The effect of lexical stress on the phonetic realization of voicing contrast in Tagalog:
Native and Heritage Comparison

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Effect of Lexical Stress on VOT

- Long-lag VOT [p^h t^h k^h] : Stress lengthens VOT
- Short-lag VOT [p t k] or [b̥ d̥ g̥] : No consistent effect
- Lead VOT [b d g]: Stress lengthens prevoicing

(Lisker and Abramson 1967, Cho and Keating 2002, Cole et al. 2003, Kim et al. 2014, Cho and McQueen 2005, Simonet et al. 2014)

Heritage speakers

- Heritage speakers are bilingual speakers who grew up hearing a minority language within the home and are also dominant in the majority language of the wider community (Polinsky, 2011).
- Previous studies on VOT of Heritage languages
  - Comparable to the monolingual norm (Knightly et al. 2003, Chang et al. 2011, etc.)
  - Assimilation to the dominant language stops over generations (Hrycyna et al. 2011)

Tagalog

- "Prevoicing" type
  : Short-lag VOT [p t k] vs. Lead VOT [b d g]
- Stress is signalled by pitch and/or duration (Schachter & Otanes, 1972)

English

- "Aspirating" type
  : Long-lag VOT [p^h t^h k^h] vs. Short-lag or Lead VOT [b̥ d̥ g̥] ~ [b d g]
- Stress is signalled by pitch, duration, intensity (Ladefoged, 2003)

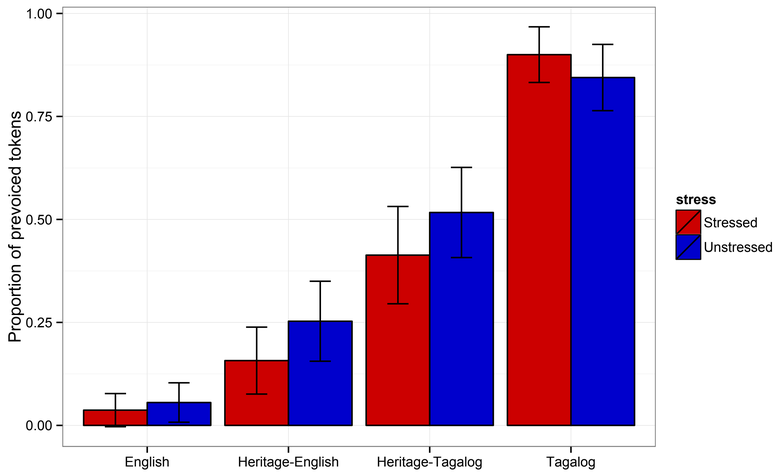
Goals of the study

- Examine the VOT of Heritage Tagalog speakers in Toronto
- Effect of stress on VOT under language contact
  - If and how do the monolingual English and monolingual Tagalog speakers differ from each other?
  - If and how do the two languages of the Heritage speakers differ from each other?
  - If and how do the two languages of the Heritage speakers differ from their monolingual comparisons?

Methods

- Speakers
  - Heritage Tagalog speakers (5M, 5F)
  - Monolingual comparisons: English (5M, 5F), Tagalog (5M, 5F)
- Speech materials (English and Tagalog)
  - Bisyllabic words with initial stops (/p t k b d g/)
  - Initial stress ("stressed") vs. final stress ("unstressed")
  - 3 repetitions in isolation x 6 stops x 2 stress positions
- Acoustic measurements: VOT, (f0, vowel duration)
- Statistical analyses: mixed effects models
  - VOT ~ stress * group + (stress | speaker)+(1 | stop)
  - Voiceless stops: VOT as continuous variable
  - Voiced stops: VOT as binary variable (prevoicing or not)

Voiced stops: Proportion of prevoicing



Main effect of Language/Group on prevoicing:
English < Heritage English < Heritage Tagalog < Tagalog

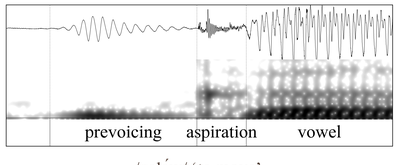
- English Monolingual:
  - Almost no prevoicing
  - No discernible effect of stress
- English by Heritage speakers:
  - More prevoicing than monolinguals
  - *Stress tends to reduce prevoicing (but, n.s.)*
- Tagalog Monolingual:
  - Almost always prevoiced
  - *Stress tends to increase prevoicing (but, n.s.)*
- Heritage Tagalog:
  - Less prevoicing than monolinguals
  - *Stress tends to reduce prevoicing (but, n.s.)*

Prevoiced aspirates ("mixed")

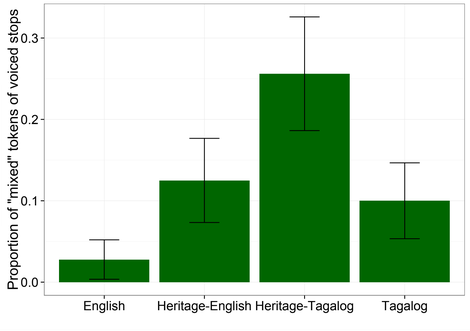
- A number of prevoiced stop tokens are produced with both prevoicing and aspiration, or the prevoicing tapered off well before the stop release.

(cf. Van Alphen and Smits 2004, Caverlé 2014)

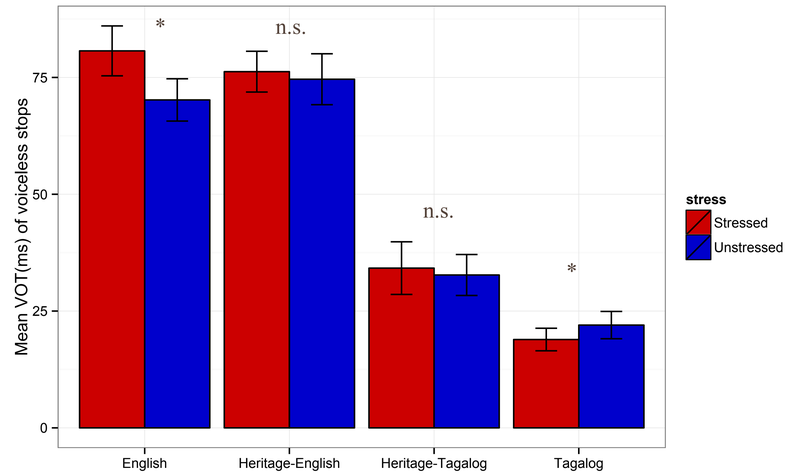
- **Greater proportion of "mixed" tokens are produced by Heritage Speakers.**



/galáw/ 'to move'
produced by a Heritage female speaker



Voiceless stops: Average VOT duration



Main effect of Language/Group on VOT:
English ≈ Heritage English > Heritage Tagalog > Tagalog

- English Monolingual:
  - Long-lag VOT
  - Stress ***lengthens*** VOT
- English by Heritage speakers:
  - Long-lag VOT, comparable to monolinguals
  - *Stress has no effect on VOT*
- Tagalog Monolingual:
  - Short-lag VOT
  - Stress ***shortens*** VOT
- Heritage Tagalog:
  - Short-lag VOT, but significantly longer than monolinguals
  - *Stress has no effect on VOT*

Summary

- Overall VOT: The two languages of heritage speakers mirror the patterns in the monolingual norms.
  - Voiced stops: Heritage speakers produce more prevoiced voiced stops for Tagalog than for English.
  - Voiceless stops: Heritage speakers produce English voiceless stops with long-lag VOTs and Tagalog voiced stops with short-lag VOTs.
- Stress effect: The heritage production does not mirror the subtle effect of lexical stress on VOT in the monolingual norms.
  - Voiced stops: an "emergent" trend that is not attested in either English or Tagalog norms.
  - Voiceless stops: no stress effect, unlike monolinguals
- "Mixed" pre-voicing: Heritage speakers show a greater proportion of voiced stops as a "mixed" token.

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