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(S. Karger, Basel/New York 1965).

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Some Experiments on Chinese (Mandarin) Tone Sandhi*

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The present paper concerns the phonetic nature of morphophonemic Tone-2 of Mandarin Chinese. It deals with the morphophonemic Tone-2 derived from lexical Tone-3 in sequences of 33 when the second lexical 3 occurs as a neutral tone or Tone-0. Spectrograms of reduplicated forms are used to determine the phonetic nature. The speakers are two women whose first language is Mandarin Chinese.

It is generally said that the phonetic nature of lexical Tone-2 is mid-high and that of lexical Tone-3 is mid-low-high. The phonemic distinction between these two tones is either time or frequency or the "low", which will be called the "dip" in this paper, in Tone-3. It is fairly unknown, however, that spectrograms show that either tone can be longer or shorter than the other in time, either tone can be higher or lower than the other in frequency, and both tones have a dip. The distinctive features can now be described as follows: 1. Tone-3 dips late; Tone-2 dips early. 2. Tone-3 dips more; Tone-2 dips less. 3. Tone-3 rises less from vocalic-start to the end; Tone-2 rises more. (See A for Tone-3 and B for Tone-2.)

In a sequence of two lexical 3's: 33, the first 3 can occur as morphophonemic 2. The sequence is then morphophonemic 23: M23. It has been found that this morphophonemic 2 of M23 also has the same three distinctive features as lexical 2. (See C.) The results of the above study which concerns the phonetic, phonemic,

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and morphophonemic 2 were presented in a paper by the present writer at the First World Congress of Phoneticians in Tokyo, Japan, August, 1960, and the paper was published in *Study of Sounds*, Volume IX (1961), Tokyo, Japan.

In a different context a lexical 3 followed by another 3 can occur as morphophonemic 3 followed by Tone-0: M30. For example: jyejye "elder sister", nainai "paternal grandmother", yangyang "to itch". This M3 of M30 has been described by *Y. R. Chao* and *Samual Martin* to have a dip but with no rise. *Mandarin Reader* describes it as the same as lexical 3, that is, it rises after the dip.

A lexical 3 followed by another 3 can also occur as morphophonemic 2 followed by Tone-0: M20. For example: swoyi "consequently", syaujye "Miss", keyi "can or be able to". This M2 of M20 has been described by *Chao* and *Martin* and in *Mandarin Reader* to have no dip.

This present work is to see if the morphophonemic 2 of M20 has a dip. If it does not, then the M2 of M20 is different from the M2 of M23. If it does, then is it like M3 of M30 or is it like M2 of M23?

Procedure: Minimal pairs of lexical Tone-3 and Tone-2 of the same finals were used, since the above mentioned study has proved that the tone occurs in the "final", that is, somewhere between the vocalic-start and the end.

Spectrograms similar to the following were run, and the 10th harmonics were traced.

1. Lexical 3 followed by "de": M30. Example: syede "written". D shows M3.

2. Reduplicated forms of 3: M30. Example: jyejye "elder sister". E shows M3.

3. Lexical 2 followed by "de": 20. Example: syede "oblique". F shows 2.

4. Reduplicated forms of 2: 20. Example: syesye "babytalk for 'shoes'". G shows 2.

5. Reduplicated forms of 3: M20. Example: syesye "write a bit". H shows M2.

6. Reduplicated forms of 2 in a stream of speech: 20. Example: changchang "taste a bit" in lai 'changchang' hauchr bu hauchr "Come to 'taste a bit' to see if it tastes good or not". I shows 2.

7. Reduplicated forms of 3 in a stream of speech: M20. Example: tangtang "lie down a bit" in shangfeng 'tangtang' jyou hau le "Cold will get well if 'lie down a bit'". J shows M2.

Description

1. Lexical 2 of 20 dips and rises. (See F, G, and I.)
2. M2 of M20 also dips and rises. (See H and J.) This disagrees with the descriptions given by *Chao* and *Martin* and in *Mandarin Reader*.
3. M3 of M30 dips but does not rise. (See D and E.) This agrees with the descriptions given by *Chao* and *Martin* but does not agree with that given in *Mandarin Reader*.

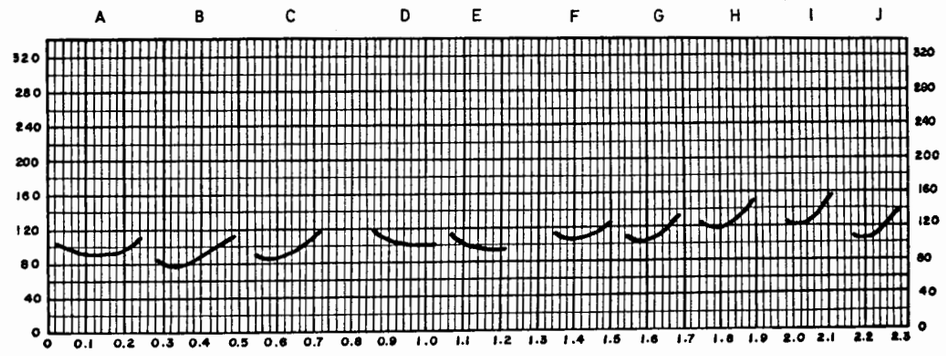

Fig. 1. Spectrographic illustrations.

Analysis

1. M2 of M20 (H and J) is not like Tone-3 in isolation (A).
2. M2 of M20 (H and J) is not like M3 of M30 (D and E).
3. M2 of M20 (H and J) is like Tone-2 in isolation (B).
4. M2 of M20 (H and J) is like 2 in 20 (F, G, and I).
5. M2 of M20 (H and J) is like M2 in M23 (C).

Conclusion: Morphophonemic 2 of M20 derived from 33 dips and rises.

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Discussion

Weingartner (Hamburg): Research on the difference between Chinese tones 2 and 3 showed me no dips in tone 3 and dips in tone 2, especially at morphemes that begin with a vowel (which I write øv = Zero + vowel).

At least for these cases the distinction from a dip might not hold.