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On Tone Form Pattern of Chongqing Dialect

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Abstract
Chongqing dialect belongs to Chengyu piece of Chuanqian patch attached to the Southwest Mandarin, which includes four tones called Yinping 45, Yangping 31, Shangsheng 441 and Qusheng 213. The tone form pattern of Chongqing dialects is one of the best collocation model with high and low, straight and turning pitches. The optimal method confirmed to summarize the tone form pattern in the studies of not only a practical significance to the further study of the tone of Chongqing dialect, but also of a certain guiding significance to the summarizing of tone form patterns of other Chinese dialects or other tone languages.

Key words: Chongqing dialect; Southwest mandarin; Tone form pattern

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INTRODUCTION
Located in southwest among Provinces of Sichuan, Guizhou, Hunan, Hubei and Shanxi, Chongqing cities one of the central areas of Southwest Mandarin and also an important representative dialect of Southwest Mandarin. To be specific, there are few internal differences in Chongqing dialect which will lead communication barriers, and only some differences in pronunciation, vocabulary and other aspects exist in Jiangjin and Qijiang dialect (Zhai,1996).

1. TONE CATEGORIES AND TONE PITCHES OF CHONGQING DIALECT
The tone system of Chongqing dialect is comparatively simple with only four tone Categories of Yinping, Yangping, Shangsheng and Qusheng. Ancient level tones have evolved into Yinping and Yangping, ancient voiceless and wholly voiced falling-rising tones into Shangsheng, ancient falling and ancient wholly voiced falling-rising tones into Qusheng, and ancient entering tone has been incorporated into Yangping. The researches on the tones of Chongqing dialect have been carried out a long time ago. Mr. Yuenren Chao (1922) used a simulation method to study its tone system in 1922 and recorded it in the staff. Later, Ding Shengshu and Dong Tonghe described the tones of Chongqing dialect respectively in 1941 and 1946 (Yang, 1984). After 1950s, more and more researches on the tones appeared. Table 1 summarizes the previous descriptions of the tone categories and tone pitches of Chongqing dialect .

Differences in recording the tone pitches in Table 1 show that the tone pitches of Chongqing dialect today still have not achieved widespread unity. In recent years, some researchers use experimental methods to study the tones of Chongqing dialect, some get the experimental tone pitches by taking the average value of T from many pronunciation partners, and some from individual speakers. There are still some researchers who use the new theories and new methods of describing the tones to analyze the tones of Chongqing dialect. They have solved some problems but meanwhile also produced some other new problems, or

Table 1
Tone Categories and Tone Pitches of Chongqing Dialect

Researchers and the years	Yinping	Yangping	Shangsheng	Qusheng
Chao (1922)	44/445	11/21	552/52	24
Ding (1941)	55	31	42	25
Dong (1946)	45/55	31	42	24
Dialect survey working group of Sichuan university (1960)	55	21	42	214
Fan (1979)	55	11	42	13
Zhai (1986)	55	31	42	214
Zhai (1996)	55	21	42	214
Zeng (1996)	55	21	41	213
Dai , Zhou (1999)	55	21	42	213
Zhong (2005)	55	21	42	214
Fu (2009)	34	21	41	213
Wu (2009)	44	21	42	214
Liang, Meng (2010)	45	31	341	213
Huang (2011)	45	21	42	213
Zeng (2013)	45	31	441	214

Note. The four tone pitches of Mr. Chao's in the table are based on his staff records transcribed into five degree system.

the researches do not represent the actual situations of the tone form pattern of Chongqing dialect.

2. EXAMPLE CHARACTERS AND SPEAKERS

To meet the needs of experimental researches on tones, the paper chooses example characters combined in terms of the same initials (some sort of [t]) with finals ([i,u,o,a]) (see Table 2) in each tone pitch to ensure that different tones would not be affected by different syllable combinations. In segmentation of tone bearing sections, the research not only pays attention to the influences of initial consonants, the vocal initial state and other factors on the tone front, but considers the interferences the tone endings may be subject to arise from the pitch attenuation and non-phoneme glottal endings, and have made corresponding treatment to minimize the effect of preceding and posterior parts of tone on the tone bearing sections as far as possible. Also, all scramble example characters in the recording with sufficient numbers before and after each is prepared to prevent the possible page impacts on the tones.

Table 2
Example Characters of Chongqing Dialect

Tone categories	Exmple characters			
	[ti]	[tu]	[to]	[ta]
Yinping	低	都首都	夺	他[tʻa]
Yangping	敌	读	多	答
Shangsheng	底	赌	躲	打
Qusheng	弟	度	舵	大

In addition, a number of different gender speakers are also used here. Zhu Xiaonong (2005) believes that "a sufficient number of subjects are not only necessary to the study of pronunciations, but necessary for acoustic studies". It is important in experimental study of tone to use more speakers to reduce as far as possible the impact of individual factors on the tones, which would better ensure the objectivity, comprehensiveness and accuracy of the conclusions. And as we have mentioned, dialect is not stable enough for people who are too young, and too old people may be vague on pronunciation. Both will cause unnecessary trouble in tone experiments (Ming, 2013). So we here choose people who are more than 50 years of ages, but generally not more than 70. All the speakers are from the main city with the most stable pronunciations and can be representing the dialect outlook the most. Table 3 shows the speakers' basic information for the experiment.

Table 3
Speakers' Basic Information

Number	Code	Year of birth	Education	Occupation	District	State of pronunciation
F1	JL	1956	College	Teacher	Yuzhong district	More formal
F2	YMQ	1956	College	Public servant	Yuzhong district	Natural
F3	ZhYJ	1952	Junior middle school	Worker	Jiangbei district	Natural
F4	FYX	1962	College	Worker	Jiulongpo district	Natural
F5	ZhWJ	1952	Junior middle school	Worker	Shapingba district	Morelnatural
M1	YShX	1956	Senior middle school	Worker	Yuzhong district	More formal
M2	ChQX	1953	College	Teacher	Yuzhong district	Natural
M3	ZhXC	1952	Primary school	Worker	Jiangbei district	Natural
M4	QT	1961	Senior middle school	Worker	Jiulongpo district	Natural
M5	WGZh	1943	Junior middle school	Worker	Shapingba district	Natural

3. TONE FORM PATTERN OF CHONGQING DIALECT

The fundamental frequency data from the recording material is treated by unitary processing and every speaker's LZ value of fundamental frequency is obtained (Without unitary processing the fundamental frequency data does not have the significance of the study of linguistics. Treating by unitary processing is to eliminate interpersonal differences to get information with linguistic significance and make studies of interpersonal comparisons and interlingual comparisons possible.) According to the value, we draw the map of every speaker's tone form pattern (see Figure 1). In every small map in Figure 1, the horizontal axis shows the time duration (unit: ms) and the vertical axis, the speaker's LZ value of fundamental frequency.

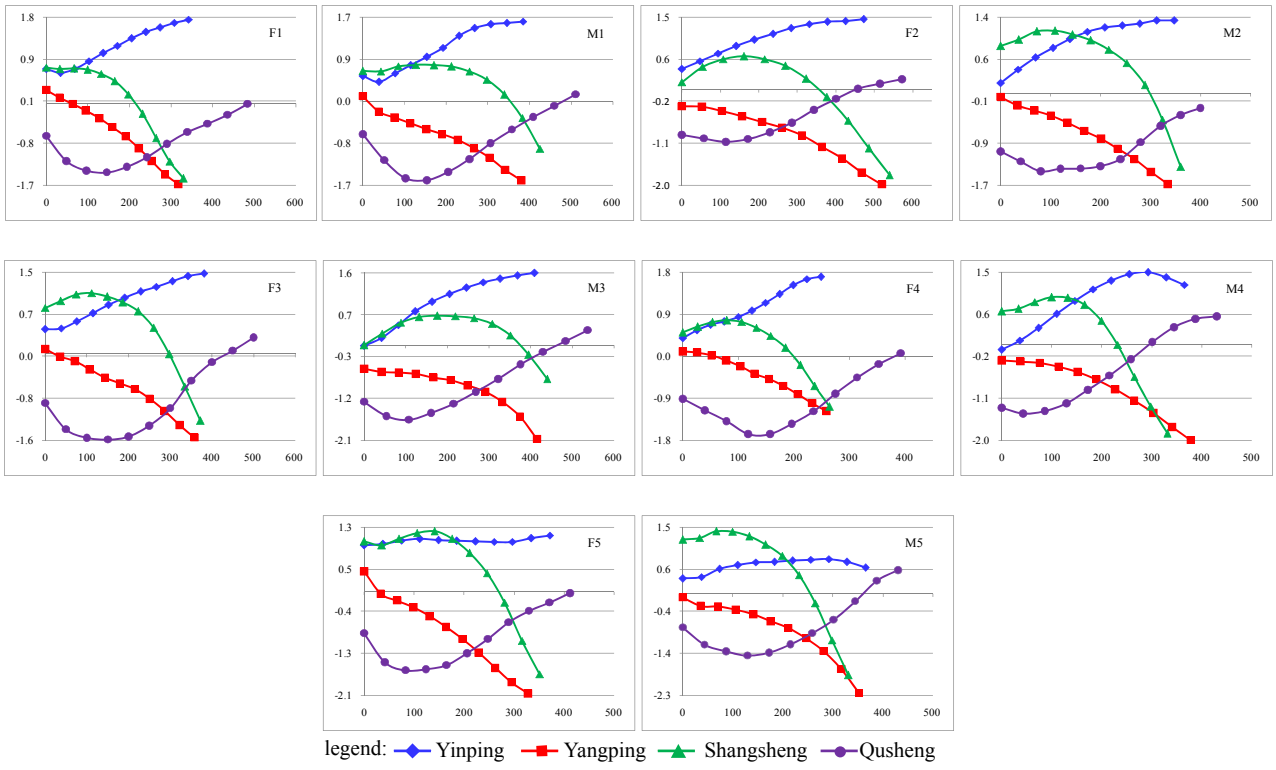

Figure 1
10 Speakers' Tone Form Patterns in Chongqing Dialect

Yinping is on the upper level of the pitch ranges of all the speakers' tone form patterns, basically with rising arches and only No.5 female with a flat arch. Falling arches of the arising pitch show the most consistence. Except the slightly higher starting point of No.5 females, all are middle falling. Yangping is also a falling arch, but different from the straight falling arch of the rising tone. In the front it often has a very obvious rising (or flat) trend, and then falls. As for the height, the starting points of falling-rising tone are almost from degree 4, and maintain for a period of time and then decline. Some are convex to degree 5 and then decline, or start from degree 5 and maintain for a period of time to then decline. The ending points are almost at degree 1, and some individuals are at degree 2 (such as No.1 male and No.3 male). So on the whole, Shangsheng should be in form of curved falling or a convex falling arch. The falling tones are mainly in forms of low falling and rising from degree 1 to degree 3 (or degree 4, often the lowest point at degree 4), parts of them (No.2 female and No.4 male) are rising, but some small parts of the front are falling, basically between degree 2 and 4.

When doing the experimental analysis on dialect tones, we do not study out the tone pitches only by the tone form patterns obtained from fundamental frequency data, which will make people fall into the tone form patterns with numerous differences at a loss. After all, person's tone form pattern may exist certain differences. Some researchers may average fundamental values treated by unitary processing to obtain the final pitches, but in fact, this is not the best way because the same tone variants may have different arches. If the average values are under the conditions without distinguishing different arches, the conclusions will be artificially distorted. However, specific standards of different arches are not easy to determine and different dialect tones have different actual situations, which make the operations difficult in ones' imaginations. So average values taking must have preconditions, but it is not the best way and difficult to operate, which shows the limitations of tone experimental studies and the advantages of the traditional studies of tones (not saying turkey to one and bazzard to another, just saying processing different tones at different stages). The best approach is the combination of the two methods, that is, on the basis of the experimental results, combine ones' hearing senses and other factors to induce a certain tone form pattern phonologically, meanwhile also accommodate certain tone variants in basic patterns. Using this way to induce the tone form patterns is not only to avoid the endless differences in the experiment, but also to take care of one's hearing senses. According to this principle, tone pitches of Chongqing dialect may be summarized as Table 4.

Table 4
Experimental Tone Pitches of Chongqing Dialect

Tone categories	Tone pitches	Variants	F1	M1	F2	M2	F3	M3	F4	M4	F5	M5
Yinping	45	55/35	45	45	45	45	35	45	45	35	455	55
Yangping	31	41	31	31	31	31	31	31	31	31	41	31
Shangsheng	441	451/551	441	442	441	551	451	342	441	451	551	551
Qusheng	213	214/24	213	213	24	213	214	214	213	14	214	324

Table 4 shows that the experimental tone pitches for Yinping are in tone of high-rising, also in line with our senses of hearing, which can be reduced to 45 while accommodating a capacity of two variants of 55 and 35. Yangping can be reduced to the middle-falling31 and its variant high-falling 41. Though the experimental values of Shangsheng are recorded as curved-falling, arch bulged forms can not be ignored. So they can be reduced to high-falling-curved tone 31 while accommodating a capacity of two variants of high-bulged-falling tone 441 and high-curved-falling 551. And Qusheng is almost low-falling -rising tones with the endings not high or low, which can be reduced to 213 while accommodating a capacity of two variants of 213 and 24 (14). Figure 2 shows the model of tone form pattern induced from the tone pitches of Chongqing dialect.

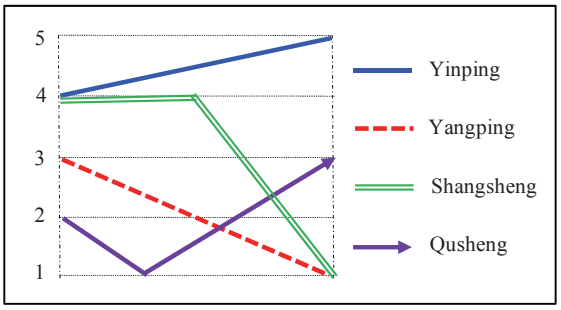

Figure 2
Model of Tone Form Pattern of Chongqing Dialect

From the model of tone form pattern in Figure 2, the collocations of pitches and the arches of Chongqing dialect make interesting. In the four tones, two high pitches and two low pitches exist respectively. Two

straight arches are opposite with one is rising and the other falling. The two wiggly arches are opposite with one is falling-rising and the other, curved-falling. They are in perfect balance in the pattern. There are also obvious differences between the four tones. High-rising high and level tone is opposite to the middle rising tone, and the high-turning-falling-rising tone, the low-falling-rising tone. In the two high pitches, the high and level tone is high rising on the top level of the whole pitch ranges and the falling-rising tone is high-turning falling. But in the two low pitches, the rising tone is middle falling and the falling tone is low falling-rising at the bottom of the whole pitch ranges. It is a best distinctive pattern that the tones in Chongqing dialect collocate in changeable pitches which have come into being after a long time evolution and fixed.

CONCLUSION

The experimental results show that the tone form patterns of Chongqing dialect may be considered to be a best distribution, which has considerable stability with proper collocations of high and low, turning and straight. In the patterns, the high and level tone is traditionally recorded as Yinping 55, but in fact, it is high-rising tone 45. Yangping and Qusheng go in good line with the results of the traditional study, respectively corresponding to middle-falling tone 31 and low-falling-rising tone 213. Shangsheng is a high-falling-curved tone 441, which is different from the traditional record of high-straight-falling tone 42. It can be said that the tone form pattern of Chongqing dialect is one of the best collocation model with high and low, straight and turning pitches, which show a trend of distinctive features.

In the analysis of the tone form pattern and its characteristics of Chongqing dialect, we have also discussed the generalizing methods and determined the best ones. The optimal method confirmed to summarize the pattern of the tone form in the studies of not only a practical significance to the further study of the tone of Chongqing dialect, but also a certain guiding significance to the summarizing of tone form patterns of other Chinese dialects or other tone languages.

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