Short Research Paper

A Brief Introduction on a Research of Lanzhou Tonal Variation

Li Yi[1*] & Tianxin Wen[2]

[1] Foreign Language Department, China Agricultural University, Beijing, China

[2] The High School Attached to Northwest Normal University, Lanzhou, China

[*] Li Yi, Foreign Language Department, China Agricultural University, Beijing, China

Abstract

This paper gives a brief introduction on a research of an ongoing tonal variation in Lanzhou dialect, a northwest Chinese Mandarin. After doing data collection and sample analyses, we find that the tonal variation in this dialect appears in two ways: "Yinping" has two variants: a falling contour and a level contour; "Shangsheng" and "Qusheng" are merging. This phenomenon has been examined from three perspectives: a) phonology of Lanzhou dialect; b) perception test; c) social factors in language variation.

Keywords

tonal variation, merge, social factors, perception test

1. Introduction

Many studies on Chinese tone change have focused more on its results than on its progress. After scrutinizing all the literatures concerning Lanzhou dialect (Huang, 1960; LZU, 1963; Gao, 1980; Liu, 1983; Wang, 1984; Song, 1991; Wang & Zhao, 1997; Zhang, 2003; Liu, 2004; Zhang, 2005; Luo, 2007; Zhang & Mo, 2009; Deng, 2009; Zhang, 2012), we find *shangsheng* has been described variously as falling, convex, level and rising contours in different documents; *yinping* citation tone was recorded as a falling contour in most cases except Song (1991) and Zhang (2005), which deviates from our intuition and research.

Given this, we took a particular survey aiming at four Lanzhou districts (Chengguan, Xigu, Qilihe, Anning) on its citation tone system. It turns out Lanzhou dialect is under an in-progress change: *yinping* has two variant contours; and *yinshang* is merging into *qusheng*.

2. Prior Works and Research Hypotheses

There are 35 fluent speakers with age ranging from 15 to 79, including 14 males and 21 females. The education level varies from primary school (5-6 years) to postgraduate (18-20 years). Vocation covers police, teacher, student, workman, sales representative and those on freelance basis. We have picked 148 monosyllabic words and 292 disyllabic words for each speaker. A total of 23424 tokens were recorded and analyzed.

We put forward two hypotheses:

a. Citation *shangsheng* and *qusheng* are merging; and the merging is observable, though they are distinct in disyllabic words.

b. Citation *yinping* in Lanzhou dialect is undergoing a change from a falling tone to a level tone, which generates from disyllabic tone sandhi. In this progress, age plays the most important role, and gender and education also take their credits.

3. The Acoustic Description of Tone Changes

3.1 Merging of Shangsheng and Qusheng

Tone merging usually happens when tone values are similar or tone contours parallel (Cao, 1998). We propose the merging of *shangsheng* and *qusheng* in Lanzhou dialect belongs to the latter type.

We do find the idiolect contours shown in Figure 1 existing in Lanzhou, and we also find each participant has their *shangsheng* and *qusheng* paralleled or even coincided. It is also true *shangsheng* is in most cases a little bit higher than *qusheng*. In order to find whether *shangsheng* has merged into *qusheng*, we will find if the height is linguistically significant. Since their acoustic F0 values are very close, as shown in Figure 1, and it's hard to tell barely through physical values, a perception test will be adopted.
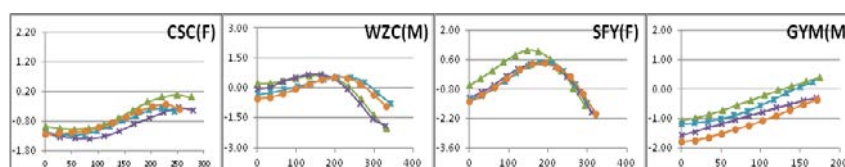

Figure 1. LZ-Score Tonal Patterns of *Shangsheng* and *Qusheng*

(sign: ▲—IIa ✳—IIb ✳—IIIa ●—IIIb)

3.2 Perception Test

We rearrange the sound recordings of 5 speakers (3 males and 2 females) as perception materials. There are 12 minimal pairs of *shangsheng* and *qusheng* words with identical onsets and rimes (Table 1). 15 participants are all fluent native speakers (3 females and 12 males).

245

Table 1. Perception Test Words

|						
shang	懂 dɔŋ	等 dən	粉 fən	岛 dau	响 ɕiaŋ	底 di
qu	冻 dɔŋ	凳 dən	粪 fən	到 dau	向 ɕiaŋ	帝 di
shang	动 dɔŋ	马 ma	痒 jaŋ	舅 tɕiu	买 mai	弟 di
qu	洞 dɔŋ	骂 ma	样 jaŋ	旧 tɕiu	卖 mai	第 di
shang	罢 ba		是 ʃi		妒 du	懂 dɔŋ
qu	霸 ba		士 ʃi		渡 du	动 dɔŋ

There are altogether 12 pairs of words of 5 speakers, 12 people listened to all, that is, a total of 1440 times listening; the other three people listened to materials of three people, a total of 216 times listening. We have done a simple calculation: out of 1656 times listening, 856 check boxes are right, in other words, 52.5% accuracy, which will help us to draw a conclusion that the two tones are merging, because the correct rate of sheer guess can reach 50%.
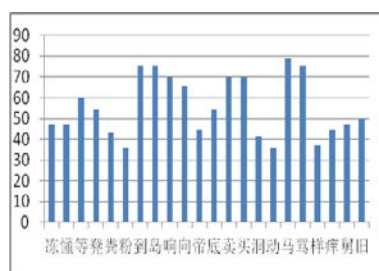
Figure 2. The Accuracy (%) of Each Word

3.3 Two Variant Contours of Yinping: Falling and Level

As aforementioned, most researchers took *yinping* as a low falling and *yangping* a high falling, though there was a disagreement on its value: Gao (1980) and Wang (1984) described them exactly the opposite: [31/53] vs. [53/31].

Our survey suggests a co-existence of two *yinping* contours (Figure 3), and the level contour is replacing the falling one. Figure 3 showed us the LZ-score normalized tonal pattern of *yinping* and *yangping* of 3 speakers. The two variants of *yinping* are quite distinct.
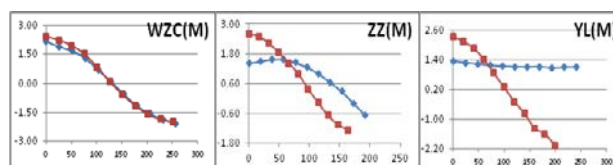
Figure 3. Tonal Patterns of *Yinping* and *Yangping* of Lanzhou Dialect（sign: ━◆━ Ia ━■━ Ib）

4. Correlation Factors

4.1 General Factors Distribution

Figure 4 lists the general distributions of two variants of *yinping* on locality, gender, age, vocation and education (left) and whether *shangsheng* merged into *qusheng* on each of them (right).
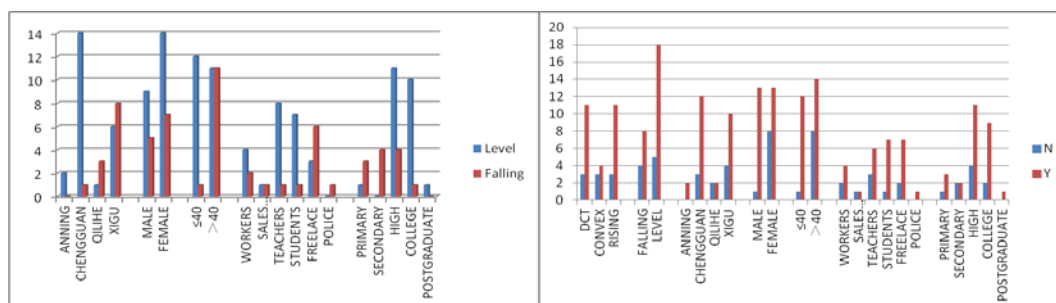

Figure 4. Distribution Factors of *Yinping* Variants (Left) and Merging of *Shangsheng* and *Qusheng* (Right) (with "Y" Stands for "Yes", and "N" Stands for "Not")

We could not draw a conclusion that locality influences the variations, since the speakers are not chosen on the basis of random sampling, besides, there is frequent staff flow among four districts. However, we still could get a glimpse of distribution on different districts of the city.

67% of female speakers and 64% of male speakers produce *yinping* a level contour. We could not tell the role gender plays solely on the calculation. However, on the merging of *shangsheng* and *qusheng*, gender shows a great difference. Totally, 93% of male speakers and 61% of female speakers have their *shangsheng* and *qusheng* merged.

We divide all the speakers into two groups: those over 40 years old and those under 40. We found 65% of speakers over 40 produce *yinping* a falling contour and 94% of speakers of under 40 produce *yinping* a level contour. We could draw a rough conclusion that age is an important factor. On the merging of *shangsheng* and *qusheng*, 92% of speakers who are under 40 and 63% of those who are over 40 have *shangsheng* and *qusheng* merged.

We propose that people with higher education and more stable vocations are more liable to produce *yinping* a level contour and the merging of *shangsheng* and *qusheng* shows no obvious tendency in the factors of vocation and education.

4.2 Tone Sandhi's Effect on "Yinping" Variation and the Phonologization of "Yinping" Citation Tone

We checked *yinping* tonal pattern in disyllabic words for each speaker when it happened in initial syllable and final syllable respectively. We found *yinping* experienced a change from a falling tone to a level tone. It first happened in initial syllable and then diffused to the second syllable. Though it doesn't happen in a clear-cut and neat way, we still could peep a tonal diffusion in Lanzhou dialect.

We propose the underlying representation of citation *yinping* a falling contour, and it experienced the following phonological process:

Ia falling contour →level contour/ [__T

T=any tone category (the underlying falling contour of *yinping* becomes a level contour when it appears in initial syllable of a disyllabic word.)

We make a further deduction that the surface form *yinping* in disyllabic word will be in place of the underlying form, especially for those who are more sensitive to the prestigious language, like women (Labov, 1963, 1966), or those with longer education time, since the surface form coincides with the citation *yinping* of Mandarin, the most prestigious language in China. It will further replace the falling variant in citation *yinping*.

5. Conclusion

The tone change in Lanzhou dialect could not have happened very long ago, since two variants of *yinping* coexist in one family and the merging of *shangsheng* and *qusheng* is also observable. While checking the documents, we find tone merging also happens in Hebei and Jiaodong, the east Mandarin (Qian, 2000). When we check the documents again, we find the recordings of *yangping*, a high falling, and *qusheng*, a low rising, either on their values or their contours, seldom have had variants, which was not the case for *yinping* and *shangsheng*. The two directions of tone changing produced a more open acoustic space, in other word, the changes of *yinping* and *shangsheng* were more likely to avoid the congestion of used tonal pattern, which could partially be proved by the tone sandhi, since the combination of "*yinping+yangping*" is the easiest one to make *yinping* change from a falling to a level contour.

Till now we haven't found any factors relevant to the merging of *shangsheng* and *qusheng*, while Zhu and Yi (2015) found the similar trend in Xining, Yongchang and Haiyuan. We here took it as a natural tone evolution and hope to find more evidences in further researches.

References

Cao, Z. Y. (1998). The tonal pattern of Dunhuang Dialect. *Chinese Studies*, *1*, 11-15.

Deng, W. J. (2009). The Traits of Three-Tone Dialects Distribution in Northwest China. *Journal of Lanzhou University*, *3*, 66-72.

Gao, B. T. (1980). A brief introduction of Lanzhou phonology. *Dialect*, *3*, 224-231.

Huang, J. R., & Jun, Z. (1960). Lanzhou Dialect. *Journal of Xibei Normal University*, *1*, 71-122.

Labov, W. (1963). The social motivation of a sound change. *Word*, *19*, 273-309. https://doi.org/10.1080/00437956.1963.11659799

Labov, W. (1966). *The Social Stratification of English in New York City*. Washington, DC: Center for Applied Linguistics.

Lanzhou University, Department of Chinese. (1963). Lanzhou dialect. *Journal of Lanzhou University (Social Sciences)*, *2*, 81-141.

Liu, L. (1983). Comments on New Lanzhou Dialect. *Journal of Lanzhou University (Social Sciences)*, *3*, 106-121.

Liu, L. L. (2004). *Chinese Tones*. Nanjing: Nanjing Normal University.

Luo, P. (2007). The Present Situation and Division of Gansu Dialects. *Journal of Gansu Normal College*, *12*, 1-4.

Qian, Z. Y. (2000). Chinese Tone Evolution in The View of Chinese Dialects. *Language Teaching and Research*, *2*, 1-9.

Song, F. R. (1991). Comparative Study on Lanzhou Dialect. *Journal of Lanzhou Education Institute*, *2*, 59-62.

Wang, S., & Zhao, X. G. (1997). *Sound Files of Lanzhou Dialect*. Shanghai: Shanghai Education Press.

Wang, Y. L. (1984). Comparison and Contrast Between Lanzhou Dialect and Chinese Mandarin. *Social Science*, *3*, 13-17.

Yi, L. (2014). *Shangsheng in Lanzhou Dialect*. The 11th Academic Conference of Chinese Phonetics, Urumqi, China.

Yi, L., & Duanmu, S. (2015). Phonemes, Features, and Syllables: Converting Onset and Rime Inventories to Consonants and Vowels. *Language and Linguistics*, *16*(6), 819-842. https://doi.org/10.1177/1606822X15602610

Zhang, A. S. (2005). The New Exploration on History of Yangping and Shangsheng Merge. *Journal of Heibei University*, *1*, 77-84.

Zhang, G. Y. (2012). Statistic Analysis on Tonal Pattern of Lanzhou Citation Tones. *Modern Chinese (Linguistic Research Edition)*, *3*, 12-18.

Zhang, W. X., & Chao, M. (2009). *Lanzhou Dialect Dictionary*. Beijing: China Social Sciences Press.

Zhang, Y. L. (2003). *Phonetic Study on Lanyin Mandarin* (PhD Dissertation). Beijing Yuyan University.

Zhu, X. N., & Li, Y. (2015). Tonal Patterns in Mandarins of Northwest China. *Chinese Studies*, *10*, 1-11.