

## Some Aspects of Tonal Development in Chinese Dialects\*

Ting Pang-hsin

### 1. Introduction

Although different theories have been proposed in recent years about the origin of the tones of Archaic Chinese,<sup>1</sup> it is generally held that there were four tone categories in Archaic (cf. Ting 1981) as well as in Ancient Chinese.<sup>2</sup> These tone categories might have derived from final consonants in Proto-Chinese, but eventually changed into various tonal systems in all modern dialects, such as Northern Mandarin, which has four or three tones and Cantonese, which has nine or more tones. Tonal splits and mergers were mainly conditioned by the contrast of voiceless and voiced initial consonants, and sometimes by sonority or aspiration (cf. Li 1980). In the process of tonal developments, it is worthwhile to observe some facts which may lead to new methods in reconstructing the value of proto-tones. Three aspects of tonal developments will be discussed in this paper.

### 2. "Sandhi tones" as proto-tones—the case of Southern Min<sup>3</sup>

In the Lin-kao dialect, also called the Be language, of Hainan Island, I recorded two sub-dialects having the following tonal systems:

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1. Archaic Chinese denotes the language of roughly the first millenium B. C.

2. Ancient Chinese denotes the language of roughly the sixth century.

3. Mantaro Hashimoto also discussed the same problem in his forthcoming paper, to be published in this volume. Professor Hashimoto and I have almost the same idea.

	1	2	3	4	5	6
L1	35 <sup>4</sup>	55	33	11	<u>55</u>	<u>33</u>
L2	11	55	33	22	<u>55</u>	<u>33</u>

There is only one case of tone sandhi that occurs in L1. For instance:

ba 35 "fish"	ba 11 kim 35 "gold-fish"
	ba 11 diam 55 "fish shop"
	ba 11 laŋ 33 "salted fish"
bui 35 "to cut"	bui 11 ŋau 11 "to cut rice plant"
teŋ 35 "to be born"	teŋ 11 ŋit <u>55</u> "birthday"
tsui 35 "hammer"	tsui 11 het <u>33</u> "iron hammer"

The rising tone 35 preceding any tone changes into a low level tone 11. Compared to the tonal system of L2, which has no sandhi forms, it is quite natural to conclude that the sandhi form of tone 1 in L1 is very likely the tone value of proto-tone 1. In other words, we may consider the sandhi tone 11 as the basic or underlying form of the isolated tone 35. This differs completely from the traditional view of linguists in Chinese phonology. They usually use "basic tone" and "sandhi tone" to indicate the tones of a syllable in isolation and in sequence respectively. (cf. Tung 1960: 730-731). Now, we may hypothesize that the sandhi tones in sequence are more conservative in keeping the value of proto-tones.

This simple method of internal reconstruction to a certain degree may be applied to much more complicated data such as that of the Southern Min dialects. Since Amoy is the most studied sub-dialect in this group, its tones and sandhi forms are given below:

4. Following the "tone letter" notation proposed by Y. R. Chao (1930), I use the numerals 5, 4, 3, 2, and 1 to designate different pitch levels from high, half-high, mid, half-low and low respectively. Short tones are underlined.

	1	2	3	4	5	6	7	8
	(Yin- p'ing)	(Yang- p'ing)	(Yin- shang)	(Yang- shang)	(Yin- ch'ü)	(Yang- ch'ü)	(Yin- ju)	(Yang- ju)
"Basic tones"	44	24	53	=6	11	33	42	44
"Sandhi tones"	↓ 33	↓ 33	↓ 55		↓ 51	↓ 11	↓ 44, 53	↓ 11

Bodman (1955), Wang (1967), and Hirayama (1974, 1975) presented significant discussions on these phenomena. The analyses of Bodman and Wang are essential to synchronic study but not related to historical reconstruction. Only Hirayama (1974, 1975) proposed to choose some of the sandhi tones as the tone values of Proto-Amoy. His choice is based on two reasons: 1) A simple explanation can be given for the changes from proto-tones to either "original" or "sandhi" tones in modern Amoy. 2) It should be easy to differentiate the values of proto-tones and, on the whole, to reconstruct a well-shaped tonal system. Diverging from Hirayama's proposal, I would simply take all the sandhi tones into consideration. But because tones change so easily and drastically in Chinese dialects, reconstructing the photo-tones of any dialect involves many factors which are difficult to handle. The methods of internal reconstruction and comparative studies have to be combined in order to solve this problem. In addition to Amoy, four tonal systems of the main sub-dialects of Southern Min are cited as follows:

	1	2	3	4	5	6	7	8
Lung-ch'i, Chang-chou (Tung 1960)								
"Basic tones"	24	313	53	=6	31	33	32	13
"Sandhi tones"	↓ 33	↓ 33	↓ 35		↓ 51	↓ 11	↙ 44, 53	↘ 11
Chin-chiang, Ch'üan-chou (Tung 1960)								
"Basic tones"	44	24	55	33	31	31	53	35
"Sandhi tones"	↓ 44	↓ 11	↓ 35	↓ 11	↓ 55	↓ 11	↙ 55, 53	↘ 11

## Ch'ao-chou (Chan 1959)

"Basic tones"	33	55	53	35	213	11	21	44
"Sandhi tones"	↓ 23	↓ 213	↓ 24	↓ 21	↙ 42, 53	↓ 12	↘ 33, 44	↓ 21
Ch'eng-mai, Hainan (Ho 1981)	22	41	21	33	24	=1	55, 55	33, 33

The value of nearly every single "basic tone" is divergent. Depending on the above data alone, the proto-forms of these tones can hardly be reconstructed. But, except for Tone 5, all the "sandhi tones" clearly show resemblance. It seems plausible to take these sandhi tones directly as proto-tones as mentioned above. But special attention must be paid to the Ch'eng-mai dialect in Hainan which has no sandhi forms, and may in fact preserve the tones of an earlier stage, one which had not undergone the usual tonal change, and which may therefore play a decisive role in the Southern Min dialects. We must make detailed comparisons between the Hainan tones and the sandhi tones of the other sub-dialects. But before going any further, more data from Hainan sub-dialects should be considered:

	1	2	3	4	5	6	7	8
Ch'eng-mai (Ho 1981)	22	41	21	33	24	=1	55, 55	33, 33
Lo-hui (Ho 1977)	44	22	21	=6	13 ↓ 55	42	55 ↓ 53	22 ↓ 22
Hai-k'ou (Chang 1976)	13	22	21	=6	35	33	55	33
Ting-an (Norman 1969)	24	22	21	33	35	24	55	33
Wan-ning (Chan 1958)	33	11	21	53	13	=4, 5	44	12
Wen-ch'ang (Yüan 1960)	33	11	21	=6	24	53	44	21

Roughly speaking, Tone 1 is a half-high or mid level tone in Hainan sub-dialects. Its tone value corresponds to the sandhi tones of the other sub-dialects. We posit the value \*33 for the proto-form of this tone.

Compared to Tone 1, Tone 2 is relatively a mid-low or a low level tone. Except for a few places which may have individual changes, the Hainan tones also coincide with the sandhi tones of the other sub-dialects. We reconstruct \*11 for Tone 2.

Tone 3 in all Hainan sub-dialects is somewhat peculiar phonetically. There is a glottal stop which is pronounced simultaneously. I stated elsewhere (cf. Ting 1981: 276) that the glottal stop is a redundant feature of this low falling tone. It bears no significance on the reconstruction of the proto-language. The low falling contour is probably an innovation of the Hainan sub-dialects, and therefore, both the contour and the glottal stop can be neglected in the comparison. The sandhi tones of Tone 3 in Lung-ch'i, Chin-chiang and Ch'ao-chou all have a similar contour. We posit \*35 as the value of the proto-form of Tone 3.

Tone 4 shows a discrepancy between Hainan tones and the sandhi tones of the other sub-dialects. It is at present premature to reconstruct any value for Tone 4 on the data provided. More study needs to be done before we arrive at any conclusion.

Tone 5 is also problematic. Hainan sub-dialects point to a rising tone, but the sandhi tones of the other sub-dialects indicate a falling contour. These again reveal a contradictory situation. We have to leave this problem unresolved for the time being. It would seem that the Hainan tones have innovations of their own. Tone 5 had probably a falling contour in Proto-Southern Min.

The value of Tone 6 has the following varieties: 22, 33, 24, 42, 53 in Hainan; and 11, 12 in the others. Again, it is difficult to obtain a suitable solution here.

The sandhi tones of Tone 7 are in accordance with the value of Hainan tones. The falling tone 53 in Hainan occurs only when the syllable ends with a glottal stop. We are confident that we shall be able to reconstruct a short tone \*55 for Tone 7.

Although Tone 8 has some different contours among the sub-dialects, the general tendency is easy to observe. Therefore, we posit also a short tone \*11 for this tone.

The tonal system of Proto-Southern Min can be summarized as follows:

1	2	3	4	5	6	7	8
*33	*11	*35	?	(falling?)	?	* <u>55</u>	* <u>11</u>

Among these forms, Tone 1 and Tone 7 agree completely with Hirayama's reconstruction, although we proceeded from different premises.

### 3. Tonal Change from short to long

Scholars of Chinese linguistics probably all agree on the theory that the Ancient Chinese endings -p, -t, -k of checked syllables gradually merged into -k or a glottal stop, and eventually changed to an open syllable by dropping the ending. (cf. Chen 1973). At the same time, the short tone that a checked syllable bears would usually change to a long tone. The most probable direction of this kind of change would be merging with the long tone having a similar or identical contour. This can be proven by the following evidence.

3.1 In the Ch'eng-mai dialect mentioned above, there are two short tones, i.e., 55 for Tone 7 and 33 for Tone 8. Ho (1981: 117) pointed out that in Lung-ch'i, another Southern Min dialect, both Tone 7 and Tone 8 are checked syllables with -p, -t, -k, and -ʔ endings, which regularly correspond to Tone 7 and Tone 8 in the Ch'eng-mai dialect. But among these syllables, those with -ʔ ending changed from a short tone to a long one after this ending had dropped out in the Ch'eng-mai dialect. The contour of Tone 7, therefore, includes a long 55 and a short 55, while Tone 8 includes a long 33 and a short 33. Since there is no high level tone in the Ch'eng-mai dialect, the long 55 is a new tone

in the tonal system. However, since a long mid level tone 33, Tone 4, does exist, Tone 8 syllables having the identical contour naturally mixed with this tone. In order to clarify this statment, let us cite the tonal system of the Ch'eng-mai dialect again:

1	2	3	4	5	6	7	8
22	41	21	33	24	=1	55, <u>55</u> =33, <u>33</u>	

Because of the mixture of the syllables of Tone 4 and a part of Tone 8 in the Ch'eng-mai dialect, originally different syllables in the Lung-ch'i dialect would become homophonous here. For instance:

	Lung-ch'i	Ch'eng-mai
"elephant"	ts'io 33	sio 33
"mat"	ts'io? <u>13</u>	sio 33
"ant"	hia 33	hia 33
"forehead"	hia? <u>13</u>	hia 33

3.2 The tonal change from short to long is sometimes related to the reconstruction of proto-tones. In Yün-nan province, the most prevalent dialect spoken is South-western Mandarin which generally has four tones. Among a hundred and one prefectures, only fourteen places have five tones.<sup>5</sup> In addition to the usual tones 1, 2, 3, and 4, there is a Tone 5 which contains only checked syllables. I chose four prefectures that have the additional Tone 5 to compare with eleven surrounding prefectures that have only four tones. All these sub-dialects are listed in two groups and the geographical position is shown in Map 1. Numerals in parentheses show narrow transcription or alternative pronunciation.

	1	2	3	4	5
	(Yin-p'ing)	(Yang-p'ing)	(Shang)	(Ch'ü)	(Ju)
P1. Lu-liang	44	53	42	24	313(312)
P2. Ch'ü-ching	33(23)	53	42	35(25)	31(312)

5. All material of Yün-nan is cited from S. F. Yang 1969.

Group I	P3. Hsün-tien	44	53	31	13	42
	P4. Chan-yi	44	42	53(54)	35(25)	31(312)
	P5. Hsüan-wei	44(33)	31	53	24(214)	=2
	P6. P'ing-yi	33	31	53	24(214)	=2
	P7. Lo-p'ing	44	31	53	13(14)	=2
	P8. Shih-tsung	44(34)	31(32)	53	13(213)	=2
	P9. Lu-hsi	44	31(41)	53	13(213)	=2
Group II	P10. Lu-nan	44	31(21)	53	24(214)	=2
	P11. Yi-liang	44	42	53	11(21)	=2
	P12. Sung-ming	44	42	53	13(213)	=2
	P13. Lu-ch'üan	44	31(42)	53	313(312, 212)	=2
	P14. Hui-che	55	31	53(54)	24(14)	=2
	P15. Ma-lung	44(33)	42	53	13(213)	=2

It is obvious that Group I, which has five tones, represents a dialect older than Group II, which has only four. Starting from Group II, we can see that Tone 2 and Tone 3 are both falling tones, but relatively speaking, the tone value of the former is lower than the latter. Tone 5 syllables all merged into the low falling tone. Group I indicates two kinds of tonal systems. The first three have the same high falling contour for Tone 2, and Tone 3 is lower. But the fourth one is quite different. Near Group II, Tone 2 is lower than Tone 3 in this dialect, and therefore paves the way for the merger of Tone 5 from short to long.

Within Group I, Tone 5 syllables are pronounced short with a final glottal stop in P1 and P2, but have already changed to a long tone in P3 and P4. Since we know that Tone 5 was originally comprised of checked syllables with final stops in Ancient Chinese, P1 and P2 are thus older dialects representing an unchanged condition in Group I. The evolution of Tone 5 may have two processes:



1) 31→31→42 (or 41) (Tone 2)

2) 31→31→42→53 (Tone 2)

Noting the fact that Tone 2 is always lower than Tone 3 in Group II, we believe that the first process is very likely the true picture. In other words, when a checked syllable dropped its glottal stop ending, its tone would change to a long one and sometimes merge into another tone with similar or identical contour.

With this process in mind, we can posit the following tonal system for the proto-language of these two groups.

1	2	3	4	5
*44	*53	*42	*13	* <u>31</u>

While Tone 2 changed from 53 to 42 or 31, Tone 3 went upwards from 42 to 53. This tonal shift must have taken place before the change of Tone 5, otherwise we cannot explain why Tone 5 eventually merged with Tone 2 rather than with Tone 3.

This is probably a case of flip-flop which may raise some doubts. If we reconstruct in a different way by positing \*42 for Tone 2 and \*53 for Tone 3, we cannot avoid to cope with the same problem in P1, P2, and P3 in Group I, where \*42 would change to 53 and \*53 would change to 42 and 31. Generally speaking, the South-Western Mandarin of Yün-nan province has a tendency that the tone categories are on the decrease from five to four. It is reasonable to consider the five-tone dialects as residues which will eventually change to the four-tone system. Therefore, the values of Tone 2 and Tone 3 in P1, P2, and P3 are very likely reflecting the situation of the proto-language. Although we may have different speculations on the tonal changes from the proto-system to these two groups, the exact process remains unknown.

3.3 Different from the above, checked syllables also exhibit another direction of change. In the Ju-kao dialect of Chiang-su, some of the Tone 6 syllables have the following sandhi forms:

p'i? 35 "other": p'i 11 rən 11 "others"

ri? 35 "day": rei 11 tei 11 "daytime"

- le? 35 "the winter sacrifice": le 11 yu? 11 "the twelfth lunar month"  
 sə? 35 "ten": sə 11 vĕ 11 "hundred thousand"  
 miə? 35 "to exterminate": miə 11 mən 35 tɛ'yu? 35 hu 11 "to exterminate  
 the clan"  
 niə? 35 "to rebel": niə 11 mo 35 "rebels"  
 p'ɔ? 35 "white": p'ɔ 11 y 35 "white fish"  
 mɔ? 35 "ink": mɔ 11 lɔ 11 sə? 44 "a blue-black colour"  
 lɔ? 35 "six": lɔ 11 vĕ 11 "sixty thousand"

Out of ninety-nine Tone 6 morphemes, I found only the above nine which have this kind of sandhi form. The tonal system of Ju-kao is as follows:

1	2	3	4	5	6
( <i>Yin-p'ing</i> )	( <i>Yang-p'ing</i> )	( <i>Shang</i> )	( <i>Ch'ü</i> )	( <i>Yin-ju</i> )	( <i>Yang-ju</i> )
11	35	424	44	<u>44</u>	<u>35</u>

We can see that there is a long tone 35 having the same contour of Tone 6. Yet, Tone 6 changed to Tone 1 instead of Tone 2. This is contrary to the process described above. If we call the first kind of change an example of homogeneous coalescence, the second one would be an example of heterogeneous coalescence. Here, high rising short tone becomes a low level long tone. The rule of homogeneous coalescence applies to the whole class of Tone 5 in Yün-nan, while the rule of heterogeneous coalescence applies only to a small portion of Tone 6 syllables in Ju-kao. However, there are two ways in which a short tone can change to a long tone. We must consider both of these kinds of change when reconstructing a proto-language.

#### 4. Probable origin of the falling-rising tone

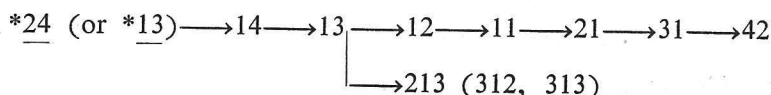
Wang (1967) discussed the evolution of bidirectional tones, including the falling-rising and the rising-falling tones. Since the falling-rising tone occurs more often in Chinese dialects, here I would like to go back to seek out the origin of this marked tone.

In addition to the Yün-nan data listed above in Group I and Group II, let us examine a wider range of materials:

		1	2	3	4	5
Group III	P16. Feng-yi	44	31	42(41)	55(45)	24(14)
	P17. Yün-lung	33	53	31	55	13(12)
	P18. Erh-yüan	44	53	42	24	31(21)
	P19. Chien-ch'uan	44	42(32)	31(41)	55(45)	13(213)
	P20. Teng-ch'uan	44(33)	53(54)	31(41)	35(24)	11(21)
	P21. Pin-ch'uan	33	42	53	13(14)	31
	P22. Yen-hsing	55	53(52)	42(41)	313(213)	31

First, we notice the following varieties of Tone 4 in this group: 55, 45, 35, 24, 14, 13, 313, and 213. It is valid to describe the change from high (35) to low (13), or the other way around. But, the falling-rising 313 or 213 always occurs in the process of change. In Group II, Tone 4 syllables are also pronounced in falling-rising tones, such as 312, 214, 213 and 212. It seems that the proto-tone \*13 shifted upwards on the one hand, and created a falling-rising tone on the other. The latter change is made possible by the addition of a little falling contour to the beginning of a rising tone. At any rate, the falling-rising tone here must have derived from a rising tone, which is reconstructed as a natural result by examining the similar contours of Tone 4 in Groups II and III, no matter how we reconstruct its value.

The second phenomenon worth noticing is the change Tone 5 must have undergone. I have reconstructed a short falling tone \*31 for it (see above). In Group III, two rising tones occurred. It would be unreasonable to consider the rising tones as a later change, because Tone 5 finally merged into Tone 2 which has a falling contour. We are thus forced to change our reconstruction from \*31 to \*24 or \*13 for Tone 5. The process of change may be restated as follows:



Every stage of the change is actually clearly indicated in the data above, and serves to prove again that 213 is derived from a rising tone. Although I have not checked the origin of all the falling-rising tones in Chinese dialects,<sup>6</sup> this pattern is significant for the reconstruction of tones.

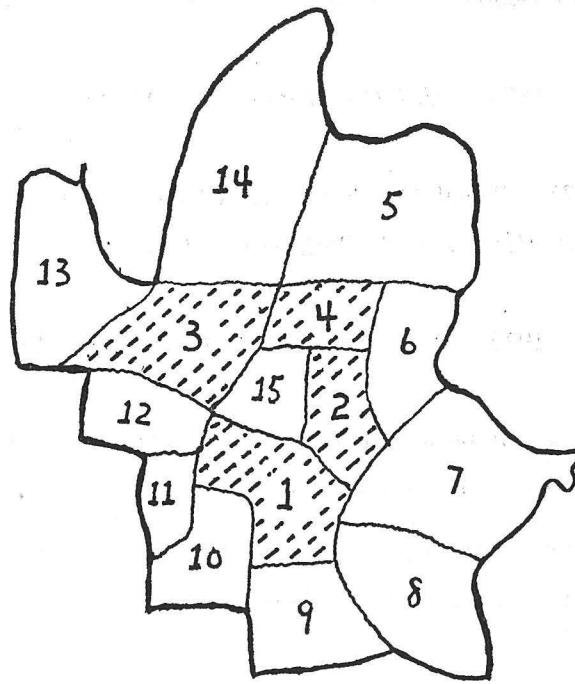
### 5. Conclusion

Three aspects of tonal development in Chinese dialects have been discussed in this paper. By observing these actual changes, we may propose useful methods for reconstructing tone values. For example, I would like to suggest a new explanation for the well known sandhi forms in Mandarin. Tone 3 (214) syllable preceding another Tone 3 changes to Tone 2 (35). If we recognize the "sandhi form" as the proto-tone, \*35 would then be the value of Tone 3 in Proto-Mandarin. As we know the rising tone is very likely the origin of the falling-rising tone in Yün-nan, the Mandarin 214 could also possibly be a change resulting from a rising tone. Both ways of reconstruction point to the same answer: "Mandarin Tone 3 was originally a rising tone."

From the perspective of historical phonology, I have illustrated elsewhere (Ting 1975) that Tone 3 (*shang sheng*) in Ancient Chinese was a high rising tone. Geographically speaking, there are sixteen prefectures around the city of Peking. Tone 3 is pronounced falling-rising in eleven places and rising in five places.<sup>7</sup> Level and falling tone contours do not occur at all for this tone. If the falling-rising tone itself is not a suitable proto-value of Tone 3, the only candidate left is a rising tone. This would coincide with my findings.

6. Another possible origin of the falling-rising tone is a low falling tone. But more study will be required before we can give a detailed description.

7. According to Hopei Pei-ching Shih-fan Hsüeh-yüan 1961, Tone 3 is pronounced falling-rising in the following eleven prefectures: Feng-ning, Luan-p'ing, Shing-lung, Chi-hsien, San-ho, Ta-li, Wu-ch'ing, Ku-an, Chuo-hsien, Lai-shui, and Yi-hsien, and rising only in the following five: An-ts'z, Chuo-lu, Huai-lai, Lung-kuan, and Ch'ih-ch'eng.



- |         |               |          |               |
|---------|---------------|----------|---------------|
| Group I | 1. Lu-liang   | Group II | 5. Hsüan-wei  |
|         | 2. Ch'ü-ching |          | 6. P'ing-yi   |
|         | 3. Hsün-tien  |          | 7. Lo-p'ing   |
|         | 4. Chan-yi    |          | 8. Shih-tsung |
|         |               |          | 9. Lu-hsi     |
|         |               |          | 10. Lu-nan    |
|         |               |          | 11. Yi-liang  |
|         |               |          | 12. Sung-ming |
|         |               |          | 13. Lu-ch'üan |
|         |               |          | 14. Hui-che   |
|         |               |          | 15. Ma-lung   |

Map 1

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# 漢語方言中聲調演變的幾個問題

(摘要)

丁 邦 新

近年來頗有一些人討論古漢語聲調起源的問題，我自己的研究（丁：1981）認為在詩經時代已經具有以音高區別的四個聲調，就和中古音的情形類似；上古的聲調如果從韻尾輔音變來，至少也是諧聲時代的事。中古以後，四個調類由於聲母的清濁及其他因素演變為今日方言中或多或少的聲調，在演變的過程中，有一些實例可以作為我們擬測古調值的幫助。在這篇文章裡提出下列三個有關聲調演變的問題來討論：

一、「變調」即「原調」 傳統的看法認為一個字單念時的調是「本調」，連讀時的調是「變調」，本文藉海南島臨高話的實例來說明，所謂「變調」極可能就是早期的「原調」。這一種內部擬測的方法有時可以應用到相當複雜的方言裡，不過必須和比較擬測法合用，才能更進一步解決問題。本文羅列廈門、龍溪、晉江、潮州、澄邁、樂會、海口、定安、萬寧、文昌等地的閩語調值擬測閩南語的古調。

二、促調變舒調的方向 漢語史中入聲變舒聲是常見的演變，大致入聲韻尾 -p、-t、-k 先合流為 -k，再變為 -ʔ，最後消失。在入聲尾消失的同時，聲調通常也由促變舒。一般來說，入聲字總是變入調值相同或極相似的舒聲調，如海南島的澄邁，及西南官話中雲南的許多方言點；但是也有截然相反的情形，例如如皋方言中的陽入（35），連讀在韻尾消失時，不跟調值相關的陽平（35）合併，反而變為調值低平的陰平調（11）。

三、降升調的來源 從調型看來，降升調是比較不自然的一種。以雲南方言為例，降升調很可能是從升調變來，就是在升調的起頭加上一小段降調所造成的。

根據以上一、三兩點的討論，本文推測國語的上聲調可能是從升調變來，與北平四週的方言比較起來，顯示同樣的方向；跟我以前（丁：1975）從歷史的角度討論四聲調值的結論也是一致的。