

Rhythmic variation in code-switching between Mandarin, English, and Singlish in Singapore

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Chulalongkorn University

Introduction

- Education: English + Mother Tongue (MT)
 - Effectively bilingual
- English is becoming the **primary home language** for all ethnic groups
 - 28.1% → 37% → 48.3% (Department of Statistics 2005, 2015, 2020)
 - More apparent at upper socioeconomic classes and higher education levels
- Code-switching between English and Mandarin remains commonplace among Chinese Singaporeans

Singapore Englishes

- Singapore Englishes (SgE) vary along a continuum
 - Standard Singapore English (StdE)
 - Singlish
- Singlish has its own grammar, vocabulary, and distinctive pronunciation
 - e.g., lexical items from Hokkien and Malay
 - Singlish is virtually mutually unintelligible with other varieties of English
- Both types of Englishes are described to have **syllable-timed rhythm**
 - “even, somewhat staccato” (Platt & Weber 1980: 57)
 - “machine-gun” (Tay 1993: 27)
 - In contrast to the stress-timed rhythm of British English (BrE) or Standard American English

Singapore Mandarin (SgM)

- Phonology largely similar to colloquial Mandarin spoken in Taiwan and Southern China
 - Non-rhotic
 - Lack of neutral tone
 - **Syllable-timed rhythm**

Pairwise Variability Index (PVI)

- Pike's rhythm class hypothesis
 - StdE and Singlish both described as syllable-timed, whereas BrE is stress-timed
 - But lack of empirical evidence for isochrony, i.e., that certain phonological units occur at regular intervals
 - Isochrony now primarily treated as a perceptual phenomenon
- One alternative measure for rhythm is the **Pairwise Variability Index (PVI)** (Low, Grabe, & Nolan 2000)
 - “captures the degree of durational variability in a set of acoustic data, measured sequentially”
 - Normalized PVI, or nPVI, normalizes the PVI for speech rate

Pairwise Variability Index (PVI)

- Measuring nPVI

- Calculate the absolute value of the difference in duration between successive measurements of a certain segment, e.g., vowel duration
- Divide this value by the mean duration of the two measurements to normalize for speech rate
- Multiply by 100 to obtain the nPVI

$$\text{PVI} = 100 \times \left[\sum_{k=2}^n \left| \frac{v_k - v_{k-1}}{(v_k + v_{k-1}) / 2} \right| / (n-1) \right]$$

- Provides rough correlates with the rhythm classes

- **Higher nPVI** → successive vowel durations are more different → **more stress-timed**
- **Lower nPVI** → successive vowel durations are more similar → **more syllable-timed**

Previous Studies on Rhythm in Singapore

- BrE > StdE > Singlish
 - StdE is closer to BrE rhythm norms than Singlish is
- *Putonghua* > Singapore Mandarin

Language	Variety	nPVI	Rhythm class
English	BrE	57.2	Stress-timed
	StdE	52.3	Syllable-timed
	Singlish	44.2	Syllable-timed
Mandarin	<i>Putonghua</i>	45.0	Syllable-timed
	SgM	27.0	Syllable-timed

Research Goals

- Previous studies on rhythm in Singapore
 - Only one to three speakers for each study
 - Conducted more than twenty years ago
 - Different types of stimuli used across different studies
 - Did not control for or examine social variables like gender, socioeconomic status, and education
- Rhythm in code-switched contexts
 - Empirical gap
 - Differing ideologies about maintaining distinct languages when code-switching

Present Study

- This study aims to investigate **social variation in the rhythm of StdE, Singlish, and Mandarin** among Chinese Singaporeans in both **code-switched and non-code-switched environments**

Present Study

- This study aims to investigate **social variation in the rhythm of StdE, Singlish, and Mandarin** among Chinese Singaporeans in both **code-switched and non-code-switched environments**
- Locally relevant correlates of social class were identified
- Singlish and StdE treated as separate codes
- Singapore Mandarin treated as a single code
 - Has been posited to have High (H) and Low (L) varieties, but there is a lack of research on the distinctions between these two potential varieties
- Reading passage used to avoid anomalies caused by spontaneous speech

Methodology

- 16 speakers
 - English-Mandarin bilingual Chinese Singaporeans
 - 21 to 25 years old
 - Born and educated in Singapore
- Categorized according to four social variables
 - **Gender:** male/female
 - **Secondary school rank:** elite/non-elite
 - **Home language:** English/Mandarin
 - **Housing type:** public/private

Methodology

Variable		N
Gender	Female	8
	Male	8
Secondary school type	Elite	8
	Non-elite	8
Home language	English	7
	Mandarin	9
Housing type	Private	10
	Public	6
	Total	16 speakers

Materials

- Language background questionnaire
- Five passages
 - In randomized order
 - Non-code-switched
 - **StdE, Singlish, Mandarin**
 - Code-switched
 - **StdE-Mandarin, Singlish-Mandarin**

Analysis

- 1463 intonation phrases (IPs) across five passages and 16 speakers

Passage	Number of IPs	Average nPVI
StdE	275	39.85
Singlish	242	38.77
Mandarin	373	38.54
StdE-Mandarin	279	37.72
Singlish-Mandarin	294	37.51

nPVI



Results

- **nPVI for StdE and Singlish much lower** than that found in previous studies
 - StdE: 39.85 vs 52.30
 - Singlish: 38.77 vs 44.2
- **Code-switched passages recorded lower nPVI** than their non-code-switched counterparts
- **Large variation** in nPVI between and within speakers
 - StdE passage nPVI ranged from 31.54 to 52.50
 - For StdE and Singlish-Mandarin, Speaker 10 recorded 52.50 and 40.88, vs Speaker 11 recorded 35.11 and 34.58
- **StdE not the highest nPVI** for all speakers

Results

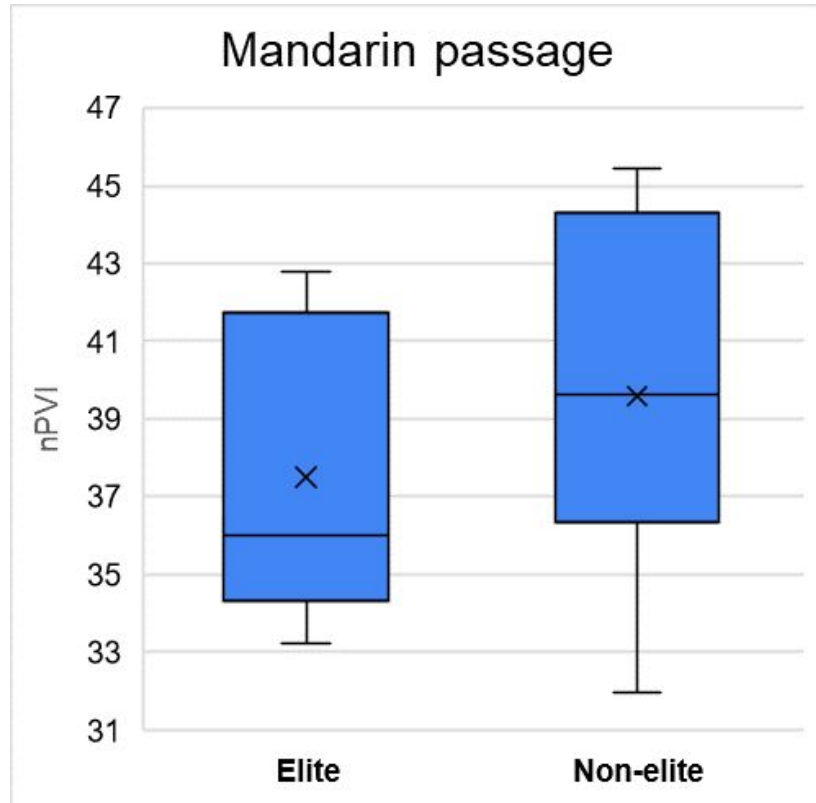
- nPVI for each IP for each speaker for each passage analyzed using a linear mixed effects regression model in R
 - Random effect: participant
 - Fixed effects: passage, gender, secondary school type, home language, and housing type

Results

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 - Random effect: participant
 - Fixed effects: passage, gender, secondary school type, home language, and housing type
- Model with the most significant effects incorporated **passage type, secondary school type, and interaction between passage and secondary school type**
 - Significant effects for Mandarin and StdE-Mandarin

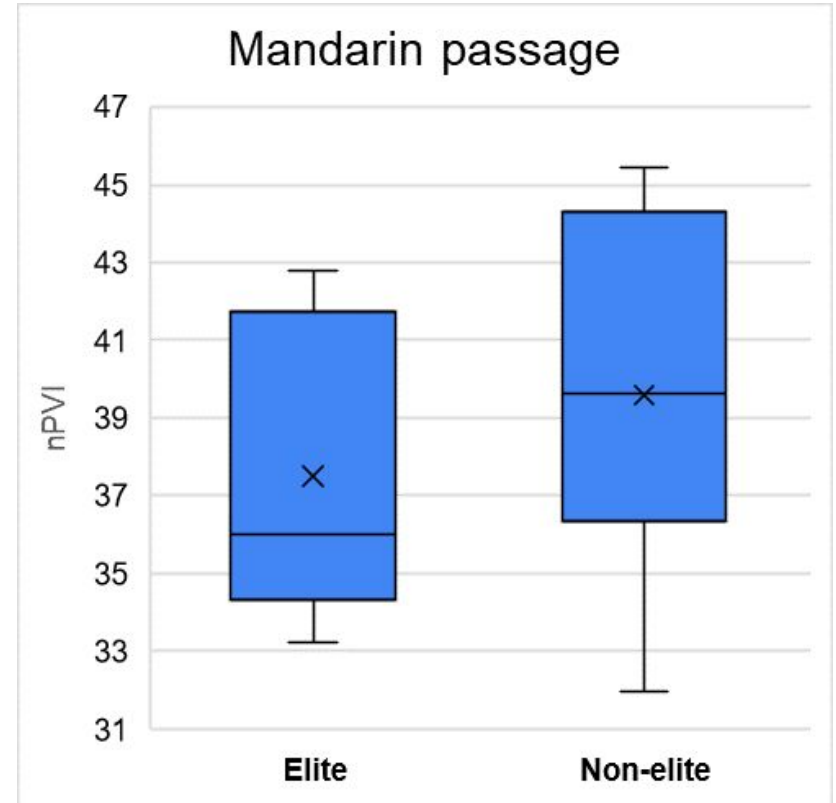
Results

- For the **Mandarin passage**, elite school speakers recorded significantly lower nPVI compared to non-elite school speakers ($p = 0.0385$)
 - Elite: 37.50
 - Non-elite: 39.58



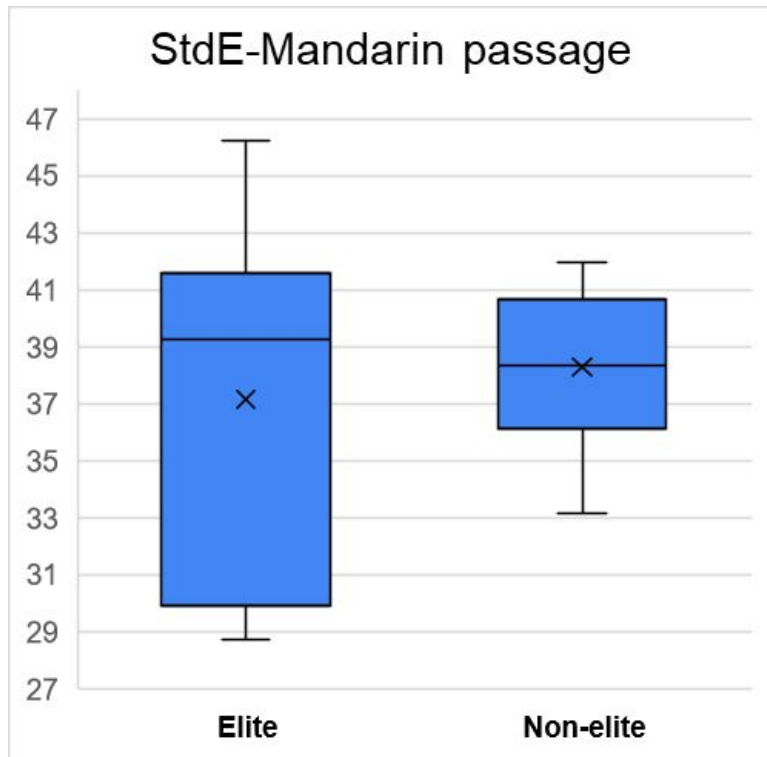
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 - Elite: 37.50
 - Non-elite: 39.58
- Elite schools presumed to reinforce more standard Mandarin norms
- But speakers from non-elite schools are the ones who orient toward standard Mandarin norms of higher nPVI instead



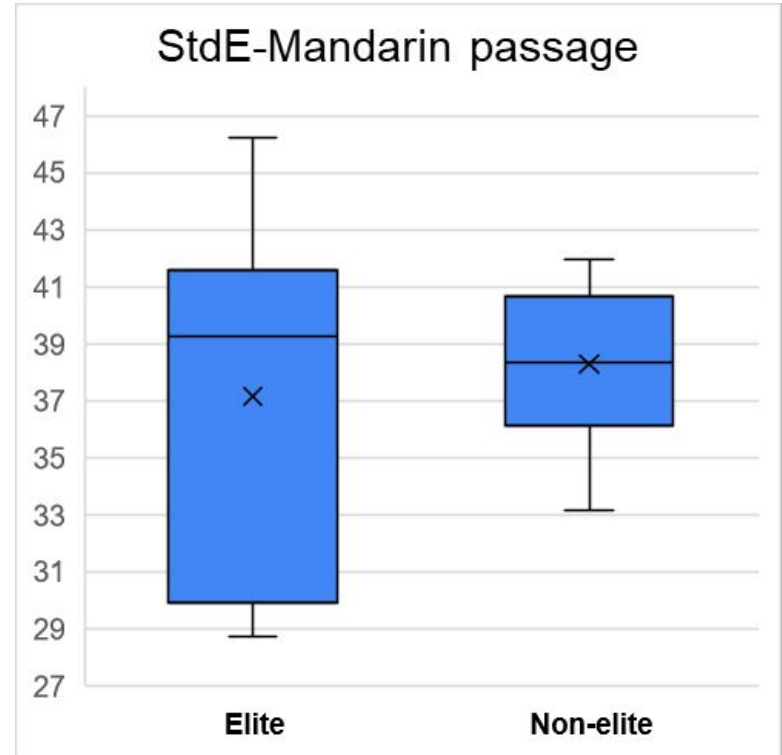
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- For the **StdE-Mandarin passage**, elite school speakers recorded significantly lower nPVI compared to non-elite school speakers ($p = 0.0245$)
 - Elite: 37.16
 - Non-elite: 38.29



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 - Elite: 37.16
 - Non-elite: 38.29
- Speakers from elite schools presumed to have stronger standard English norms of higher nPVI that persist even in a code-switched environment
- Code-switching usually occurs with Singlish, not StdE
 - Elite school speakers may associate Singlish with code-switching generally



Results

Passage	Elite (avg nPVI)	Non-elite (avg nPVI)
StdE	40.60	39.10
StdE-Mandarin	37.16	38.29
	3.44	0.89
Singlish	39.78	37.75
Singlish-Mandarin	37.83	37.20
	1.95	0.55

- Difference larger for elite school speakers than non-elite school speakers

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- Difference larger for elite school speakers than non-elite school speakers
- Presence of Mandarin may orient elite school speakers toward Singlish-like, lower nPVI-like norms, more so than for non-elite school speakers

Results

- Individual **StdE IPs** across different passages

Passage	Type of IP	Elite school (avg nPVI)	Non-elite school (avg nPVI)
StdE	StdE	40.60	39.10
StdE-Mandarin	StdE	35.92	39.24
	Mandarin	38.71	37.68

- nPVI for code-switched StdE: non-elite school speakers > elite school speakers

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- nPVI for code-switched StdE: non-elite school speakers > elite school speakers
- nPVI for code-switched StdE similar to non-code-switched StdE for non-elite school speakers, but much lower for elite school speakers

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- In StdE-SgM passage, nPVI for Mandarin > StdE for elite school speakers, even though StdE is prototypically described as having higher nPVI
- Non-elite school speakers appear to maintain **clearer rhythmic distinctions between their different codes**, at least when switching between StdE and Mandarin

Methodological Considerations

- Compared to previous studies, we found **lower nPVI for StdE and Singlish** but **higher nPVI for Mandarin**
 - More speakers used
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 - More speakers used
 - Only reading passages (non-spontaneous speech)
- Reading passages might be implicitly associated with StdE
 - StdE is more often found in written form, but Singlish is not
- Singlish usually associated with informal topics, and StdE used to talk about formal topics
 - Topic of passage was informal, i.e., buying lunch

Education, social class, and language

- The present study found significant effects of **secondary school type**
- Speakers categorized as coming from non-elite schools do not come from particularly low-ranked schools
 - 21, 22, 28, 52, 56, 58, and 108, out of 151
- Importance of schooling environment in the development of speakers' language practices, at least when it comes to rhythm

Education, social class, and language

- Elite schools in Singapore attract students from upper and upper-middle social classes
 - More likely to use English as the home language
 - Private tutoring/private tutoring companies are commonplace and used to help students get into 'good' schools
- Emphasis on education in Singapore
 - Students spend up to 12 hours/day in school
 - National ideologies of pragmatism and meritocracy
 - US\$1 billion-dollar per year tuition industry

Education, social class, and language

- Exposure to StdE, Singlish, and Mandarin
 - Differing levels of exposure to Singlish and Mandarin in school
- Non-elite school speakers had higher nPVI for Mandarin and StdE-Mandarin compared to elite school speakers
 - Social capital associated with rhythm
 - Presence of Mandarin for elite school speakers



Conclusion

- Secondary school type had significant effects on rhythm
 - Elite school speakers had lower nPVI for Mandarin and code-switched passages compared to non-elite school speakers
- Did not find effects for gender, housing type, and home language
 - Suggests that formative language practices in Singapore might be centered around the school rather than the home

Conclusion

- Education may be a more nuanced indicator of social class for Chinese Singaporeans compared to variables like housing type
- In Singapore, where education is highly prized and standard English is promoted, schooling environment plays a key role in speakers' language practices
- Even with a rough division between top twenty and non-top twenty secondary schools, effects were found
 - Underscores the significance of fine-grained class differences in how English and Mandarin are spoken in Singapore

Thank you!

yltan@stanford.edu
@yinlintan

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