Social Perception of Voice Onset Time in Singapore English

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Introduction
As a contact language with rich sociohistorical origins, Singapore English (SSE) is best characterized as a continuum that varies from Standard Singapore English (SSE) to Singlish (aka Colloquial Singapore English). Speakers of the latter draw from and mix in aspects of languages like Chinese, Malay, and Tamil. Sociolinguistically, social context often dictates when and where Singlish is used — for example, SSE, formally and Singlish, informally. This project investigates the sociophonetic nature of voice onset time (VOT) and whether it is useful as a social perceptual cue for native speakers.

Background Research:
Production of VOT in SSE
• Singaporeans vary sub-categorically in VOT when speaking to fellow Singaporeans vs. Americans (Liu 2011, n.p.)
• SSE is characterized by longer VOT; measured in conversations to Americans and also consistent with British English/RP VOT values (Docherty 1992)
• Singlish is characterized by shorter or pre-voiced VOT; measured in conversations to Singaporeans and consistent with VOT values in substrate languages, especially Malay and Tamil
• Singaporeans linguistically accommodate (Giles et al. 1991) their interlocutors (Liu 2011, n.p.)
• Change in VOT reflects shifts between SSE and Singlish

Research Questions
1. Is VOT a salient perceptual cue to how Singaporeans perceive dialect (SSE or Singlish) or social identity of another speaker?
2. Does exposure to and fluency in different varieties (Sumner & Samuel 2009) of Singlish affect perception of VOT?
3. Does education level influence perception of VOT in Singlish?

Hypotheses
• Categorical boundaries of /b/-/p/ will shift depending on how listeners perceive the social identity of a speaker
• Education may affect individual dialectal fluency as well as how they vary between SSE and Singlish on a daily basis
• Individual fluency in Singlish variants will affect categorical perception of /b/-/p/ speakers who have a wide intra-speaker dialectal range (such as university students) will demonstrate more fluidity in perceiving categorical boundaries

Participants
53 Singaporeans (ages 18 – 24), categorized based on education level
• 25 university students from the National University of Singapore
• 28 polytechnic students from various polytechnics across Singapore

Methods and Experiments
3 forced-choice tasks: participants heard stimuli and picked 1 out of 2 available answers, /b/ or /p/.

Each experiment used a 9-step VOT continuum, ranging from -80 ms to 80 ms at 20 ms intervals. Each step was presented 10 times in random order.

Experiment 1 (90 stimuli): tested baseline categorical perception with a Klatt synthesized continuum of /b/ - /p/.
Experiment 2 (90 stimuli): tested perception of word-level bath – path (/bath/ - /path/), recorded by a native Singaporean female speaker
Experiment 3 (160 stimuli): tested perception of bath-path within dialectal carrier phrases, recorded by the same native Singaporean female speaker

SSE carriers:
- He cleaned the toilet, not the bath.
- He walked the road, not the path.

Singlish carriers:
- (Hey! Go and take a bath ah!)
- Waitah! Why we take the path ah!

Results

Conclusions
• VOT is useful as a social perceptual cue, but only in isolation (as shown through Experiments 1 and 2 vs. Experiment 3).
• The results of Experiment 1 show that intra-speaker dialectal fluency/fluidity and education affect perception of /b/ - /p/. University students shift significantly later than polytechnic students (though both groups shift at 20 ms) in accepting stimuli as more /p/-like. This is consistent with previous VOT production research that showed Singlish to generally have lower VOTs than SSE (as well as other prestige forms of English such as British English or American English).
• However, once given word-level stimuli, university students experienced a categorical boundary shift, suggesting that even a bit of dialectal context (provided through the native speaker productions of /bath/ and /path/) facilitated a type of perceptual undershooting. Post hoc comparisons show only university students to be perceptually undershooting.
• Only university students appear to be sensitive to dialectal information extant at the word level (experiment 2). Polytechnic students behaved similarly across Experiments 1 and 2, suggesting education level and dialectal exposure is important in regards to perceptual sensitivity to different dialects.
• VOT is not useful as a salient social perceptual cue if not presented in isolation (Experiment 3). At the sentence level, listeners have access to other more robust and salient social cues such as sentential intonation, discourse particles (specific to Singlish), or semantic meaning that renders VOT less useful as an acoustic cue for dialectal perception as well as social perception of a speaker.

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Discussion
• In experiment 1 (Fig. 1), both polytechnic and university groups have a /b/ to /p/ crossover point around 20 ms. However, polytechnic students shift significantly before university students in accepting more tokens as (/p/ (F(1, 51) = 20.68, p < .00)
• In experiment 2 (Fig. 2), when given word-level stimuli spoken by a native Singaporean, the university students shift earlier than polytechnic students at 20 ms (F(1, 51) = 5.67, p < .05 at 20 ms) — in contrast to experiment 1
• In post hoc comparisons of experiments 1 and 2 (Fig. 3), polytechnic students demonstrate a similar perceptual curve, regardless of stimuli. Rather, the university students are the group that change across experiments.
• In experiment 3, groups did not respond differently from each other to the stimuli. In regards to the factor of Dialect, only responses to the “path” carrier were significant. (Significance was tested within the range of categorical shift for each carrier: “bath” at 0 – 60 ms; “path” at 60 – 80 ms)
• Listeners responded to hearing many more /path/-like tokens for the SWE carrier than the Singlish carrier. This trend does not support previous research on VOT production data (SSE was predicted to have been more /path/-like in the –80 – 0 range)