

## Explaining a Sound Change in Chinese

Eric Zee    Wai-Sum Lee

ctlzee@cityu.edu.hk    ctlllee@cityu.edu.hk

Phonetics Lab, Department of Chinese, Translation and Linguistics, City University of Hong Kong

### Abstract.

A major sound change in Chinese which is well-documented is that the Middle Chinese, the language codified in an ancient rime dictionary *Qieyun* published in 601 A.D., voiced syllable-initial stops and affricates (*MCVSA*, henceforth) associated with the historical *yang* tones, i.e., low register tones (as opposed to *yin* tones, i.e., high register tones), have developed into aspirated and/or unaspirated reflexes in Modern Chinese after devoicing and the direction of change varies in different dialects (Karlgren, 1915-1926; Pulleyblank, 1969-1970; Sagart, 1986; Norman, 1988).

In Peking dialect, *MCVSA* associated with the *yang ping* (low register level) tone became aspirates, and those associated with the *yang ze* (low register oblique) tones became unaspirates, where \*b stands for *MCVSA*,

\*b (~ *yang ping* tone) > [p<sup>h</sup>] (~ present-day '35' tone)

\*b (~ *yang ze* tones) > [p] (~ present-day '214' and '51' tones)

In Cantonese, *MCVSA* associated with the *yang ping* and *yang shang* (low level rising) tones became aspirates, and those associated with the *yang qu* (low register departing) and *yang ru* (low register entering) tones became unaspirates,

\*b (~ *yang ping* and *yang shang* tones) > [p<sup>h</sup>] (~ present-day '21' and '23')

\*b (~ *yang qu* and *yang ru* tones) > [p] (~ present-day '22' and '2')

In Meixian, a member of the *Kejia* or Hakka dialect family, *MCVSA* associated with any *yang* tones, i.e., low register *ping*, *shang*, *qu*, and *ru* tones, became aspirates,

\*b (~ *yang* tones: *ping*, *shang/qu*, and *ru*) > [p<sup>h</sup>] (~ present-day '11', '51', and '5')

In Changsha, a member of the *Xiang* or Hunan dialect family, *MCVSA* associated with any *yang* tones, i.e., low register *ping*, *shang*, *qu*, and *ru* tones, became unaspirates,

\*b (~ *yang* tones: *ping*, *shang*, *qu*, and *ru*) > [p] (~ present-day '13', '51', '21', and '41')

Historical phonologists and sinologists have tried but failed to explain why (i) *MCVSA* that were associated with a *yang* tone split into aspirates and unaspirates after devoicing, and (ii) why the direction of change varies in different dialects. Rather than exploring the interrelationship between consonant type and tone as a possible explanation, they hypothesized on the phonation types of *MCVSA*, for instance, (i) aspirated voiced, \*b<sup>h</sup> (Karlgren, 1915-1926; Dong, 1980), (ii) voiceless with voiced aspiration, \*p<sup>h</sup> (Pulleyblank, 1969-1970, 1984; Sagart, 1986), and (iii) plain \*b (Luh, 1947; Li, 1982; Wang, 1985; Norman, 1988). However, devoicing of the reconstructed \*b<sup>h</sup> can only explain the *Meixian* case, i.e., \*b<sup>h</sup> > p<sup>h</sup>; and the reconstructed \*b can only explain the *Changsha* case, i.e., \*b > p. As for the reconstructed \*p<sup>h</sup>, according to Pulleyblank and Sagart, it split into aspirates and unaspirates, depending on the tone it was associated with, i.e., \*p<sup>h</sup> ~ *yang ping* tone > p<sup>h</sup>, and \*p<sup>h</sup> ~ *yang ze* tones > p. However, neither has offered explanations considered to be phonetically plausible (details to be presented), and in any case, it can only explain the Peking case.

This study offers an explanation that accounts for the multi-directional change of *MCVSA* after devoicing with the assumption that the sound change in question was phonetically motivated. The explanation is based on the premise that it is physiologically difficult, if not impossible, for a low tonal onset to be produced immediately after a voiceless unaspirated stop or unaspirated affricate, due to antagonism between the two opposing states of phonatory mechanism, one for the production of a voiceless unaspirated stop and the other for the production of a low tonal onset. Given that a *yang* tone with a lower tonal onset must be maintained at the time of devoicing of *MCVSA*, the solution would be to delay the vowel onset, and in order for this to happen, aspiration came into play, creating a buffer zone allowing adjustment of the state of phonatory mechanism for [p] (< \*b) to that of a lower tonal onset. Thus, \*b (~ a *yang* tone with a lower tonal onset) turned into [p<sup>h</sup>], whereas \*b (~ a *yang* tone with a higher tonal onset) turned into [p]. In the latter case, adjustment was unnecessary.

The paper details the laryngeal mechanisms for the production of stop consonants and tone and relates them to the diachronic change of *MCVSA*, and in support of the explanation, experimental data on the relationship between consonant type and F<sub>0</sub> are presented. [End]

## **References**

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