Pitch variability cues perceptions of Singlish:

A perceptually-guided approach to sociophonetic variation

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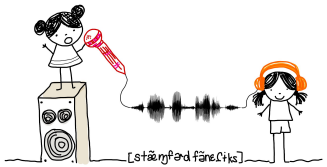


Singlish

Tamil
Mandarin (我们)
Cantonese (拍拖)
English
Dey, wǒ men paktor always makan at kopitiam one.
Malay
English
Malay
Hokkien/ Hakka (店)
???
GET IT RIGHT STICKY NOTES
Switch / Turn Off the light.
Got problem call me can?
Please let me know if you need help.

Research Aims

1. How is variable speech categorized as Singlish?

2. What role, if any, does prosody play in listeners' categorizations of Singlish?

Methods

Speeded Forced-Choice Task

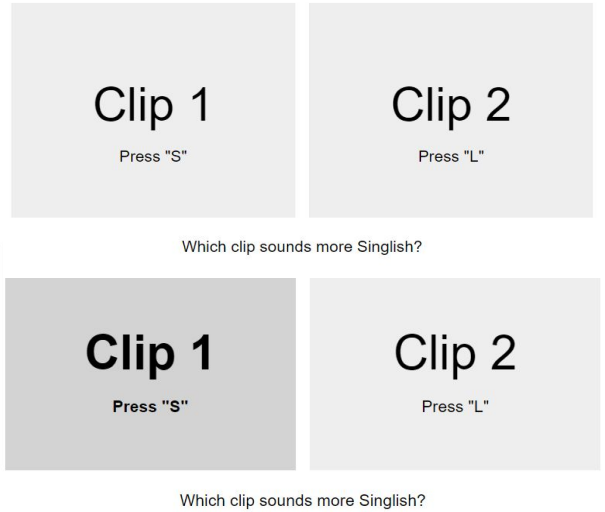
- Stimuli:
  - 40 natural-speech audio clips from podcasts
  - 5 male, 5 female talkers, 4 clips/talker
  - 1.4 to 2.6 seconds long, one IP
  - Controlled for semantic content
  - Syntactically and lexically similar to Standard English

- Listeners:
  - 132 participants
  - 121 Chinese, 2 Malay, 6 Indian, 1 Other
  - 67 Female, 62 Male, 2 Non-binary, 1 Prefer not to answer
  - Born between 1956 to 2004

Speeded Forced-Choice Task

- In each trial:
  - Hear two clips
  - “Which clip sounds more Singlish?”
  - 500 milliseconds between clips
  - 2 seconds to respond

- 6 blocks of 20 trials each
- Two clips per trial
- Randomization within each block



Follow-up questionnaire: Demographic background, Language attitudes, “List three attributes to describe the speakers who sounded more Singlish.”

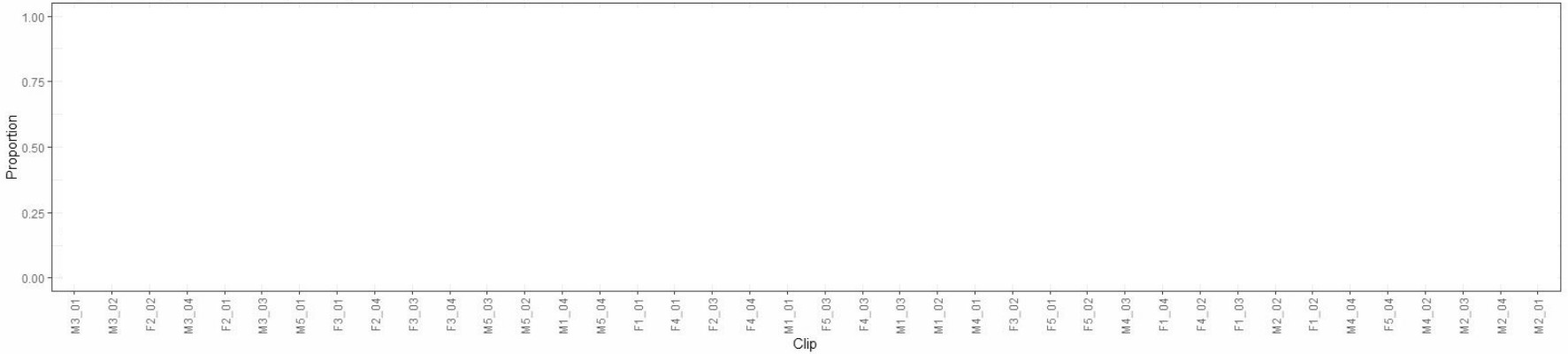
Results

1. How is variable speech categorized as Singlish?

Results

Proportion of More Singlish responses for all 40 clips

Proportion Singlish for each clip averaged across each participant

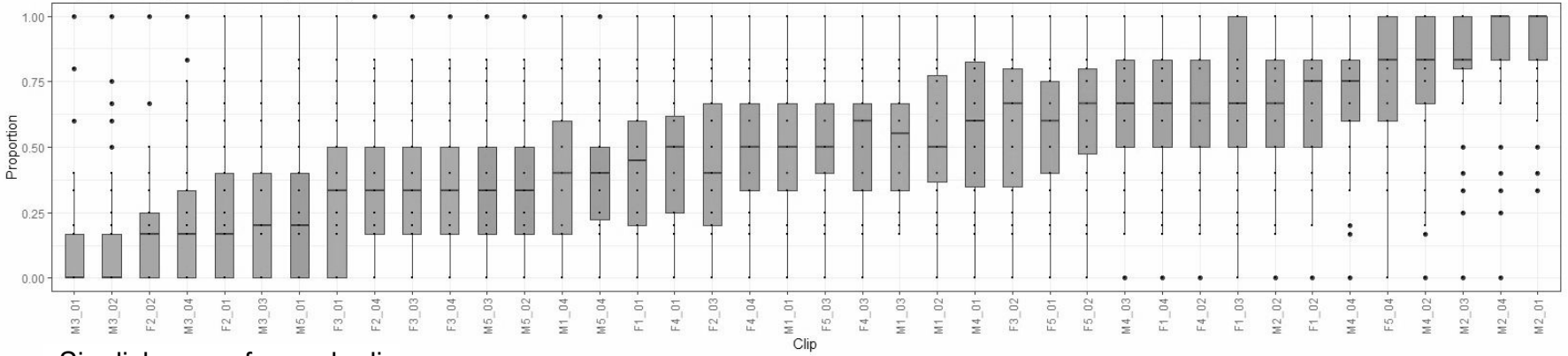


Results

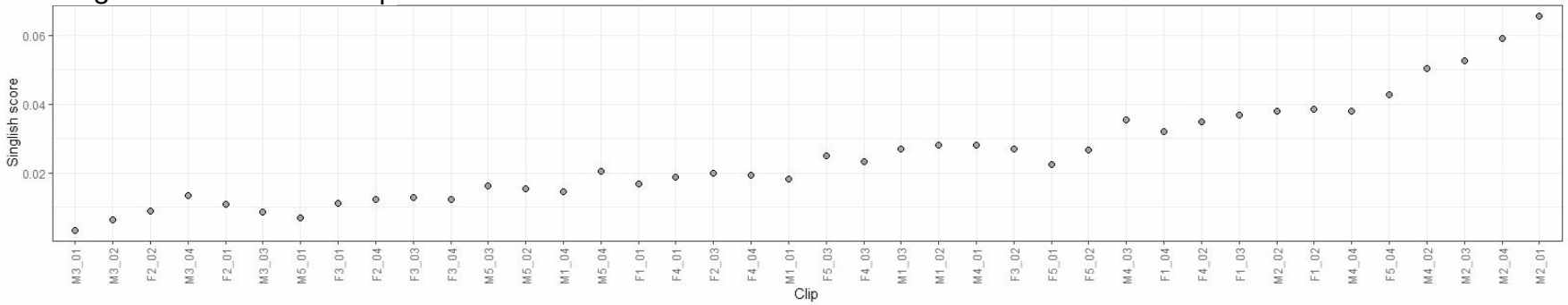
Clear trend from least to most Singlish

Fine-grained, gradient categorizations

Proportion Singlish for each clip averaged across each participant



Singlish score for each clip



Results

RT for clips that received More Singlish responses

Why reaction time (RT)?

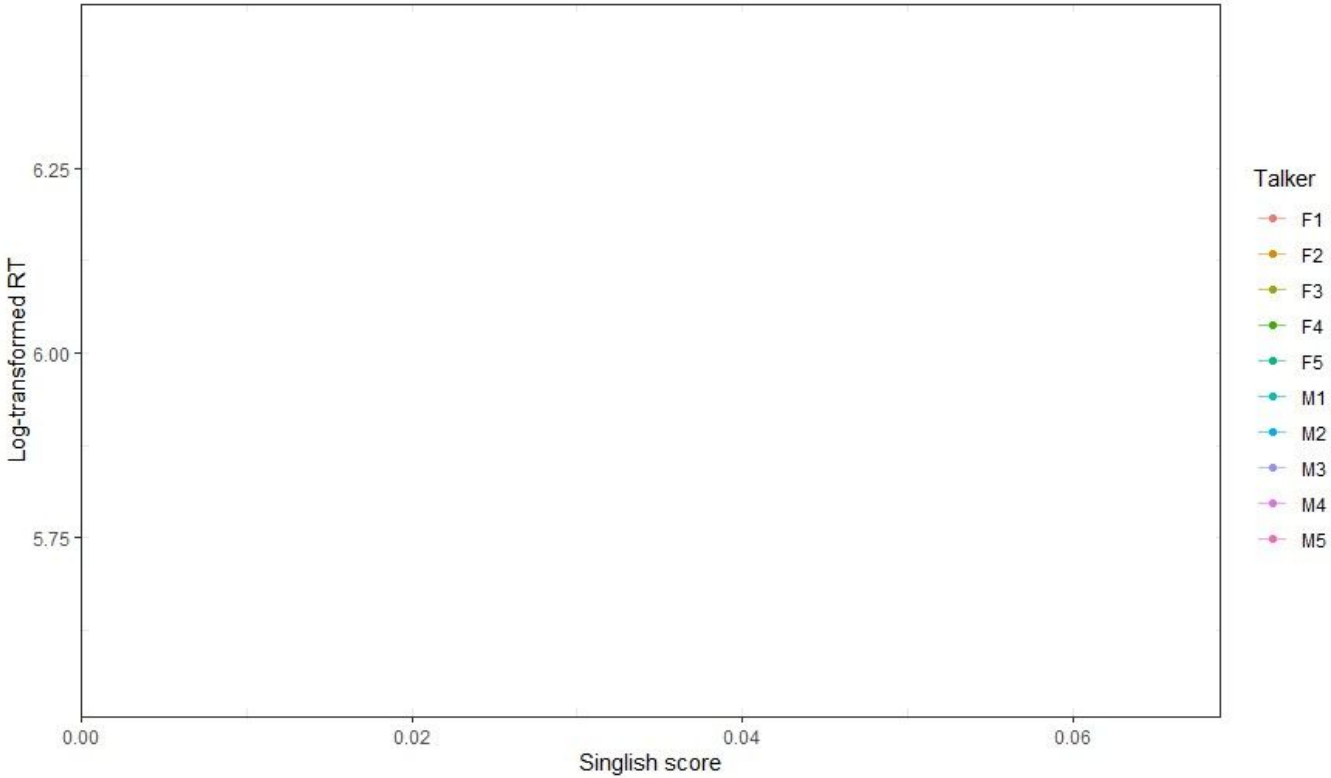
- Activation of stored information about Singlish
- More or less typical examples of Singlish

Possible Outcomes

- Higher Singlish score → Faster RT
- Lower Singlish score → Slower RT

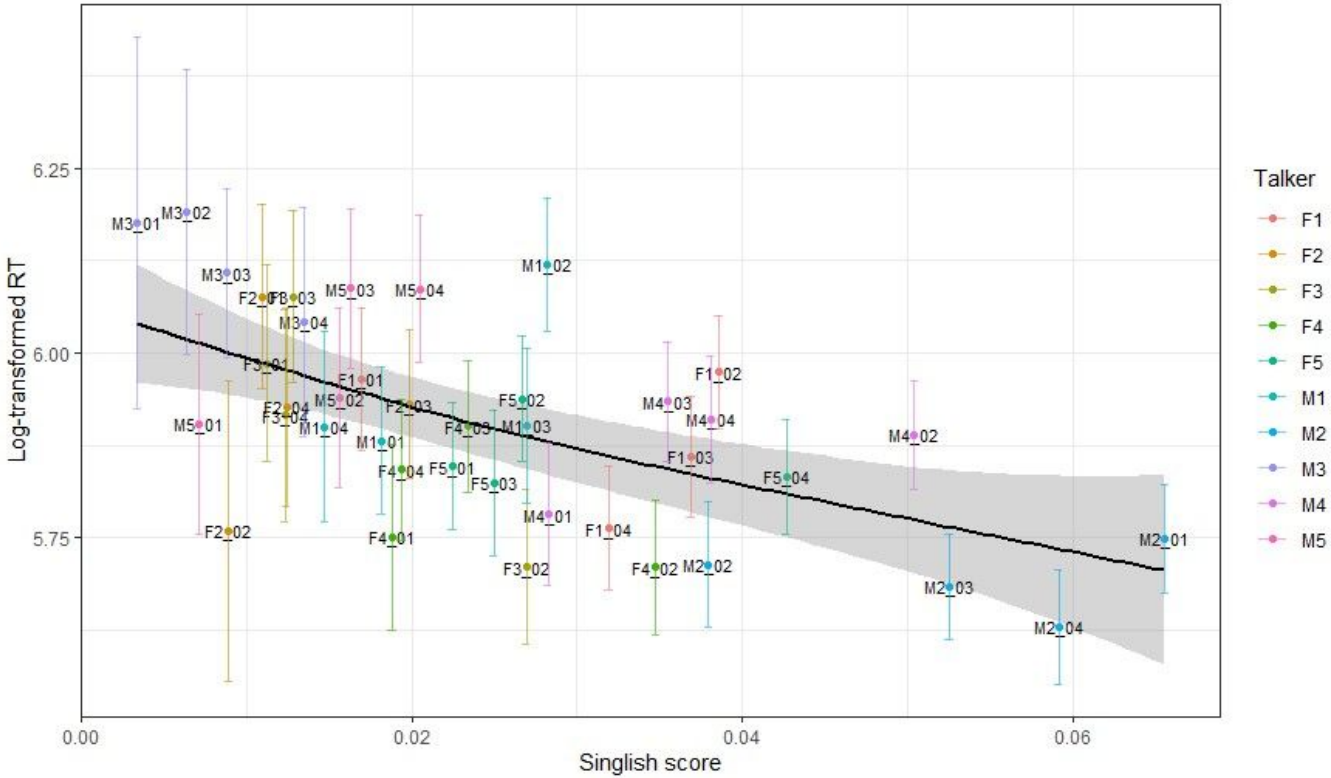
Results

RT for clips that received More Singlish responses



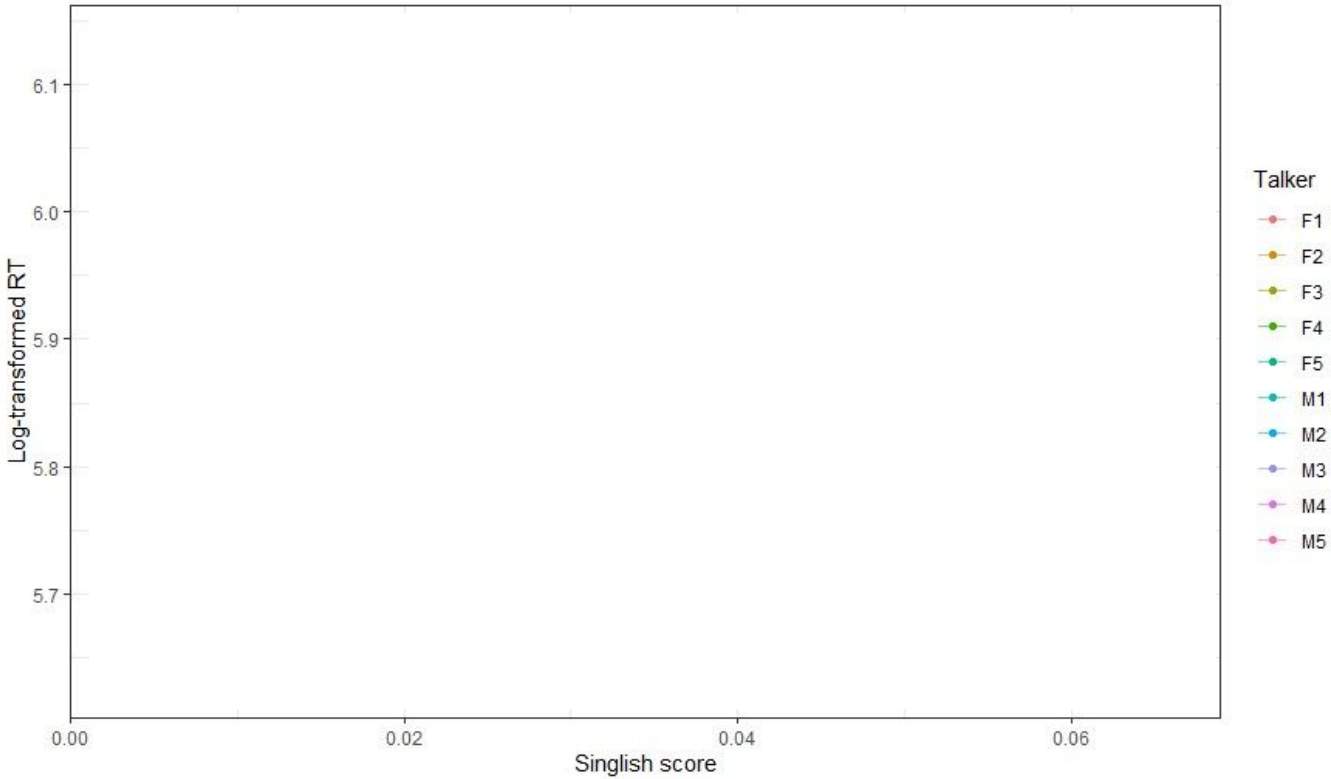
Results

Clips with higher Singlish score were chosen as More Singlish with faster RT



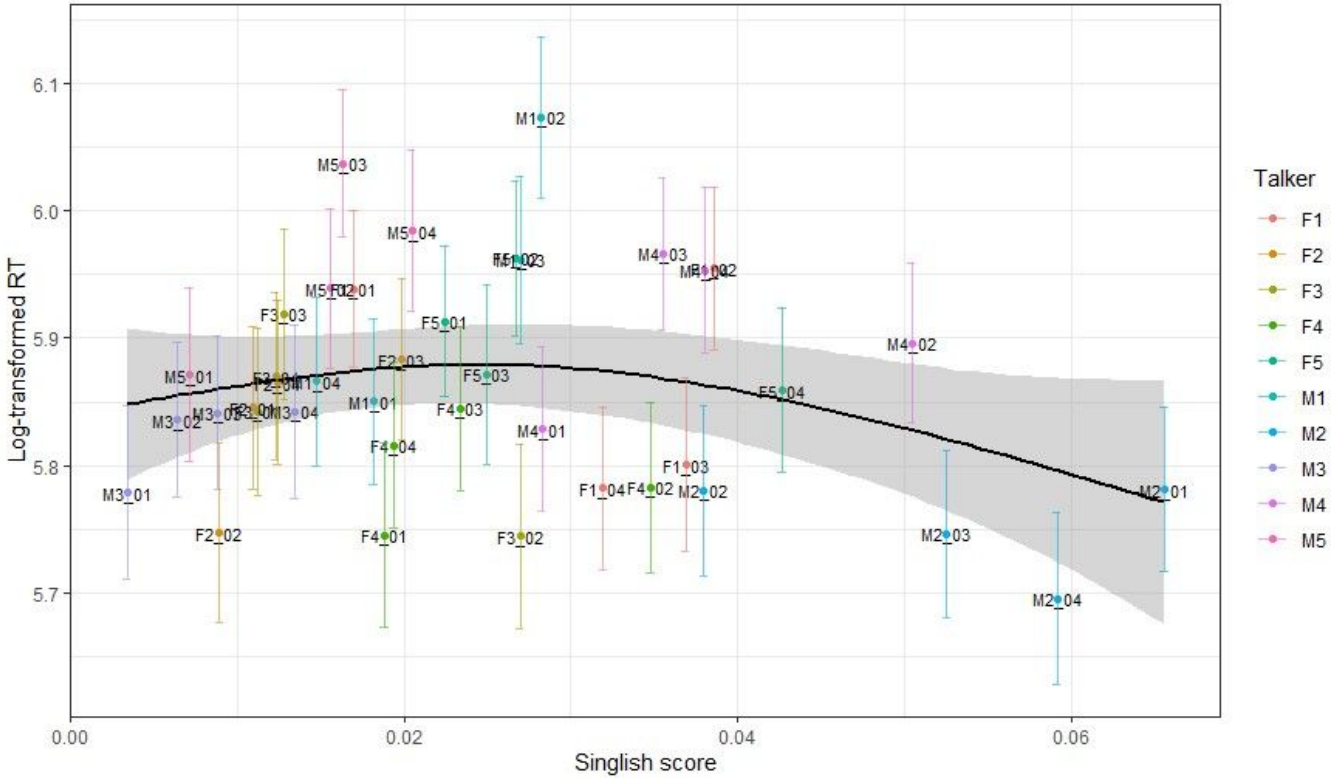
Results

RT for all clips



Results

Trials containing clips with the highest and lowest Singlish scores were completed with faster RT



Results: Interim Summary

Categorization of Singlish was **gradient**, in terms of both **response choice** and **response speed**, and consistent with **typicality effects** observed in other types of categorization.

2. What role, if any, does prosody play in listeners' categorizations of Singlish?

Results

“List three attributes to describe the speakers that sounded more Singlish.”

- *tune (rhythmic like in mandarin)*
- *variety in intonation*
- *monotonous*
- *flat tone*
- *speaking too fast*
- *fast speaking*

Results

“List three attributes to describe the speakers that sounded more Singlish.”

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Results

Following from participants' responses, we analyzed:

1. Pitch PVI *
   = comparisons of adjacent vowels' maximum semitones
2. Pitch variance *
   = standard deviation of mean semitone of each vowel
3. Durational PVI
   = comparisons of adjacent vowels' durations
4. Articulation rate*
   = syllables per second

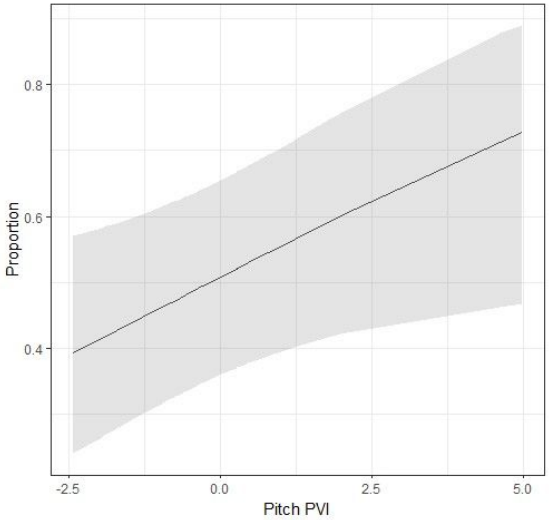
Results

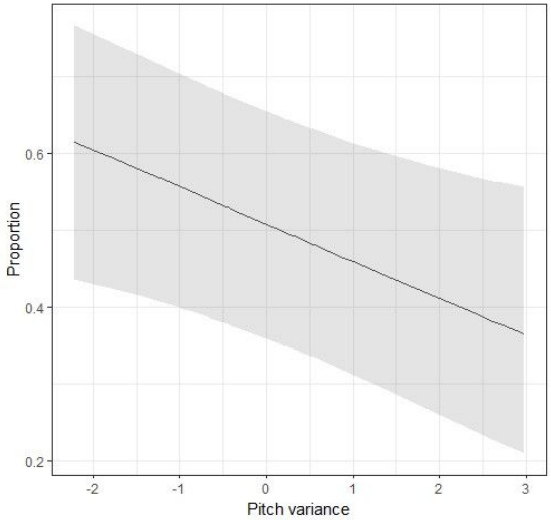
- Logistic mixed effects regression model
  - Dependent variable: Singlish (1/0)
  - Fixed effects: pitch PVI, pitch variance, durational PVI, articulation rate
  - Random effects: clip, participant, speaker

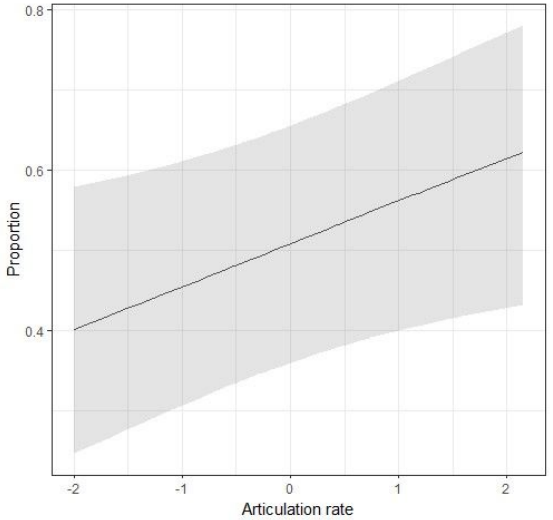
Results

A clip was more likely to be chosen as the More Singlish clip if it had:

- higher pitch PVI
  (*p* = .046)
- lower pitch variance
  (*p* = .022)
- faster articulation rate
  (*p* = .041)







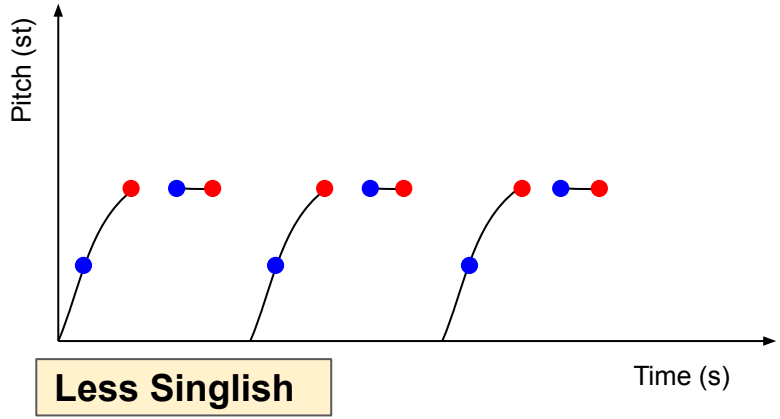
Results: Summary

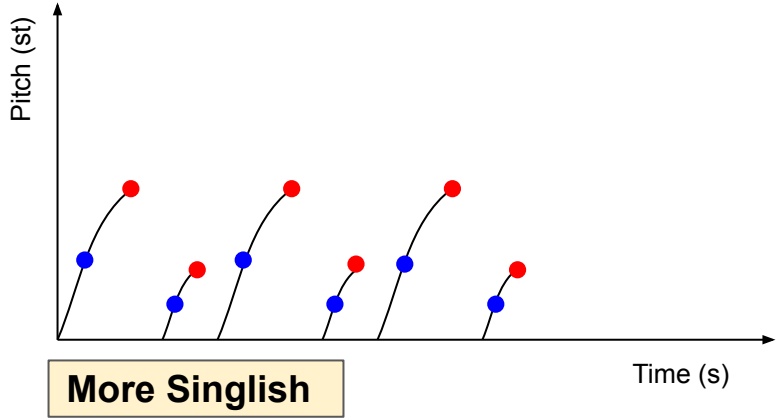
Speech was categorized as Singlish in a **gradient** way that leveraged **typicality** and prosodic features of **local pitch variability**, **global pitch variability**, and **articulation rate**.

Discussion

- Clips more likely to be chosen as More Singlish were associated with **more local pitch variability** but **less global pitch variability**
  - Ties into listeners' open-ended responses

Max: Greater difference between max pitch of adjacent vowels for More Singlish than Less Singlish
Mean: Smaller SD of mean pitch for More Singlish than Less Singlish





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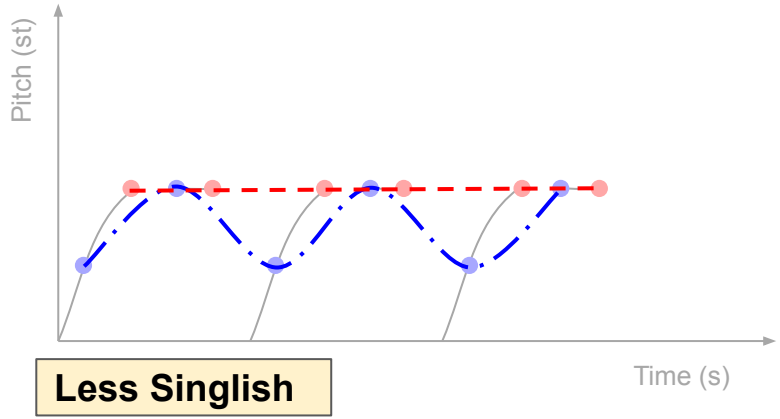

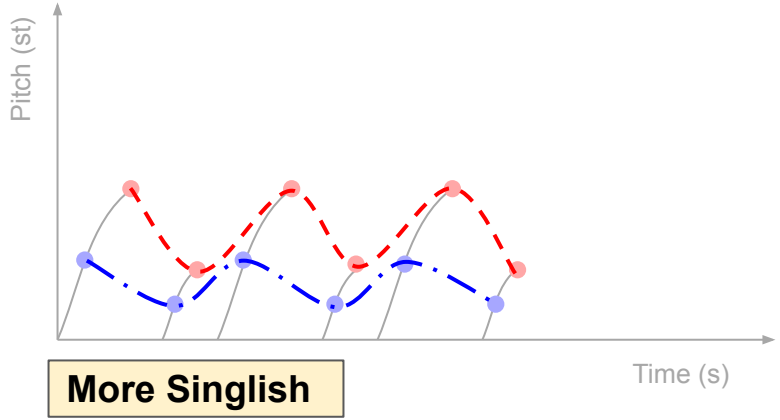

Implications

- Typicality in dialect recognition
  - How well a token is positioned relative to a specific category
- Emergent group without explicit label
  - Highlights ad hoc nature of categorization
- Local and global pitch variability
  - Capture magnitude and locality of variation in pitch
- Methodological implications
  - Exploratory methodology and listener-driven analyses

Conclusion

- Listeners mapped variation to a variety in a gradient, fine-grained manner that leveraged typicality, even when there was no explicitly provided counterpart for the variety.

- Categorizations of Singlish were associated with prosodic features of more local pitch variability, less global pitch variability, and faster articulation rate.

Thank you!

Questions? Email us!

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