Exploring the Variations in Disyllabic Lexical Tone Sandhi in Xiangshan Chinese

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RQs: (1) What are possible lexical tone sandhi patterns in Xiangshan Wu Chinese?
(2) What are possible factors contributing to the variation, if any, in the sandhi patterns?

Introduction

1. Xiangshan (Northern Wu)

2. Tone inventory in Xiangshan[1]

Tonal mixture/variation between HH and HL; LHL and LH

	ping	*shang*	*qu*	*ru*
yin	HH		HL	Hq
yang	LHL		LH	LHq

Non-checked | checked

3. Lexical tone sandhi in Northern Wu dialects

- **Left-dominant:** rightward tone extension of the initial tone
  e.g., in Shanghai, 53 + T → 55 + 31[2]

→ **Does it also hold in Xiangshan Wu?**

Methodology

1. Participants & Materials

- 8 Xiangshan speakers (4 female; age: 47-53) * 14 disyllabic **lexical compounds** with **HH-initial** non-checked tone combinations = 112
  - HH-initial tokens selected as a subset due to limited space
  - Checked tones excluded due to different tonal behaviours
- Examples below; head rows/column present citation tones produced by informant in pilot study

σ_1 \ σ_2	HH *yinping*	HL *yinqu*	LHL *yangping*	LH *yangqu*
HH *yin ping*	shu bao *backpack*	qing cai *a variety of cabbage*	shu fang *study (N.)*	qing dou *green soya bean*
HH *yin shang*	shou ji *mobile phone*	hai dai *kelp*	shou lian *bracelet*	bian dou *haricot bean*

2. Tone sandhi pattern categorisation:

- Independent **auditory categorisation**
- ***k*-means clustering** using *kml* package[3] in *R*

Results

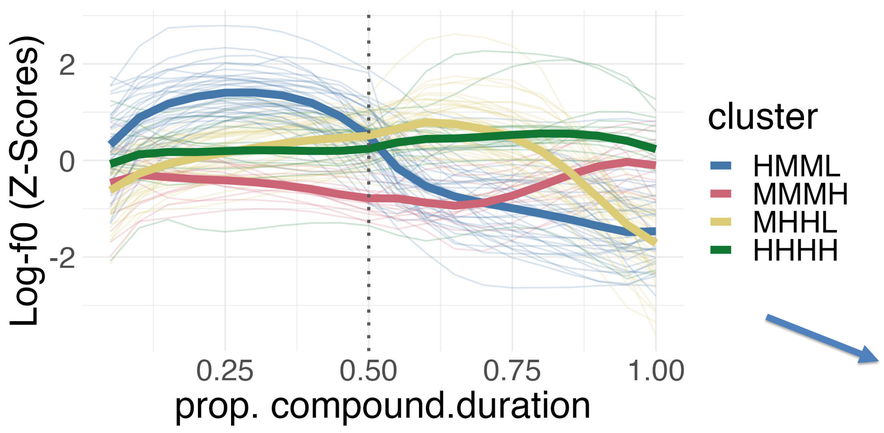
1. Initial synchronic tone variation

Random tonal variation: some produced as a HL tone

Speakers	Syllables produced with HL tone
S4	bian *flat*, shui *water*, qing *green*
S5	shu *book*, ku *bitter*, qing *green*, ying *cherry*
S8	bian *flat*, shou *hand*, qing *green*

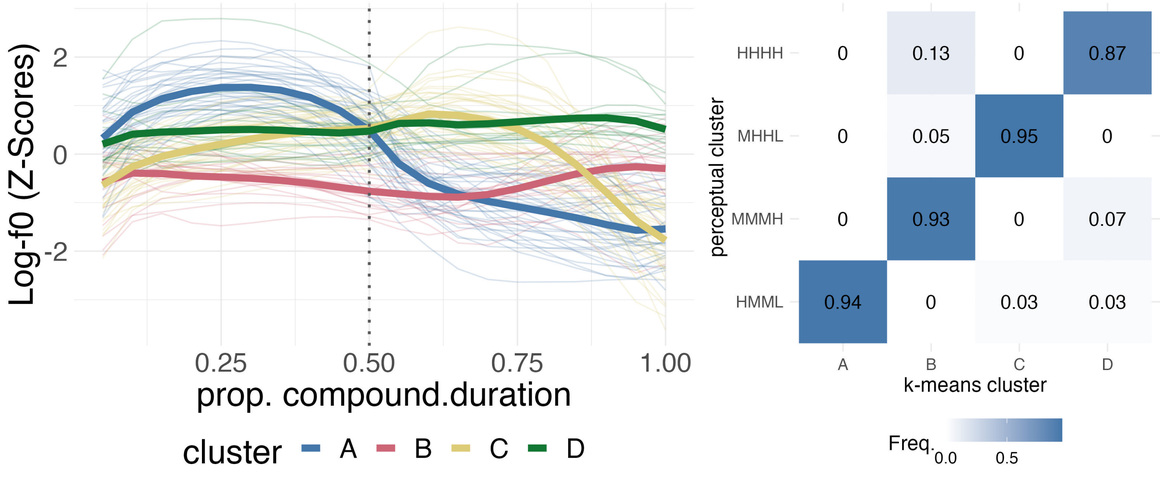
2. Disyllabic tone sandhi patterns

- **Auditory categorisation**: 4 distinctive patterns



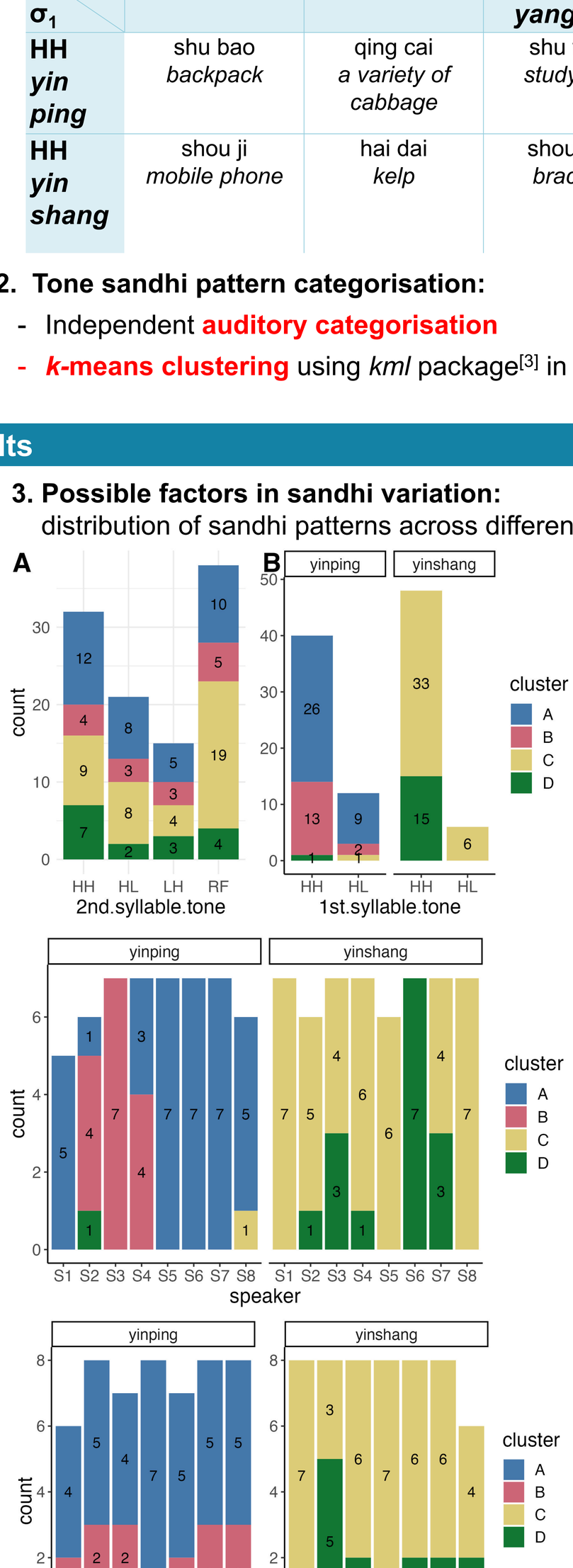
Robust results!

- ***k*-means clustering & heatmap distribution** of *k*-means clusters (x-axis) against auditory categories (y-axis)



3. Possible factors in sandhi variation:

distribution of sandhi patterns across different factors



A: second tones
- No role = left-dominant

B: initial tones
- **Historical tones: clear bifurcation**
- Synchronic tones: similar trends

Speakers
- **Inter-speaker categorical variation**
- *yinping*-initial: S2, 3, 4 chose B; others chose A;
- *yinshang*-initial:D only existed in S2, 3, 4, 6, 7.

Items
- Evenly distributed
- Not item-based selection of sandhi pattern

Initial historical tone categories & speakers

Discussion

- Importance of initial historical tonal categories in lexical sandh
- distinctive development paths for sandhi forms and citation tones
- Speaker variations might reflect different stages of language change

References: [1] Shi. (2020) *Tones and Disyllabic Tone Sandhi in Xiangshan Chinese Dialect.* [2] Xu, Tang, & Qian. (1981) Tone sandhi in New Shanghai. *Fangy*Xu (2013). [3] Genolini, Falissard,, & Kiener. (2023). *kml: K-Means for Longitudinal Data.*