

# A phonological (not phonetic) analysis of intervocalic obstruent lenition in Mandarin

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## 1. Introduction

Due to the Chinese philological tradition, Chinese phonology often focuses on stable phonological structures in monosyllables. However, the concatenation of these latter in plurisyllabic words gives rise to phonotactic phenomena such as syllable weight change, tone sandhi, but also the lenition of intervocalic consonants (or “consonant reduction”).

Mandarin intervocalic lenition has few mentions in the literature (Chao 1968; Xu 1980; Duanmu 2007) and is considered so far as a phonetic phenomenon of connected speech. In this contribution I will argue that on the contrary, it is a phonological phenomenon conditioned by the syllable structure and stress.

## 2. Previous observations

Duanmu (2007: 298-299) notes the phenomenon and makes some preliminary phonetic observations without seeking an explanation:

- (1) a. [p, t, k, tʂ] → [b, d, g, dʒ]  
[li-pa] → [li-ba] ‘fence’  
[ti-ti] → [ti-di] ‘younger brother’  
[kʰ-kʰ] → [kʰ-gə] ‘older brother’  
[kan-tʂə] → [kan-dʒə] ‘do ASP (doing it)’  
b. [ʂ, x<sup>w</sup>, ɕ] → [z, w, j]  
[pau-ʂaŋ] → [pau- zə] ‘in the newspaper’  
[ɕau-x<sup>w</sup>o-tʂ<sup>h</sup>ʰ] → [ɕau-wo-tʂ<sup>h</sup>ʰ] ‘small train’  
[waŋ-ɕan-ʂəŋ] → [wā-jā-zə] ‘Wang mister (Mr. Wang)’  
c. [k, tʂ, tʂ<sup>h</sup>] → [ɣ, z, z]  
[kaŋ-kaŋ-tɕ<sup>hw</sup>y] → [kā-yā-tɕ<sup>hw</sup>y] ‘just went’  
[pu-tʂz-tau] → [pu-z-tau] ‘don’t know’  
[ʂəŋ-tʂ<sup>h</sup>an-can] → [ʂə-zā-can] ‘production line’

For him, the intervocalic lenition “seems to be easier in the second position of a trisyllabic expression” and “is harder in a disyllabic expression” (except for those with neutral tone on the second syllable as in 1a). He then points out that the reduction of aspirated obstruents [p<sup>h</sup>, t<sup>h</sup>, k<sup>h</sup>, ts<sup>h</sup>, s, f] is hard to be found, which will be considered below.

## 3. Corpus

This contribution is not a corpus-driven study, but corpus is helpful to give some insight of the understanding of the phenomenon. Mandarin Chinese has 17 initial obstruents, I compile a list of 17x2=34 words based on the reference dictionary of Standard Chinese, *Xiandai Hanyu Cidian*, structured as follows: the part 1A consists of 17 disyllabic words with an obstruent as the onset of the second syllable [XY] where X and Y stand for monosyllabic morphemes, the part 1B adds to each of 1A words a third monosyllabic morpheme at the right, giving trisyllabic words or phrase having [XY]Z structure<sup>1</sup>. These words are read to 2 native speakers of Mandarin with intervocalic lenition of the second onset. The native speakers should answer if they accept or not the pronunciation. In (2) are shown three examples of the corpus.

- (2) a.i [tʂəŋ ts<sup>h</sup>an] → [tʂə ts<sup>h</sup>an] ‘Chinese food’  
ii [tʂəŋ ts<sup>h</sup>an kuan] → [tʂə zā kuan] ‘Chinese restaurant’  
b.i [tʂ<sup>w</sup>aŋ t<sup>h</sup>ou] → [tʂ<sup>w</sup>ɑ̃ t<sup>h</sup>ou] ‘bedside’  
ii [tʂ<sup>w</sup>aŋ t<sup>h</sup>ou k<sup>w</sup>ei] → [tʂ<sup>w</sup>ɑ̃ dō k<sup>w</sup>ei] ‘bedside table’  
c.i [jen tɕou] → [jɛ tɕou] ‘research’

<sup>1</sup> As an ongoing work, a part 2 of the corpus is under construction, with an obstruent as the onset of the first syllable of [XY], and an added third monosyllabic morpheme at the left, giving Z[XY] structure.

- ii. [jen tɛou s<sup>w</sup>o:] → [jẽ jo s<sup>w</sup>o:] ‘research centre’

Contrary to Duanmu’s claim, both two native speakers accept lenis forms in (2a-ii), (2b-ii) and (2c-ii), aspirated obstruents or not, and refuse to have lenition in (2a-i), (2b-i) and (2c-i).

#### 4. Phonological analysis

Three observations can be made on the intervocalic lenition: 1) the onset of the second syllable of a disyllabic word resist to lenition unless 2) this second syllable has a neutral tone or loses its lexical tone by de-stressing; 3) the onset of the second syllable of a trisyllabic word or phrase is the target of the lenition, that of the third syllable is not. This can be sketched in the following table.

Distribution	Lenition
#__V <sub>1</sub>	No
#CV <sub>1</sub> .__V <sub>2</sub> #	No
#CV <sub>1</sub> .__V <sub>2</sub> # (V <sub>2</sub> has no tone)	Yes
#CV <sub>1</sub> .__V <sub>2</sub> .CV <sub>3</sub> #	Yes
#CV <sub>1</sub> .CV <sub>2</sub> .__V <sub>3</sub> #	No

According to Yue-Hashimoto (1987), Mandarin Chinese is among languages dominated at the right. Liu (2008) shares the same view that non-final syllables are relatively short in Mandarin. Luo (2013) claims that the length of final syllable is phonological, while de-stressed final syllable is phonologically short as non-final syllables and neutral-tone functional words. The same behaviour of the non-final second syllable onset (1bc) and that of the final neutral-tone syllable (1a) follows from this claim. Yue-Hashimoto (1987) also highlights that the final syllable in Mandarin has a stress. The stress in Mandarin is ambiguous (Chao 1968; Hoa 1983; Liu 2008). By admitting its existence, following the linearisation of stress (Ségéral & Scheer 2008), in CVCV framework, stress should be translated into space inserted on the left of the syllable, giving rise to virtual length (dotted line) having the same representation as in word initial position (3ab, [ON]<sub>i</sub> for initial CV, [ON]<sub>a</sub> for CV of the stress).

- (3) a. word initial      b. word final with stress      c. internal syllable with stress
- [O N]<sub>i</sub> O N      [O N]<sub>a</sub> O N O N      [O N]<sub>a</sub> O N
- c v                      c v                      c v
- 

The hypothesis of stress in Mandarin also accounts for trisyllables with final neutral tone where internal onset is preserved from lenition, regardless of the internal structure of the word. Consider (4) with neutral tone on final [tsi] that cannot bear the stress, this latter goes onto the penultimate syllable and gives the space inserted on the left (3c), [x] and [tɛ] resist to lenition even in the second position of a trisyllable, compared to (1bc) and (2).

- (4) a. [tɛau x<sup>w</sup>a tsi] → [tɛo x<sup>w</sup>a tsi] ‘beggar’
- b. [pau tɛau tsi] → [pɔ tɛo tsi] ‘make raviolis’

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