

Acoustics of the tense-lax stop contrast in Semarang Javanese

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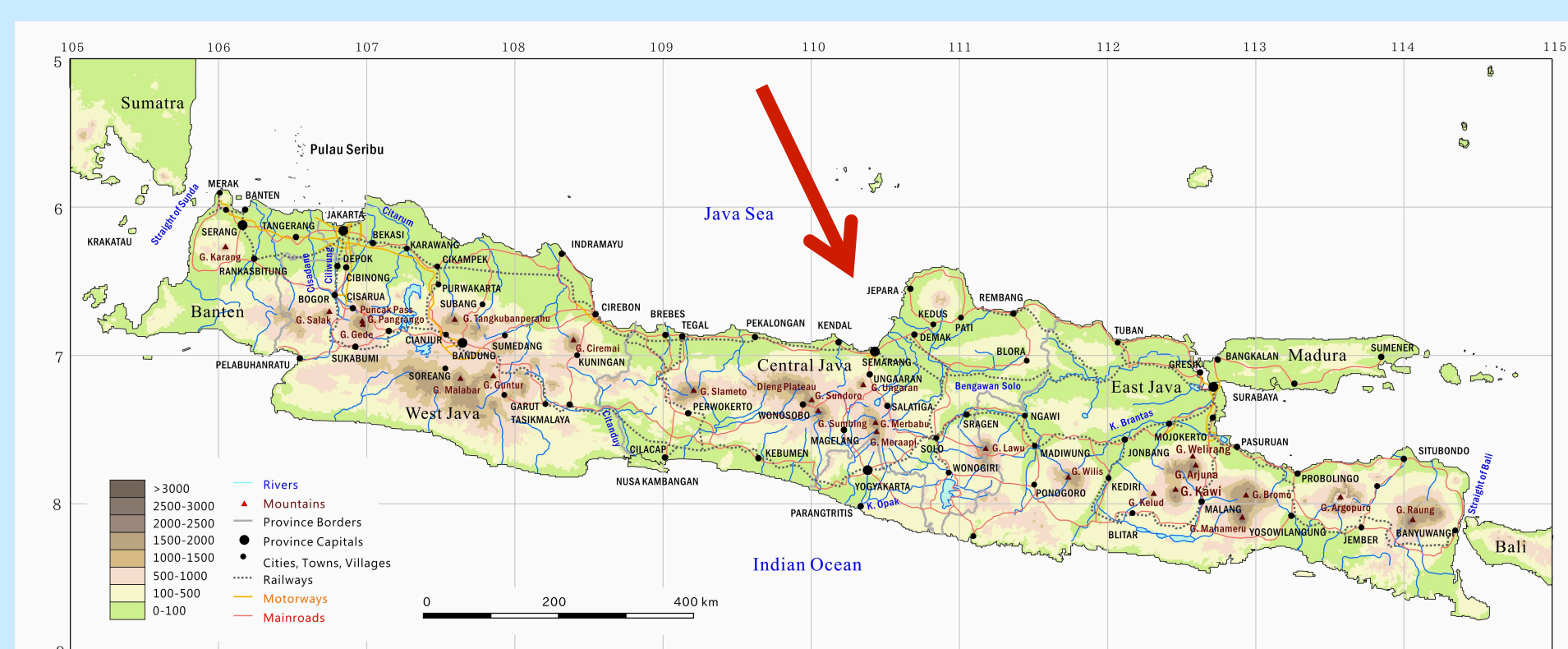
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Introduction

- Javanese contrasts tense vs. lax stops, both claimed to be voiceless unaspirated.
- Vowels after **lax** stops are reported to have:
 - Lower f0
 - Breathier voice quality (e.g., higher H1-H2, higher noise)
 - Lower F1, higher F2
- Previous findings are from small samples, and there is a lot of variability across speakers.
- Brunelle (2010): differences stem in part from larynx lowering for lax stops.
- It is still unclear whether the contrast is maintained word-finally.

Methods

- 28 speakers (22 women, 6 men) of Semarang Javanese, (results from 7 speakers shown in poster).
- Aged 19-55, various levels of dominance in Javanese vs. Indonesian.

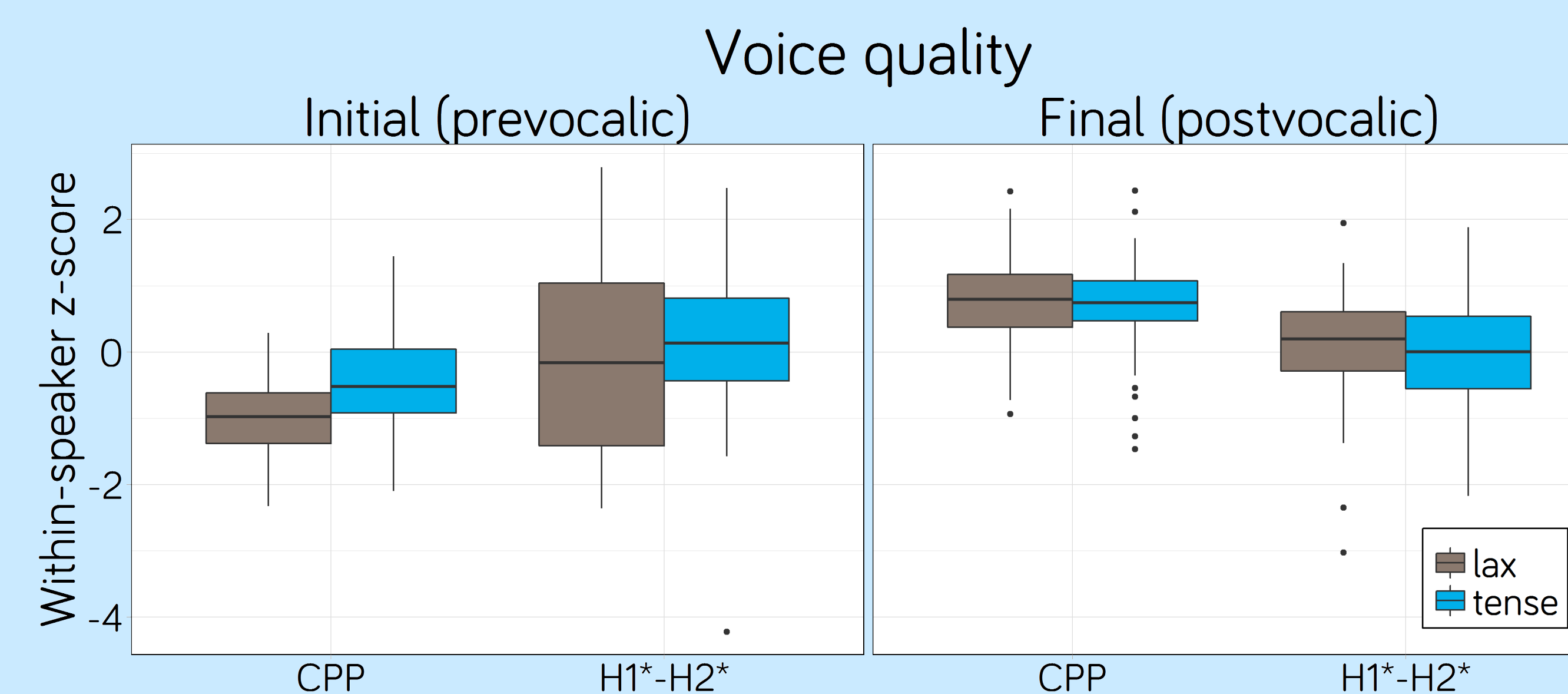
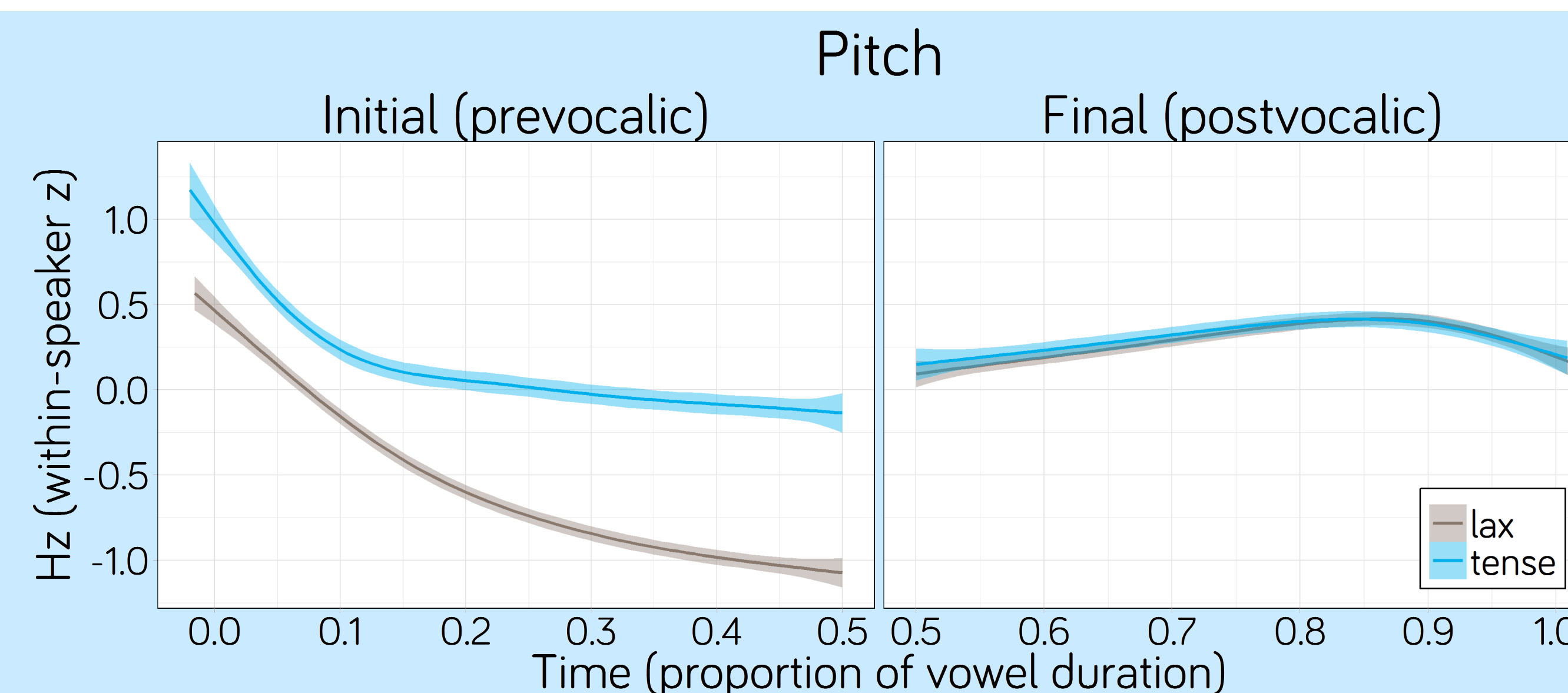


- Audio recordings of words in carrier sentence.
- Words annotated and segmented in Praat:
 - VOT, STOP CLOSURE & RELEASE, VOWEL
- Acoustic measures obtained using VoiceSauce:
 - F0
 - H1*-H2* (higher if breathy) and CPP (lower if breathy)
 - F1, F2, B1 (higher B1 if breathy)

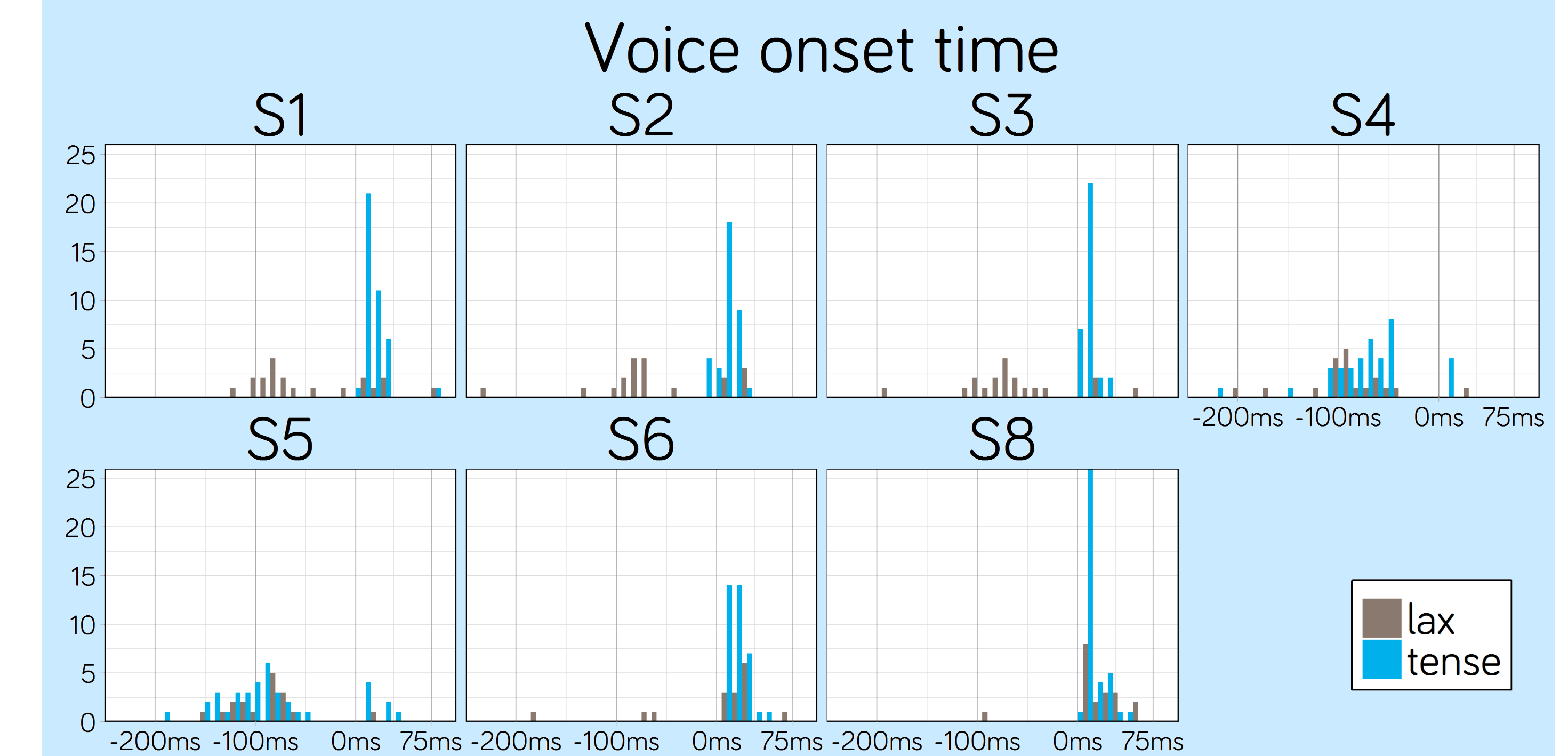
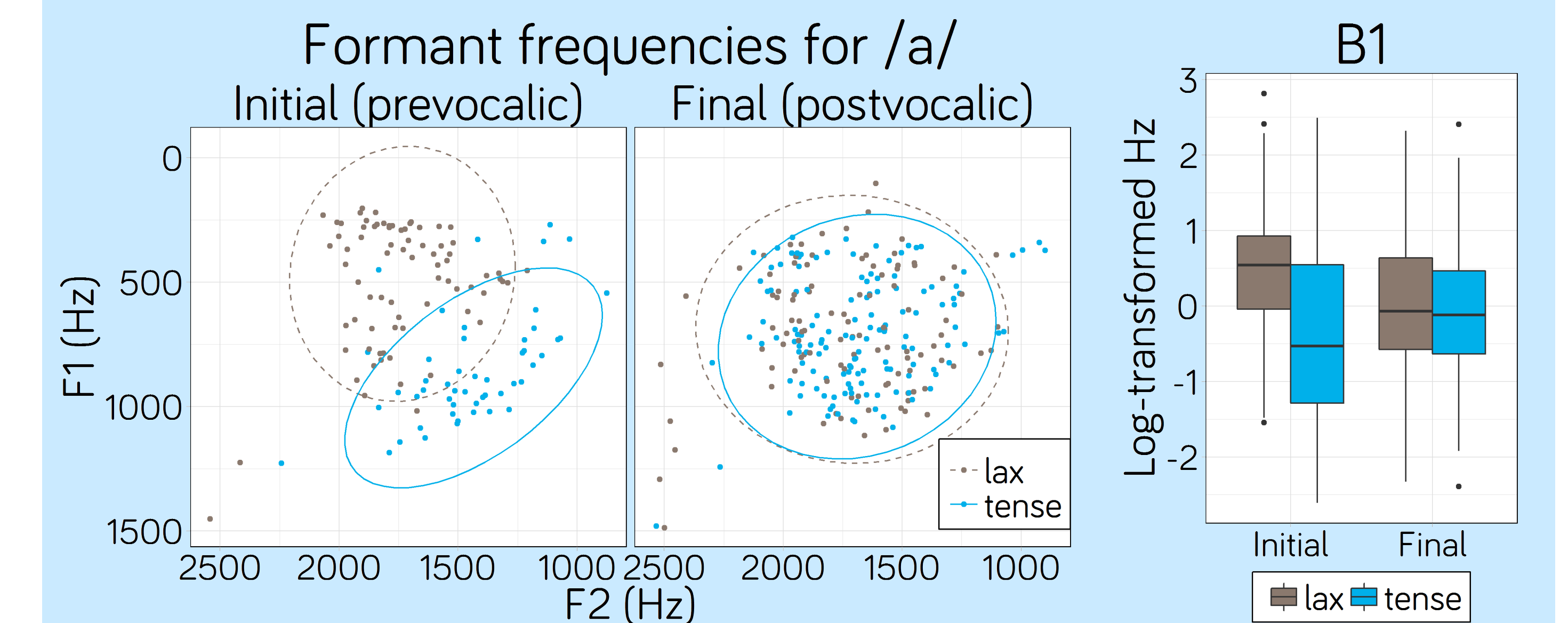
Research questions

1. How is the tense-lax contrast realized?
2. Is the contrast neutralized word-finally?

F0 and voice quality



Vowel quality and VOT



- S1, S2, S3: initial lax stops generally have lead VOT while tense stops have lag VOT.
- For other speakers, VOT can be lead (S4, S5) or lag (S6, S8), **regardless** of stop type.

Discussion

- Tense-lax contrast driven by f0 and vowel quality (especially F1). **No evidence of tense-lax differences word-finally.**
- Initial lax stops have lower CPP and higher B1 → **breathy quality** driven by noise and formant characteristics.
- Results somewhat consistent with **larynx lowering** for lax stops, but puzzles remain: *Why doesn't larynx lowering lax favor prevoicing? What is the relationship between larynx lowering and breathy voice?*

References

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