UNIVERSITY OF CAMBRIDGE

Polysyllabic tone sandhi and morphosyntax in Xiangshan Wu Chinese

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Background: Tone sandhi

- ***Directionality of tone sandhi across Chinese languages:***
  - ***Right-dominant:*** the right tone is preserved, and the left tones undergo changes
    e.g., in Mandarin: 213 → 35 / __ 213
  - ***Left-dominant:*** the opposite
    e.g., in Chengdu, 45 → 44 / T__

Dominance: tonal preservation

- ***Bi-directionality and its connection with morphosyntax in Northern Wu Chinese***

Left-dominant: most words & phrases

	tsʰɔ	*vɛ* 炒饭 *'fried rice'*	**NP**
Citation tones	34	13	
Tone deletion	34		
Tone spreading	3	4	

Right-dominant: Verb-Object, Subject-Object, etc.

	tsʰɔ	*vɛ* 炒饭 *'to fry rice'*	**VP**
Citation tones	34	13	
Tone reduction	44	13	

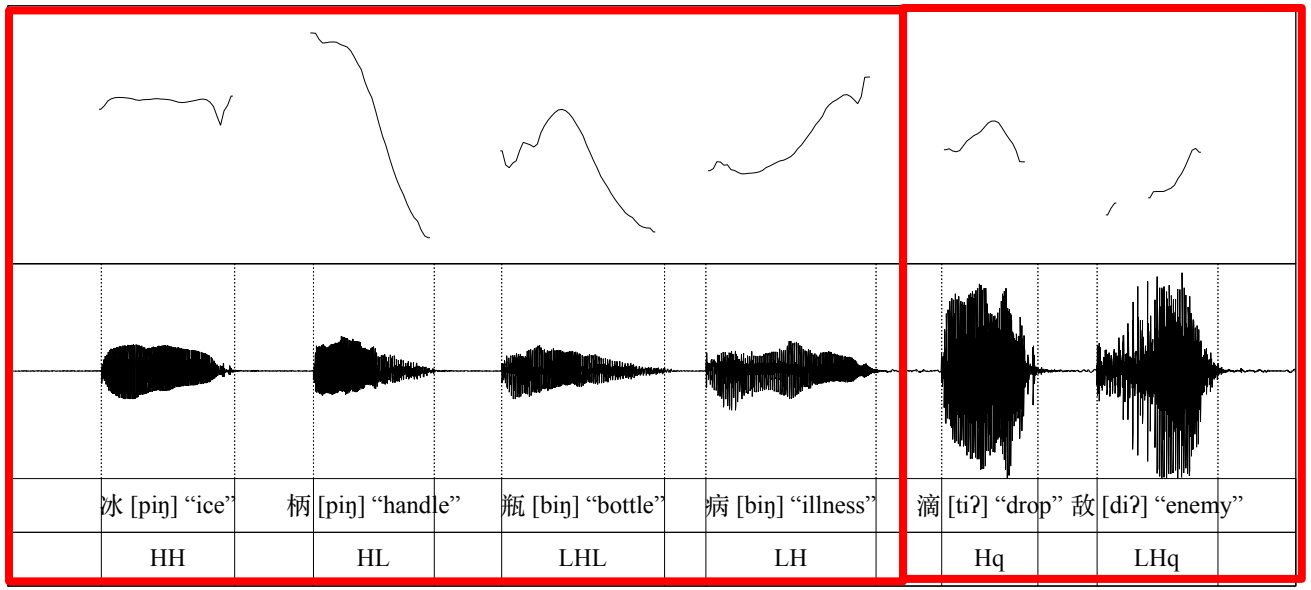
(data source: Xu et al. 1981; autosegmental analysis: Chen 2000)

Background: Xiangshan (象山)

- Xiangshan dialect: an under-studied Northern Wu dialect

Background: Tone system in Xiangshan Wu

- ***6 tones in total***
- HH, HL, LHL, LH, Hq, LHq
- Checked tones: Hq, LHq
  - Glottal stop ending
  - Shorter syllables
- Non-checked tones: HH, HL, LHL, LH



Scope of today's talk

- ***Disyllabic sandhi***
  - whether the two sandhi mechanisms (left- & right-dominant sandhi) also co-exist in Xiangshan

- ***Trisyllabic sandhi***
  - how tone sandhi appears in more complex morphosyntactic environments
  - two 2+1 structures with an asymmetry of sandhi patterns

Data elicitation & analysis

- ***Speakers***
- 8 native Xiangshan speakers
- 4 female, age range: 47-53, mean age: 50

- ***Stimuli***
- ***Tones:*** LHL-initial non-checked tone combinations
  - ***Disyllables:*** all 4 possible combinations
  - ***Trisyllables:*** only tone sequences consisting of HH & LHL

Disyllables	***Trisyllables***
LHL—HH;	*LHL—HH—HH;*
LHL—HL;	*LHL—HH—LHL;*
LHL—LHL;	*LHL—LHL—HH;*
LHL—LH	*LHL—LH—LHL*

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- ***Tones:*** LHL-initial non-checked tone combinations
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- ***Morphosyntactic structures:***
  - ***Disyllables:*** lexical compounds, Modifier-Head phrases, Verb-Object phrases
  - ***Trisyllables:*** two 2+1 structures; [[V N] N] & [[A N] N]

*Examples with **LHL-HH** citation tones*
Lexical compound: 黄瓜 [yellow melon] 'cucumber'
Modifier-Head phrase: 黄花 'yellow flowers'
Verb-Object phrase: 卖花 'sell flowers'

*Examples with **LHL-HH-LHL** citation tones*
[[V N] N]:卖花人 [[sell flower] people] 'people who sell flowers'
[[A N] N]: 黄瓜皮 [[yellow melon] skin] 'cucumber skin'

Data elicitation & analysis

- ***Speakers***
- 8 native Xiangshan speakers
- 4 female, age range: 47-53, mean age: 50

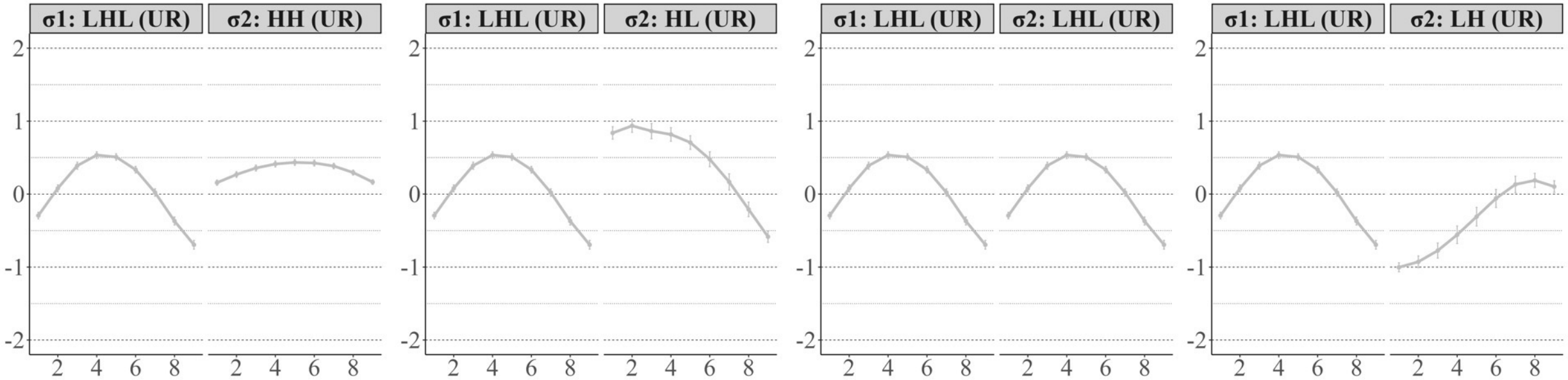
- ***Data extraction:*** F0 at 10 equidistant measurement points for each rhyme
- ***Data normalisation:*** log-z-score normalised within each speaker

- ***Stimuli***
- ***Tones:*** LHL-initial non-checked tone combinations
  - ***Disyllables:*** all 4 possible combinations
  - ***Trisyllables:*** only tone sequences consisting of HH & LHL
- ***Morphosyntactic structures:***
  - ***Disyllables:*** lexical compounds, Modifier-Head phrases, Verb-Object phrases
  - ***Trisyllables:*** two 2+1 structures; [[V N] N] & [[A N] N]

Results: disyllabic sandhi patterns

- ***Lexical compounds & Modifier-Head phrases***

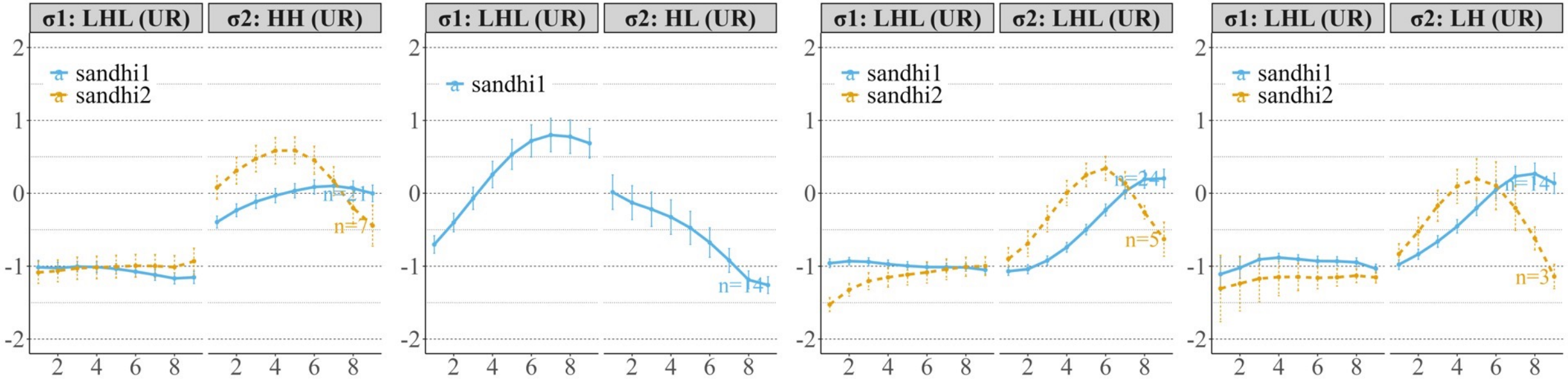
  4 citation tone combinations: LHL-initial



Results: disyllabic sandhi patterns

- ***Lexical compounds & Modifier-Head phrases***

Sandhi outputs



Note: sandhi1 and sandhi2 are random variants of sandhi outputs that do ***NOT*** correlate with speakers or items

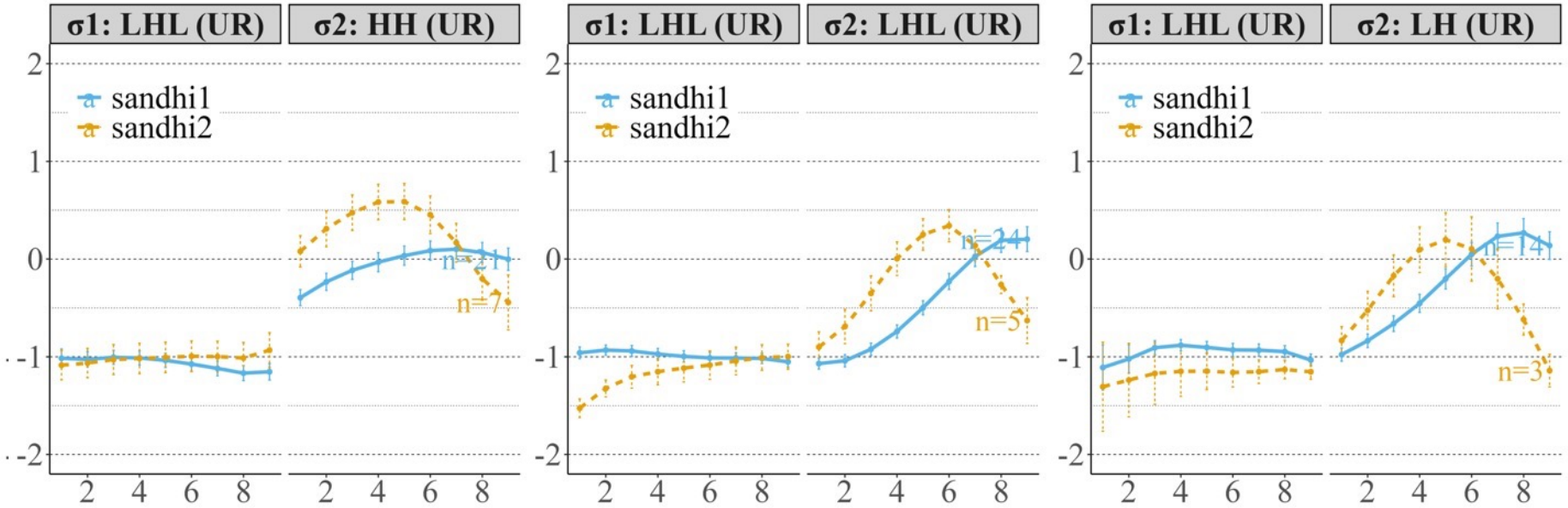
Results: disyllabic sandhi patterns

- ***Lexical compounds & Modifier-Head phrases***

Sandhi outputs

Left-dominant pattern

LHL + T → L + LH/LHL

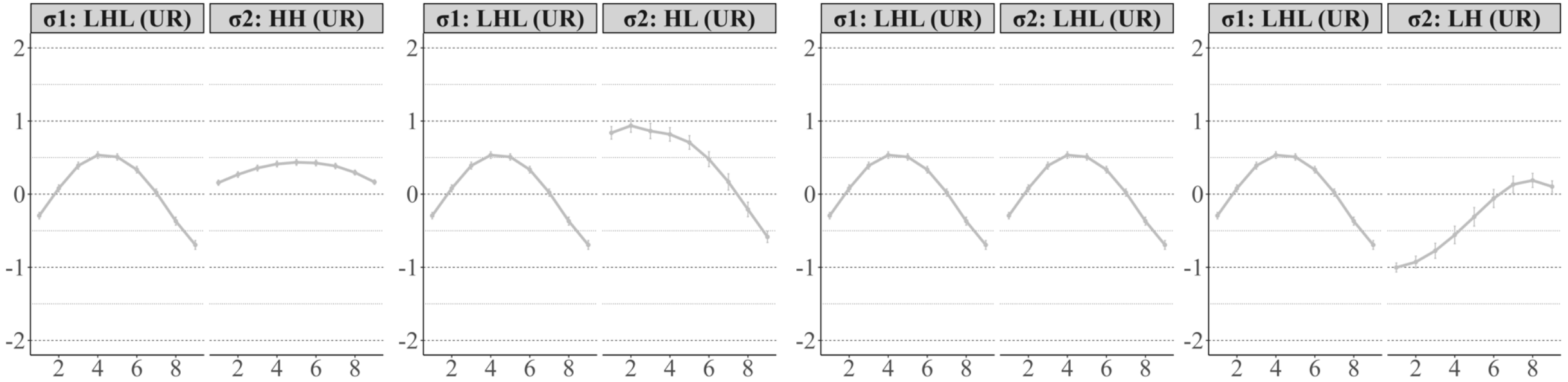


Note: sandhi1 and sandhi2 are random variants of sandhi outputs that do ***NOT*** correlate with speakers or items

Results: disyllabic sandhi patterns

- ***Verb-Object phrases***

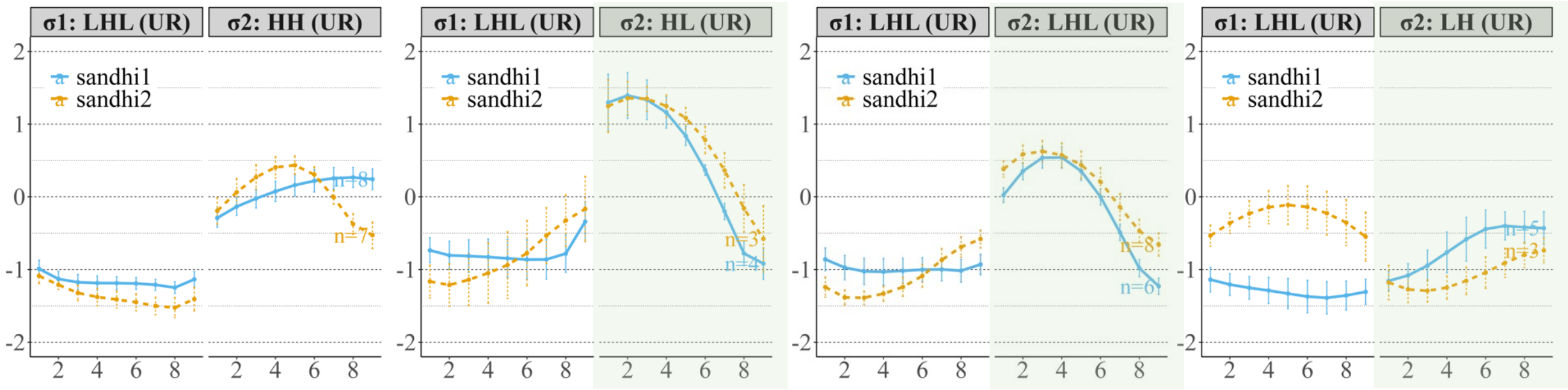
Again, 4 possible citation tone combinations



Results: disyllabic sandhi patterns

- ***Verb-Object phrases***

Sandhi outputs *Right-dominant pattern* LHL + T → L/LM/LML + T



Results: disyllabic sandhi patterns

- ***Lexical compounds & Modifier-Head phrases*** ***(left-dominant)***

	σ_1	σ_2
Citation tones	LHL	T
Neutralization	L	LH/LHL

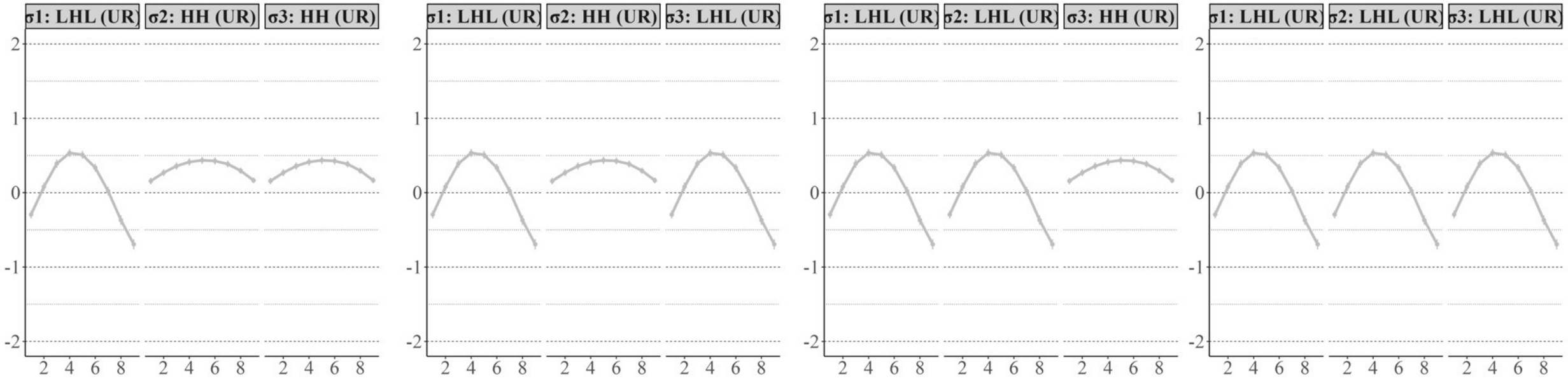
- ***Verb-Object phrases*** ***(right-dominant)***

	σ_1	σ_2
Citation tones	LHL	T
Reduction	L/LM/LML	T

Results: trisyllabic sandhi patterns

- ***[[A N] N]***

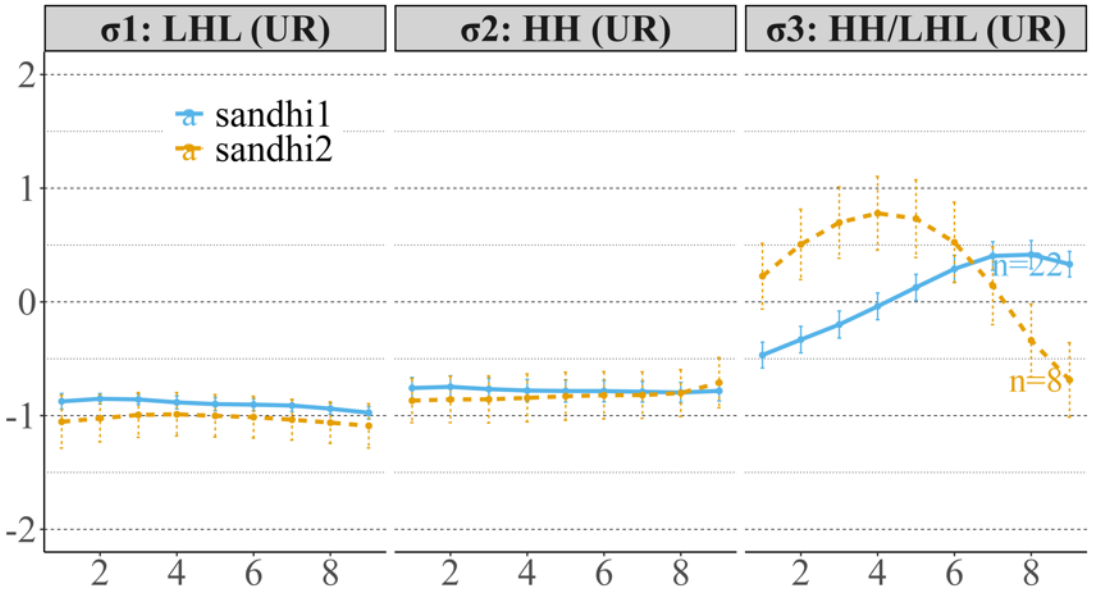
4 citation tone sequences: (1) LHL-initial; (2) only consisting of LHL & HH



Results: trisyllabic sandhi patterns

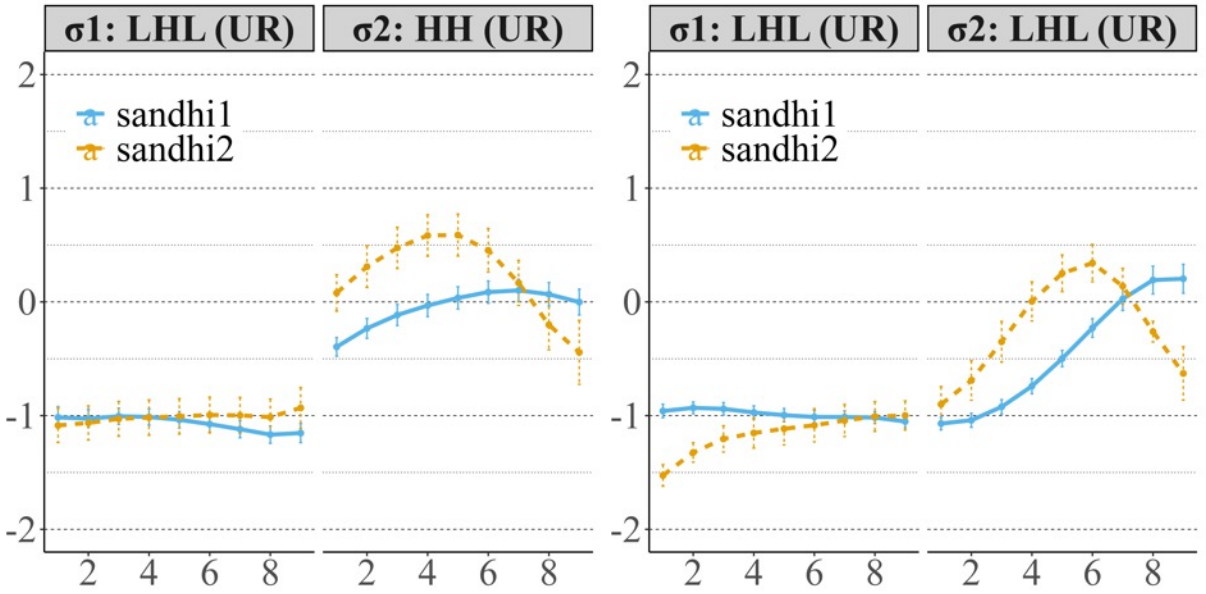
- ***[[A N] N]***

All tone combinations neutralized to ***the same*** sandhi contours



An extension of the left-dominant pattern

$LHL + T_1 + T_2 \rightarrow L + L + LH/LHL$



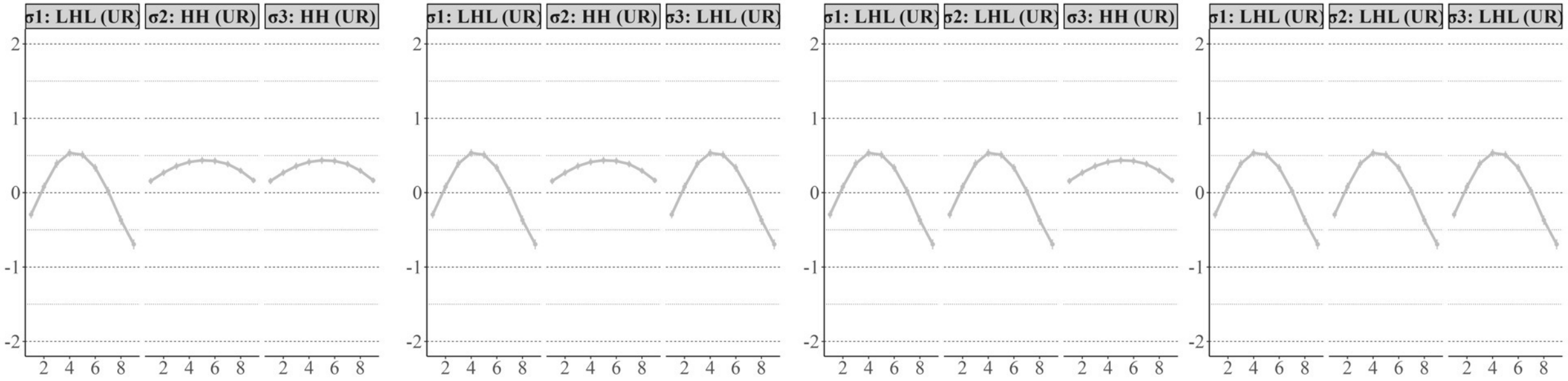
Recall: disyllabic ***left-dominant*** patterns

$LHL + T \rightarrow L + LH/LHL$

Results: trisyllabic sandhi patterns

- *[[V N] N]*

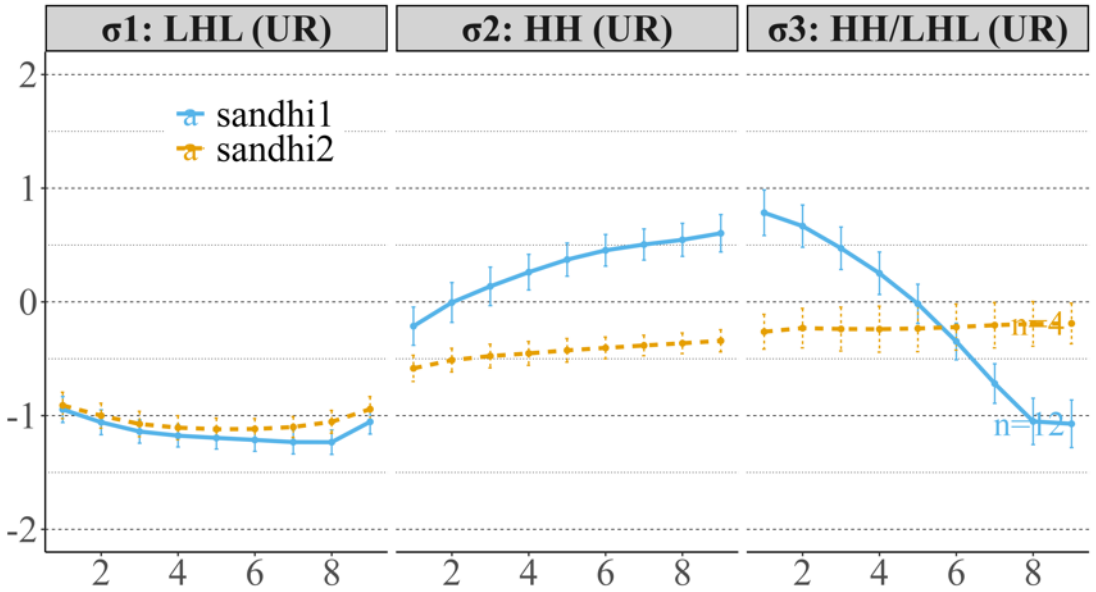
Again, 4 citation tone sequences: (1) LHL-initial; (2) only consisting of LHL & HH

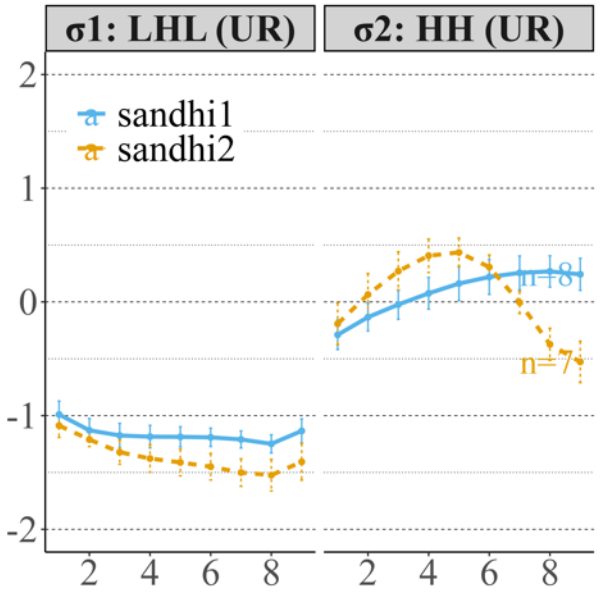


Results: trisyllabic sandhi patterns

- *[[V N] N]*

Citation tone combinations: LHL—**HH**—HH/LHL





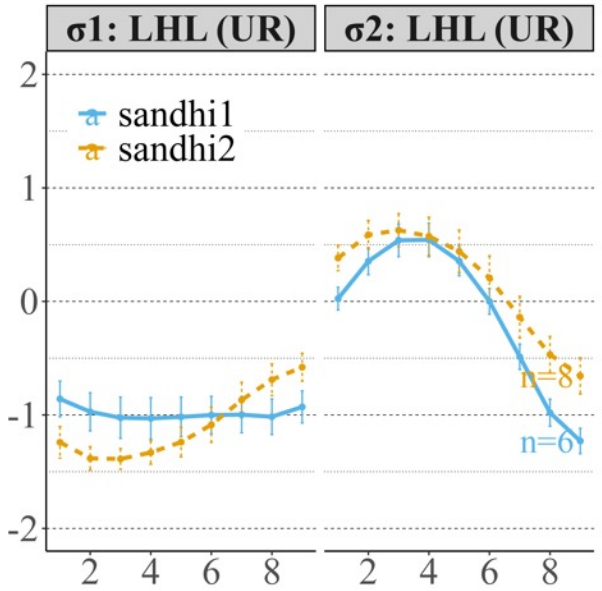
- ***right-dominant*** sandhi applies within the disyllable
- ***left-dominant*** spreads the tone features of the second syllable to the third syllable

Recall: disyllabic ***right-dominant*** patterns for LHL—**HH** combination

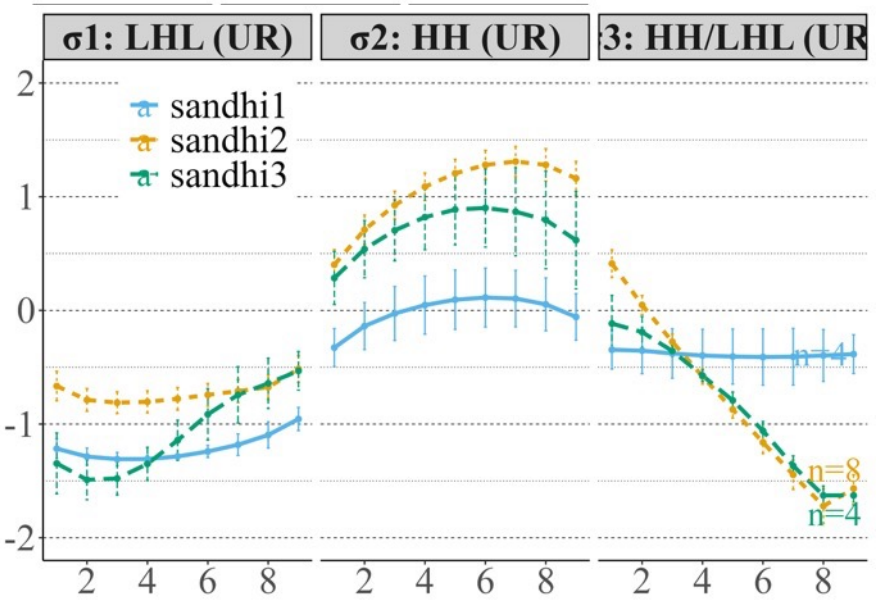
Results: trisyllabic sandhi patterns

- *[[V N] N]*

Citation tone combinations: LHL—**LHL**—HH/LHL



Recall: disyllabic ***right-dominant*** patterns for LHL—**LHL** combination



- ***right-dominant*** sandhi applies within the disyllable
- ***left-dominant*** spreads the tone features of the second syllable to the third syllable

Results: trisyllabic sandhi patterns

- ***[[A N] N]***

	[[σ_1	σ_2]	σ_3]
Citation tones	LHL	T_1	T_2
Neutralization	L	L	LH/LHL

- ***[[V N] N]***

	[[σ_1	σ_2]	σ_3]
Citation tones	LHL	AB	T_2
Reduction	L/LM	AB	
Spreading	L/LM	A	B

Theoretical analysis

- ***A stress-based approach (Duanmu 1993, 2005; adopted by Chen 2000)***
  - A tonal domain in Shanghai is a left-headed foot
  - Assign cyclic stress to syntactic non-heads
  - Left-to-right foot formation: form syllabic trochees from left to right (for polysyllabic words & free syllables)

- ***Disyllables***

	σ_1	σ_2	σ_1	σ_2	σ_1	σ_2
	A	N	V	N	Compound	
Non-head stress	*			*	*	
Foot formation	(A	N)	(V	N)	(Compound	)
Citation tones	LHL	T	LHL	T	LHL	T
Neutralization	(L	LH/LHL)	(L/LM/LML	(T)	(L	LH/LHL)

Theoretical analysis

- ***Trisyllables***

	σ_1	σ_2	σ_3	σ_1	σ_2	σ_3
	[[A	N]	N]	[[V	N]	N]
Stress cycle 1	*				*	
Stress cycle 2	*	*		*	*	
	*				*	
Clash resolution	*				*	
	*				*	
Stress reduction	*				*	
Foot formation	(	)	( )	( )	(	)
Foot reduction	(		)	( )	(	)
Citation tones	LHL	T_1	T_2	LHL	T_1[AB]	T_2
Neutralization	(L	L	LH/LHL)	(L/LM)	(A	B)

Theoretical analysis

- ***[[A N] N]***
- example *黄瓜皮 'cucumber skin'*

	[[σ_1	σ_2]	σ_3]
Citation tones	LHL	T_1	T_2
Neutralization	(L	L	LH/LHL)

- ***[[V N] N]***
- example *卖花人 'people who sell flowers'*

	[[σ_1	σ_2]	σ_3]
Citation tones	LHL	T_1	T_2
Reduction	L/LM	T_1 [AB]	
Spreading	(L/LM)	(A	B)

Limitation of the stress-based approach

Why [[V N] N] adopts a one-to-one association (tone spreading),
but [[A N] N] does not?

Theoretical analysis

- ***[[A N] N]***
- example *黄瓜皮 'cucumber skin'*

	[[σ_1	σ_2]	σ_3]
Citation tones	LHL	T_1	T_2
Neutralization	(L	L	LH/LHL)

- ***[[V N] N]***
- example *卖花人 'people who sell flowers'*

	[[σ_1	σ_2]	σ_3]
Citation tones	LHL	T_1	T_2
Reduction	L/LM	T_1 [AB]	
Spreading	(L/LM)	(A	B)

Alternative proposal: dual prominence

(data source: Rose 1990; analysis: Li 2005)

Zhenhai	σ_1	σ_2
Citation tones	HL	T
Tone deletion	HL	
Tone movement	M	HL

edge prominence ***metrical prominence***

Conclusion

- ***Disyllabic sandhi***: Co-existence of left- & right-dominant sandhi in Xiangshan
- ***Trisyllabic sandhi***: Asymmetry of sandhi in [[A N] N] & [[V N] N] structures

- ***Stress-based approach***
  - Predicts well the formation of tonal domains for sandhi applications
  - Fails to account for different sandhi mechanisms in trisyllables
    - Dual prominence?
    - Challenges: other phonetic evidence?

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