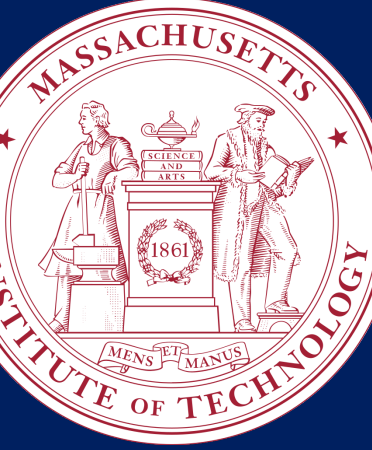


Pre-nuclear Glide in Mandarin Chinese: Is It a Segment?

Boer Fu

Massachusetts Institute of Technology



Overview

- There is a debate on whether the pre-nuclear glide is a segment in Mandarin Chinese or not.
 - I argue that the glide is an independent segment.
 - Evidence is drawn from an exception to the phonotactics constraint *pw.
 - Preliminary findings from a language game experiment that tests adult Mandarin speaker segmentation
- Significance:**
- The Mandarin pre-nuclear glide proves to be a challenge for segmentation learning.

What Is the Glide?

- Pre-nuclear glides: j, w, ɥ between onset and vowel
- Segmenthood debate:

(1) Hypothesis and syllable transcription

Secondary articulation of onset (Duanmu 2000)	C ^G V
Independent segment (Lin 1989)	CGV
Natural CV transition (Ladefoged & Maddieson 1996)	CV

Exception to *pw Constraint

- /w/ can freely combine with most onsets.

(2) Velar onset	ka	kan	kaŋ	ken	kə
	kwa	kwan	kwaŋ	kwen	kwo

- But not usually with bilabial onsets: *pw

(3) Bilabial onset	pa	pan	paŋ	pen	(pə)
	*pwa	*pwan	*pwaŋ	*pwen	pwo

- [pwo] often transcribed as [po] in the literature
- Different from French *peau* ‘skin’, with an audible glide.
- Dialectal variation: [pwo] ~ [pə].
- No Mandarin dialect has /pwo/ vs. /pə/ contrast.

Email: boerfu@mit.edu
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Selected References: Duanmu, S. 2000. The phonology of Standard Chinese. Gouskova, M. & J. Stanton 2021. Learning complex segments. Ladefoged, P. & I. Maddieson 1996. The sounds of the world’s languages. Lin, Y. 1989, Autosegmental treatment of segmental processes in Chinese phonology. Sagey, E. 1986. The representation of features and relations in non-linear phonology.

Difference in Coarticulation

- Observation:** Degree of onset-glide coarticulation differs between velars and bilabials.
- In kw-initial syllables, lip rounding and lip protrusion begin as early as the closure of the velar stop.
 - In pw-initial syllables, there is no rounding coarticulation.
 - Labials are [-round] in Mandarin (Duanmu 2000).
 - Same articulator cannot be both [-round] and [+round] at the same time (Sagey 1986).

Updated Transcription: [k^wwo], [pwo], [k^wwa], *[pwa]

OT Analysis

[+ROUND]-2X: The feature [+round] has to be realized over the span of 2 timing slots/segments.

*p^w: Bilabial onsets cannot be [+round].

(4) /kwa/	*p ^w	[+ROUND]-2X	MAX	[+ROUND]-3X
a. [kwa]		*!		*
b. [k ^w wa]				*
c. [k ^w a]		*!	*	*
d. [ka]			*!	

(5) /pwa/	*p ^w	[+ROUND]-2X	MAX	[+ROUND]-3X
a. [pwa]		*!		*
b. [p ^w wa]	*!			*
c. [p ^w a]	*!	*	*	*
d. [pa]			*	

(6) /kwo/	*p ^w	[+ROUND]-2X	MAX	[+ROUND]-3X
a. [kwo]				*!
b. [k ^w wo]				
c. [k ^w o]			*!	*
d. [ko]		*!	*	

(7) /pwo/	*p ^w	[+ROUND]-2X	MAX	[+ROUND]-3X
a. [pwo]				*
b. [p ^w wo]	*!			
c. [p ^w o]	*!		*	*
d. [po]		*!	*	

Alternative Segmentation

- The analysis of [pwo] crucially depends on [w] being an independent segment.
- Alternative segmentation cannot predict all 4 outputs.
Alternative 1: C^wV across the board: k^wa, k^wo, p^wo, *p^wa
Alternative 2: CwV across the board: kwa, kwo, pwo, *pwa
Alternative 3: k^wV, but pwV: k^wa, k^wo, pwo, *pwa
- None of the above can account for [k^wwa] vs. *[pwa].

Learning Problem

- Mandarin’s shortage of segmental morphophonological alternation makes segmentation learning difficult.
- Gouskova & Stanton’s (2021) *CompSeg Learner*, an algorithm based on co-occurrence probability of two neighboring sounds, fails to learn /w/ as a segment.
- We also do not know what segmentation adult Mandarin speakers actually learned.

A Language Game

- Mandarin speakers tasked with swapping the onsets of a disyllabic word, in the guise of codeword encryption.

(8) *hai nan* ‘Hainan’ → *nai han*

- A syllable is forcefully taken apart, displaying how the glide is segmented by the adult speaker.

(9) Possible codewords of *dian bao* ‘telegraph’

Answer	Pinyin	Segmentation	Hypothesis
CG Ans	<i>ban diao</i>	/tʃan/	Secondary articulation
GV Ans	<i>bian dao</i>	/tʃjan/	Independent segment
GG Ans	<i>bian diao</i>	/tʃjan/	Both of the above

- Preliminary results from 10 Mandarin speakers:
- For items with non-palatal onsets and /j/ glide: *dian*
 Speakers overwhelmingly provide GV answer.
- For items with palatal onsets and /j/ glide: *xia*
 4 speakers chose CG, 4 speakers chose GG.
- Glide segmentation varies by onset place of articulation.
- Within-speaker consistency, between-speaker variation