CAN ENGLISH BECOME A TÓNE LÁNGUÀGE?

PRODUCTION OF LEXICAL TONES IN HONG KONG ENGLISH

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buy by four for

WORD-LEVEL PROSODY OF CONTACT LANGUAGES

- Recent literature on language contact: non-tonal European languages may **become tonal** upon contact with tonal African languages (Good, 2004; Guri, 2012; Gussenhoven, 2014; Steien & Yakpo, 2020; Yakpo, 2018)
- Motivation: tone language speakers' **reinterpretation** of non-tonal L2 stress and intonation systems (Finney, 2004; Guri, 2012; Steien & Yakpo, 2020)

WORD-LEVEL PROSODY OF CONTACT LANGUAGES

Guri (2012), Steien & Yakpo (2020):

- Stressed syllables in non-tonal languages often receive high pitch accent **H***
  - **Stressed** syllables → **H tone**
- Unstressed syllables do not carry any pitch accent, lower pitch than stressed syllables
  - **Unstressed** syllables → **L tone**

WORD-LEVEL PROSODY OF CONTACT LANGUAGES

- Function and content words often assigned with different tones,

  L tone for function words, **H tone** for content words

- Function words in English are **unstressed** by default (Selkirk, 1996; Bell et al., 2003) → **L tone**

- Thus, function vs. content word **minimal pairs** in English-lexifier contact languages

  - E.g., *bay* 'by' (L tone) vs. *báy* 'buy' (H tone) in Pichi (Yakpo, 2018)

TONES IN HONG KONG ENGLISH (HKE)?

- Yiu (2014) and Wee (2016) observed **lexical pitch patterns** in polysyllabic content words in HKE, evidence for lexical tones
- Köhnlein et al. (2019) rejected Wee (2016)'s analysis because the observed pitch patterns are predictable by metrical foot

OBJECTIVE

- Examine whether **lexical tones** exist in **Hong Kong English** (HKE), a contact variety of English with tonal Cantonese substrate
- Comparing **pitch** production of monosyllabic **content** and **function words** between speakers of **HKE** and **American English**
- Examine whether **social factors** affect pitch production of monosyllabic content and function words by HKE speakers

METHODOLOGY

- 39 speakers of HKE, aged 18-58 (22 females, 17 males)
- All fluent Cantonese-English bilinguals, born and raised in Hong Kong
- Interview schedule:
    1. Sociolinguistic interview
    2. Word list
    3. Minimal pair
- Demographic & attitudinal info: sociolinguistic interview
- Pitch production data: word list reading

METHODOLOGY

- 4 speakers of American English as control
- 2 male and 2 female speakers, aged 22-24
- Only word list and minimal pair reading tasks were carried out

METHODOLOGY

- 9 pairs of monosyllabic content word vs. function word homonyms (e.g., **four** vs. **for**), 2 additional function words, 20 words in total
- Function words from 5 different parts of speech:
  - Auxiliary, conjunction, determiner, preposition, modal
- Presented in pseudo-random order, 3 repetitions
- Target words embedded in carrier phrase “Say __ again”
- Prosodic environment controlled, focused position for target words

SOCIAL VARIABLES

1. Age
2. Gender
3. Education level
4. Language affiliation (What kind of English do I speak?)
5. Language orientation (What kind of English do I **want** to speak?)
6. Attitudes towards HKE
7. Exposure to other varieties of English (social network, media consumption, living abroad)

METHODOLOGY

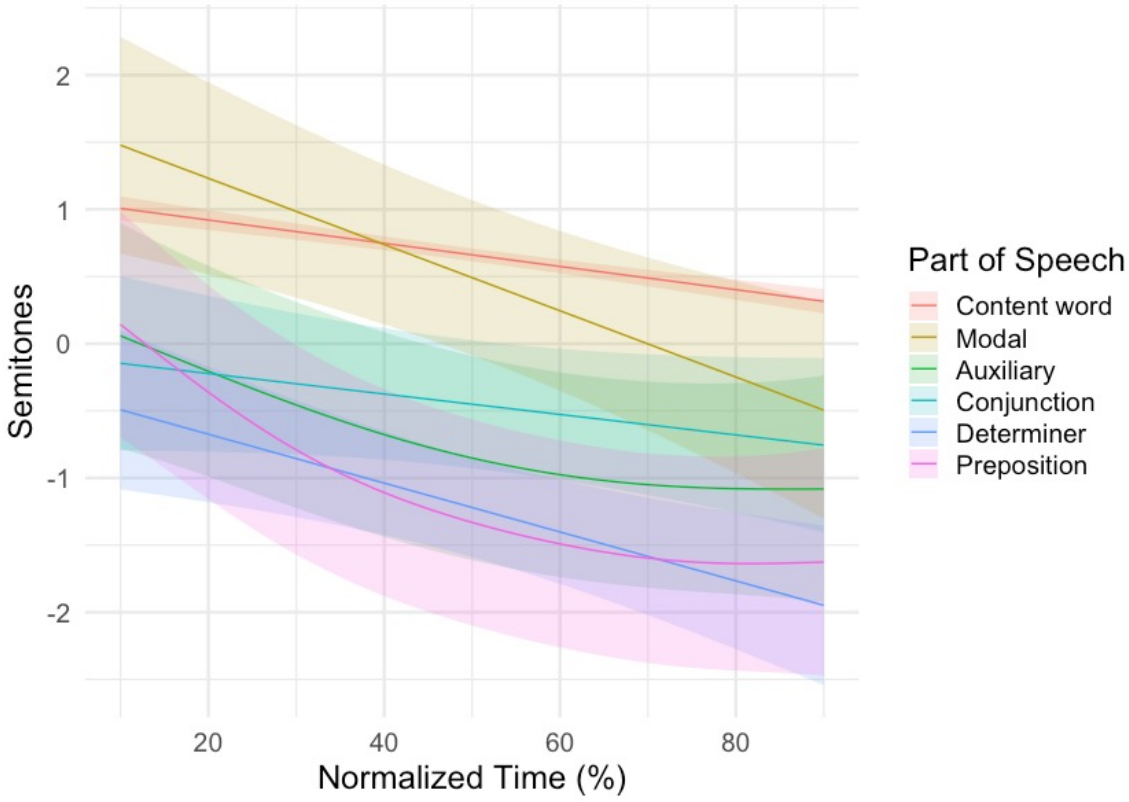
- Audio: 44.1 kHz sampling rate, 16-bit sample depth
- Recordings segmented using Montreal Forced Aligner (McAuliffe et al., 2017), then manually reviewed and corrected
- F0 values taken at every 10% interval between 10-90% of the sonorant part of target words using Praat (Boersma & Weenink, 2022)
- F0 converted into **semitones** and **z-score** normalized by speaker

METHODOLOGY

- **Generalized additive mixed modelling** (GAMMs) in *R* with mgcv (Wood 2017) and itsadug (van Rij et al. 2020)
  - Test the difference in dynamic F0 between content words vs. function words
  - Separate models for HKE and American English speakers
- **Mixed effect logistic regression** models in *R* with lmerTest (Kuznetsova et al., 2017)
  - Test the effect of social variables on pitch production of HKE speakers
  - Separate models for each social factor

RESULTS

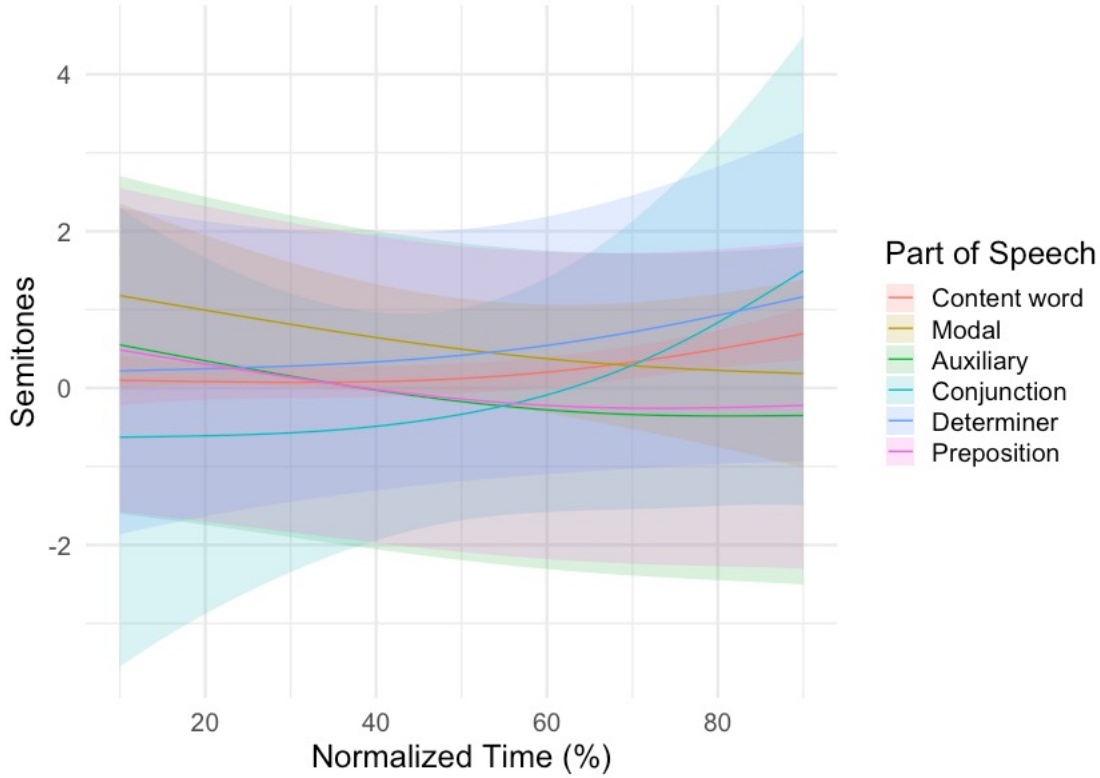
- GAMMs:
  - Speakers of HKE and American English differ in their pitch production
  - HKE: content words significantly **higher F0** throughout the entire sonorant duration than all function words except modals



Fitted smooths with 95% CI for F0 (in semitones) of words produced by HKE speakers by part of speech

RESULTS

- GAMMs:
  - American English: **no difference** in pitch by part of speech



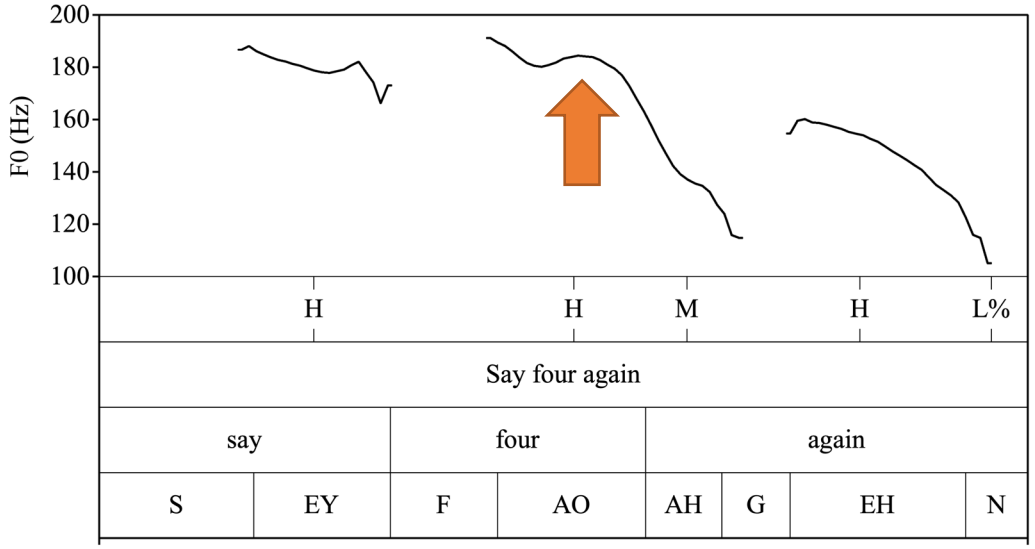
Fitted smooths with 95% CI for F0 (in semitones) of words produced by American English speakers by part of speech

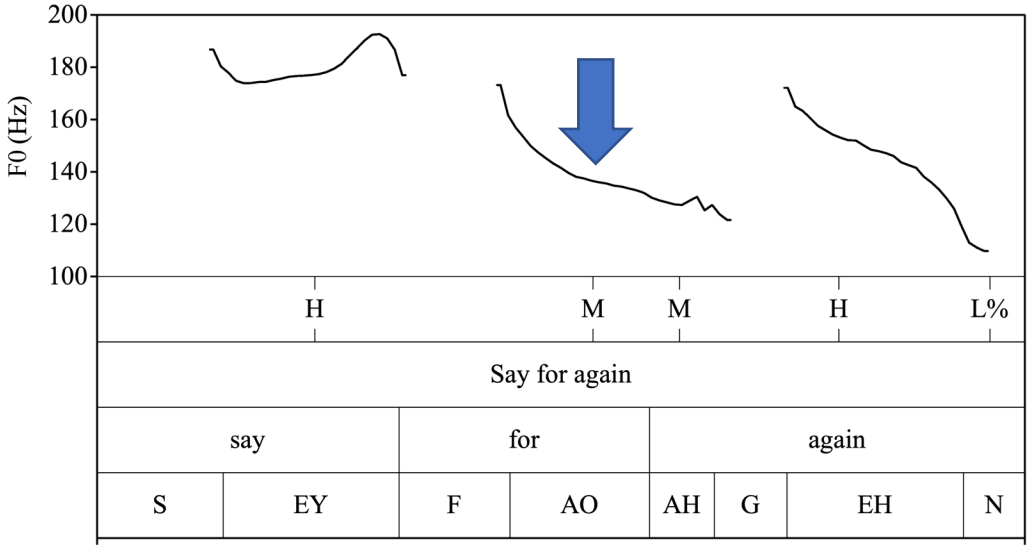
RESULTS

Social factors that correlate with lower F0 on function words (only $p < 0.05$ reported):

- **Older** speakers
- More **educated**
- **Stronger orientation** towards HKE
- More **positive attitudes** towards HKE
- **Less contact** with other varieties of English through social network
- More time **living abroad**

DISCUSSION





Evidence for lexical tones:

Since the target words are focused, differences in F0 between content and function words must be lexical rather than intonational

DISCUSSION

- Results suggest the existence of two contrastive lexical tones in HKE:
  - Content words, modals: a **higher tone**
  - Other function words: a **lower tone**
- In accordance with the analyses of Yiu (2014) and Wee (2016): {H, Ø} two-tone system in HKE

DISCUSSION

- **Tonogenesis** can be triggered by language contact between non-tonal lexifiers and tonal substrates, as in HKE
- Lexical tone system bears sociolinguistic significance for speakers of HKE
  - Diachronic change: HKE becoming less tonal over time
  - Indexes positive stance and orientation towards HKE instead of Standard English

DISCUSSION

More questions:

- Where does HKE fit in prosodic typology?
- Why are modals assigned a different tone from other function words?
- Are tones in HKE direct transfer from Cantonese?
  - Yiu (2014): HKE tones do not correspond to Cantonese tones
- Perception of HKE tones?

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APPENDIX: WORD LIST

	Function word	Content Word homonym
Auxiliary	be	bee
Conjunction	but	butt
	or	ore
Determiner	an	Ann
	their	there
Preposition	by	buy
	for	four
	to	two
Modal	would	wood
	could	N/A
	should	N/A

APPENDIX: MODEL SPECIFICATIONS

GAMM:

```
bam(F0 ~ pos +
        s(time) +
        s(time, by = part of speech) +
        s(repetition, by = part of speech) +
        ti(time, repetition, by = part of speech) +
        s(time, speaker, by = part of speech , bs = 'fs', m = 1) +
        s(time, word, by = part of speech , bs = 'fs', m = 1),
        control = gam.control(trace = TRUE),
        data = ., method = "fREML")
```

Mixed-effect model:

F0 ~ part of speech * social variable + time + repetition + (1|speaker) + (1|word)