DEPARTMENT OF LINGUISTICS

Utterance-final high vowel diphthongization in Chongqing Mandarin

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Phonology of Chongqing Mandarin

Chongqing Mandarin (a dialect of Mandarin spoken in Southwestern China)

Syllable template: (C)(G)V(X)

- C: consonant onset
- G: glide [i̯], [u̯], [y̯]
- V: vowel nucleus
- X: ending sound; nasal or [i, u]

Falling sonority in VX

‘Yunmu’ (G)V(X) in Chongqing Mandarin

V	GV	VX	GVX
i ɨ		in	
u ʊ			
y		yn	
e	i̯e u̯e y̯e	ei ən	u̯ei u̯ən
o	i̯o u̯o	ʂu oŋ	i̯ʂu i̯oŋ
a	i̯a u̯a	ai au an ɑŋ	u̯ai i̯au i̯ɛn y̯ɛn u̯an i̯ɑŋ u̯ɑŋ

Moraity

- Non-moraic:
  - (C)
  - (G): glide [i̯], [u̯], [y̯]
- Moraic:
  - V: vowel nucleus – all short
  - (X): ending sound; nasal or [i, u]

‘Yunmu’ (G)V(X) in Chongqing Mandarin

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u ʊ			
y		yn	
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a	i̯a u̯a	ai au an ɑŋ	u̯ai i̯au i̯ɛn y̯ɛn u̯an i̯ɑŋ u̯ɑŋ

Vowel inventory

- Six vowel phonemes: /i/, /y/, /u/, /e/, /o/, /a/
- a minimal ‘sextuplet’:

  li^{31} ‘pear’ ly^{31} ‘donkey’ lu^{31} ‘six’ lo^{31} ‘to fall’ le^{31} ‘rib’ la^{31} ‘spicy’

- High vowels:

  /i/: [i]

  [ɻ̩] after /ts/, /tsʰ/, /s/, /z/

  /y/: [y]

  /u/: [u]

  [ʊ]~[ụ] after /f/, /v/

On the apical vowel ɹ̩

[t͡sɹ̩^{35}.t͡ɕin^{33}] ‘funds’ [tʰə̩u^{33}.t͡sɹ̩e̞^{35}] ‘to invest’

- A vowel, syllabic, despite its transcription
- [sɹ̩] sounds like [sz̩] but less friction
- Allophone of /i/ after /ts/, /tsʰ/, /s/, /z/
- Orthography: [ɹ̩]<i>, identical to [i]<i> [sɹ̩.miɪ] <simi> ‘Smith’
- Phonologically high

Today's topic

(1)

Utterance-medial		Utterance-final **diphthongized**	
[pi^{33}.xo^{31}]	'pen case'	[mau^{33}.piɪ^{31}]	'writing brush'
[ly^{34}.zən^{31}]	'female'	[mei^{34}.lyɪ^{42}]	'beauty'
[t͡sɻ̩^{35}.t͡ɕin^{33}]	'funds'	[tʰə̩u^{33}.t͡sɻ̩ɐ̯^{35}]	'to invest'
[fʊ^{22}.muo̯^{42}]	'parents'	[i̯ɑŋ^{34}.fʊo̯^{21}]	'foster father'
[su^{35}.t͡sə̯u^{33}]	'Suzhou (city)'	[t͡ɕi̯ɑŋ^{35}.suo̯^{33}]	'Jiangsu (province)'

Data: sentence-level utterance

(2)

fʊ.mu　　tʰə̰u^{33}.t͡sɻɻ̩^{35}.

　*muo̰

Parents　　invest

Parents invest.

Data: not diphthongized

(3)

- Non-high monophthongs

  [pe^{31}] ‘white’; [k^{h}o^{213}] ‘class’; [pa^{31}] ‘eight’

- a vowel in a closed syllable

  [ɕin^{35}] ‘heart’

- the second part of an underlying diphthong

  [pai^{213}] ‘failure’

‘Yunmu’ (G)V(X) in Chongqing Mandarin

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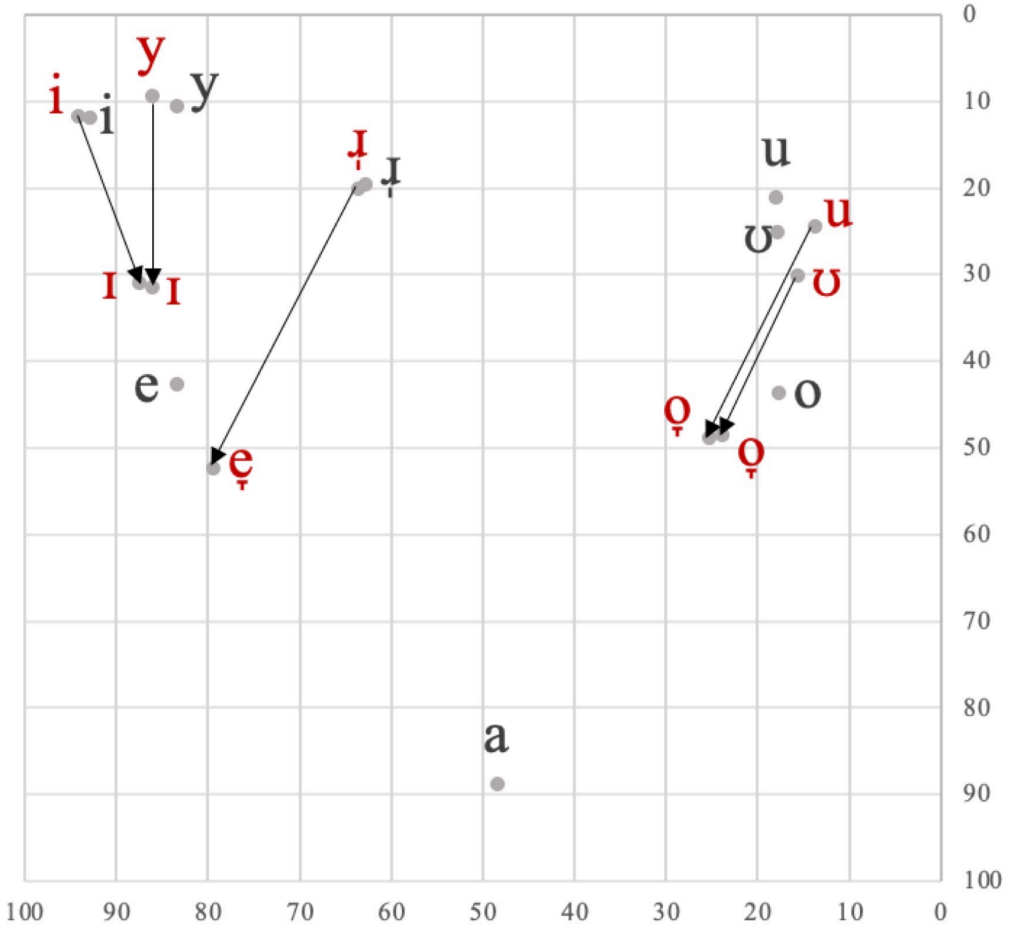
u ʊ			
y		yn	
e	i̯e u̯e y̯e	ei ən	u̯ei u̯ən
o	i̯o u̯o	ə̯u oŋ	i̯ə̯u i̯oŋ
a	i̯a u̯a	ai au an ɑŋ	u̯ai i̯au i̯ɛn y̯ɛn u̯an i̯ɑŋ u̯ɑŋ

Acoustics



- high vowels: [i, y, ɨ, ʉ, u] as monophthongs
- second part of the diphthongized vowel
  - lower than the high vowels acoustically
  - → phonological [-high]
  - centralized towards [ə]
  - → least sonorous in the V inventory

red: 5 diphthongized vowels

black: monophthongs (5 non-final high vowels & 3 non-high vowels)

Summary

i → iɪ

y → yɪ

ɻ → ɻẹ

ʊ → ʊọ

u → uọ

/ (C)__]$_{\text{utterance}}$

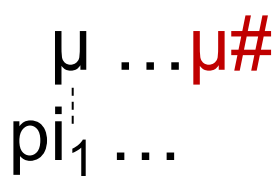
↑

nucleus

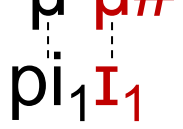
1. boundary floating moras make them bimoraic

- Fission, rather than epenthesis
- a floating mora at the right edge of every utterance, which needs association

- Utterance-medial



- Utterance-final



1. boundary floating moras make them bimoraic (cont.)

- Fission, rather than epenthesis
- a floating mora at the right edge of every utterance, which needs association

- High vowels undergo diphthongization utterance-finally

μ μ# pi$_1$	*FLOAT	INTEGRITY
μ μ# pi$_1$	*!	
μ μ# ☞pi$_1$ɪ$_1$		*

2. boundary moras gain different quality

- high vowels do not fission into identical parts due to an undominated OCP constraint

- bans other [+high][+high]:

  [liə̯u i̯o] *[li̯u i̯o] ‘New York’

  *i̯u *u̯i *y̯u *y̯i *ui *iu

- bans identical high vowels

  *ii *yy *ɻɻ *ʊʊ, *uu

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a	i̯a u̯a	ai au an ɑŋ	u̯ai i̯au i̯ɛn y̯ɛn u̯an i̯ɑŋ u̯ɑŋ

2. boundary moras gain different quality

- high vowels do not fission into identical parts due to an undominated OCP constraint

μ μ# pi_1	*[+hi][+hi]	*FLOAT	INTEGRITY
μ μ# pi_1 i_1	*!		*
μ μ# ☞pi_1 i_1			*

3. deriving quality of boundary moras

i → iɪ

y → yɪ

ɻ → ɻẹ

ʊ → ʊọ

u → uọ

- Minimally different: [+high] → [-high]

  all other FAITHFULNESS ≫ IDENT(high)

- Evidence for fission, rather than epenthesis

μ μ# pi_1	IDENT(low)	IDENT(high)
μ μ# pi_1 a_1	*!	*
μ μ# ☞pi_1 $ɪ_1$		*

Eliminating potential candidate: Falling sonority in VX

- Why [iɪ]#, not *[ɪi]# ?
- Reduce the second part, not the first

- prominence alignment (Crosswhite 2004)

Scale 1: Syllabic prominence

peak > margin

Scale 2: Segmental prominence (sonority)

a > e, o > i̇, u, y, ɻ, ʊ > ɪ, o̝, e̝ > r > n, m, ŋ > etc.

[ə] as the least sonorous vowel

[ɪ, o̝, e̝] are all centralized

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u ʊ			
y		yn	
e	i̯e u̯e y̯e	ei ən	u̯ei u̯ən
o	i̯o u̯o	ə̯u oŋ	i̯ə̯u i̯oŋ
a	i̯a u̯a	ai au an ɑŋ	u̯ai i̯au i̯ɛn y̯ɛn u̯an i̯ɑŋ u̯ɑŋ

Eliminating potential candidate: prominence alignment (cont.)

- Why [iɪ]#, not *[ɪi]# ?
- Reduce the second part, not the first

Falling sonority in VX, modelled by a set of ‘prominence alignment (PA)’ constraints:

μ μ# pi_1	PA	*FLOAT	INTEGRITY
μ μ# $pɪ_1$ i_1	*!		*
μ μ# ☞pi_1 $ɪ_1$			*

Restricting diphthongization

- High vowels undergo diphthongization utterance-finally
- non-high vowels do not

μ μ# pa$_1$	INT(–hi)	*FLOAT	INT(+hi)
μ μ# ☞pa$_1$		*	
μ μ# pa$_1$ V$_1$	*!		

Restricting diphthongization (cont.)

- Syllables that are underlyingly bimoraic like [pai] and [ɕin] cannot host floating moras

μμ μ# ɕi$_1$n$_2$	*superheavy	*FLOAT	INTEGRITY
μμ μ# ☞ɕi$_1$n$_2$		*	
μμ μ# ɕi$_1$n$_2$ X$_2$	*!		*

Restricting diphthongization (cont.)

- Syllables that are underlyingly bimoraic like [pai] and [ɕin] cannot host floating moras

μμ μ# pa_1i_2	*superheavy	*FLOAT	INTEGRITY
μμ μ# ☞pa_1i_2		*	
μμ μ# pa_1i_2 V_2	*!		*

Conclusion: /pi/# → [piɪ]#

- Boundary floating moras are associated

  *pi #

- OCP constraint bans [+high][+high] sequences

  *pii #

- Only minimal difference is tolerable

  *pie # *pię # *pin #

- Prominence alignment leaves the lowered part at the less prominent position

  *pɪi #

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