An exploratory study of phonetic accommodation of Cantonese sound change in human-human and human-AI interactions

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Introduction

Sound change in the new AI era

Exemplar-based theories：(Johnson, 2006; Pierrehumbert, 2003)

- long-term sound change can be seen as the result of accumulation of short-term accommodation

New source of speech input：

- AI voice and speech also become part of speech input that can trigger changes

Research questions

1. Do speakers accommodate differently in **human-human vs. human-AI interactions**?
2. How does it affect the ongoing Cantonese sound change in Hong Kong?

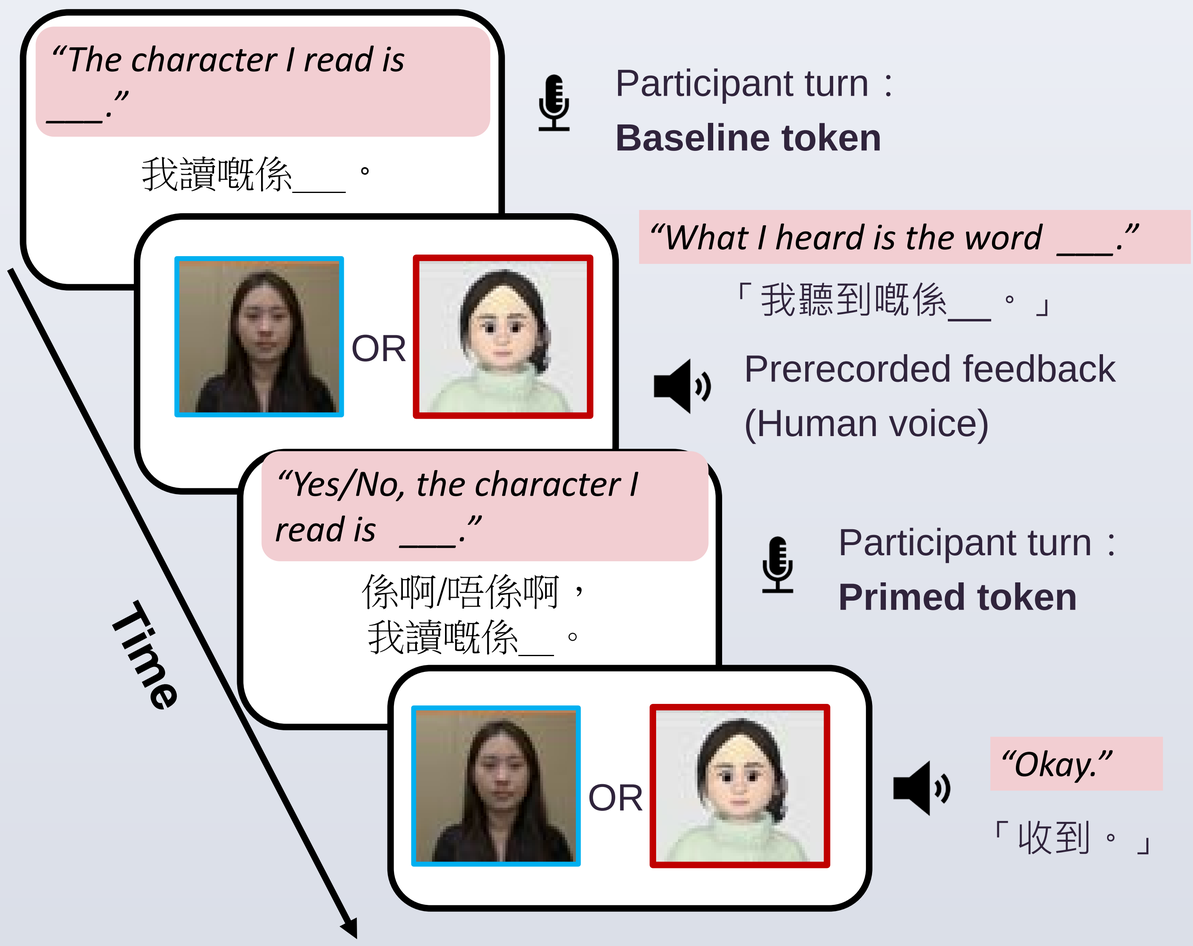
Study Design

Participants & experiment design

- 20 young native speakers of Hong Kong Cantonese
- Pilot 1: 📷 Image; Pilot 2: 📹 Video

Error-repair paradigm

(Cohn & Zellou, 2021; Zellou et al. 2021)



Selected features

Feature	Conservative form	New variant
Onset [n]-[l] merging	[neɪ] 你 'you'	[leɪ] 'you'
Onset [ŋ] deletion	[ŋɔ:] 我 'I'	[ɔ:] 'I'
Syllabic [ŋ̩]-[m̩] merging	[ŋ̩] 午 'noon'	[m̩] 'noon'
[ŋ]-[n] merging	[kɔŋ] 講 'to say'	[kɔn] 'to say'
Palatalisation of [s]	[sy:] 樹 'tree'	[ʃy:] 'tree'
[kʷ]-[k] merging	[kʷɔk] 國 'country'	[kɔk] 'country'
Pinjam	[tsɐu lɔŋ**21**] 走廊 'corridor'	[tsɐu lɔŋ**25**] 'corridor'
High-falling of T1	[sa:m**55**] 三 'three'	[sa:m**51**] 'three'

- Each feature was represented by a set of monosyllabic characters and a set of disyllabic words, except for the tonal features.

Results

Accommodation patterns

When speakers' primed token differs from its baseline:

- **Convergence**: Primed token = Model token
- **Divergence**: Primed token ≠ Model token

Image condition： Human > Avatar

	Interlocutor	Converge (%)	Diverge (%)
Monosyllabic	Human	**2.93**	2.34
	Avatar	0.39	1.17
Disyllabic	Human	**1.72**	1.56
	Avatar	0.63	0.00

Video condition： Avatar > Human

	Interlocutor	Converge (%)	Diverge (%)
Monosyllabic	Human	3.13	0.39
	Avatar	**11.72**	7.81
Disyllabic	Human	3.13	3.13
	Avatar	**6.56**	3.44

Overall: 📹 Video > 📷 Image

- We did observe accommodation patterns across conditions, but the overall effect is weak.

Accommodation hierarchy

High

- Syllabic [ŋ̩]-[m̩] merging
- Coda [ŋ]-[n] merging
- Onset [n]-[l] merging
- Onset [ŋ] deletion

Low

- **Nasal features** are more likely to change across conditions.
- Tonal features have no change.

Discussion & Conclusion

Videos are conducive to more phonetic accommodation

- Participants tend to accommodate more towards a lively talker compared to static images.

A hierarchy of accommodation pattern was found, which might be related to the status of Cantonese sound change variants (To et al., 2015)

- An ongoing variant: Coda [ŋ]-[n] merging
- An almost-complete variant: Onset [n]-[l] merging
- Sound change completed: Onset [ŋ] deletion

A weak accommodation effect in general

- A new paradigm was used in our subsequent studies.

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Key reference

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