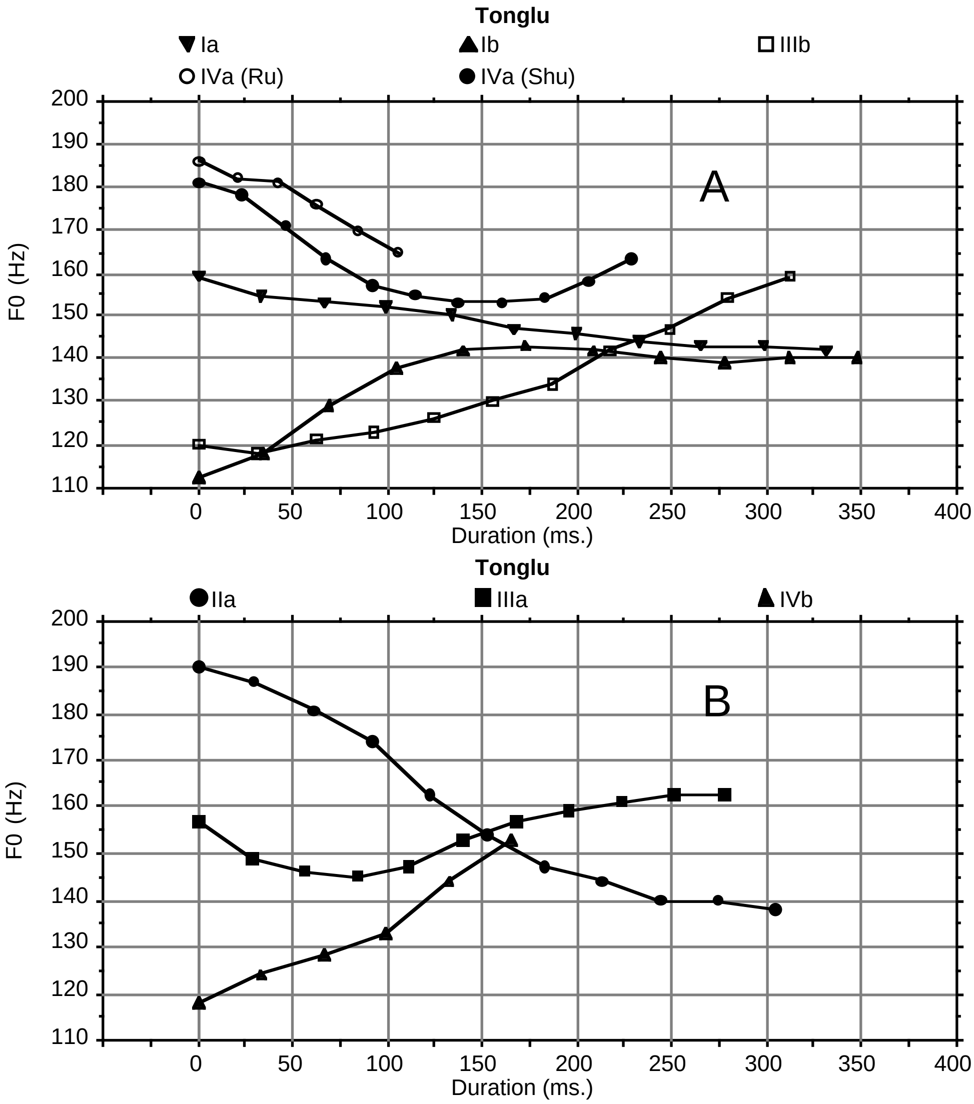


Figure 4: Mean F0 shapes for Tonglu tones

The data contain many historically paired tones that instantiate a possible yin/yang contrast. However, closer inspection reveals that not one but several different relationships are involved in the yin/yang dimension. Of these, only a single case reflects the usual (i.e Register) characterisation of pitch height difference: TL Ia [422 or 423] vs. Ib [311 or 312]. A more common relationship in the data involves the depressor effect first identified fir Chinese in Rose (1994), where the pitch onset of a contour is lowered. These Wu data show 3 subtypes, distinguished by the degree to which the lowering effect extends into the Rhyme. Depression without perseveration can be seen in the pairs PJ IIa/b [51] & [231]; PJ IVa/b [323] & [2323]; TL Ia/b [43] & [133]. In these examples, the depressor effect is only present at onset, so that the rate of fall of the non-depressed tone is regained. Longer perseveration can be seen in SX Ia/b [411] & [211], and TT IIa/b [53~3] and [42~3]; TL IIIa/b [434] & [14]; and SX IIIa/b [323] & [24]. In these examples the contour characteristics of the non-depressed tone are not restored until late in the Rhyme. Maximum perseveration is present in TT IIIa/b [55] & [24]; and PJ IIIa/b [33] & [24], where the height of the tone is not regained until its end. It may also be the case that the yin/yang stopped tone pairs, e.g. TL IVa/b [54?] & [14?], involve a single depressor effect undifferentiated with respect to perseveration because of the shortness of the Rhyme.

There remain 3 notable typological features in addition to the Shu/Ru, Depressor, and Register differences that account for the diversity in pitch shapes in these dialects. The first is the contrastive use of a level or rising pitch tail on falling pitch tones, exemplified above for Pujiang. The second is the use of a mid value as offset in tones with falling pitch. Examples of Linguistic Tonetic contrasts with this feature are SX IIa [53] vs. PJ IIa [51]; and TL IIa [533] vs. PJ Ia [511]. The third is Wu's apparent aversion to level tones: out of the possible 32 tones, only 4 are level.

5. REFERENCES

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