

Prosodic patterns of code-switched speech



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■ Introduction

- Code-switching (CS) – the use of features of more than one language (lexical, grammatical) in an utterance
- Prosody – the phonetic elements which make the larger units of speech – intonation, stress, pitch, etc.
- Insertions (1) and alternations (2) in Bulgarian-English CS utterances:

(1) bila sum na vsichkite *ride-ove*
been.3sg.f.past on all.def ride.pl.def
'I have been on all the rides.' (PAR19_1EN)

(2) edin chovek po sredata koito e mnogo *excited to be there*
one person on middle.def who is very excited to be there
'a person in the middle who's very excited to be there' (PAR2_4EN)

- Prosodic cues believed to exist before CS and affect recognition [1,3,4,5,6] but the lack of research has yielded inconclusive results
- These prosodic effects have never been investigated in Bulgarian-English CS utterances

■ Research question

Are there prosodic cues preceding a CS in Bulgarian-English utterances which can be used by the listener to predict an upcoming switch?

■ Methodology

- Pre-existing Bulgarian-English CS corpus [2]
- 15 interviews by fluent bilingual speakers (female = 12, mean age = 23) with high exposure to English, based in English-speaking countries
- Syntactically similar CS and unilingual Bulgarian sentences were selected for comparison – CS and unilingual equivalent (UE)

(3) vse edno e na telefona
like is.3sg.prs on phone.def
'like he's on the phone' (PAR3_14)

(4) vse edno e vuv social media ili text-va nyakoi
like is.3sg.prs in social media or text.3sg.prs someone
'like he's in social media or is texting someone' (PAR3_15EN)

- Prosodic cues before CS analysed with PRAAT:

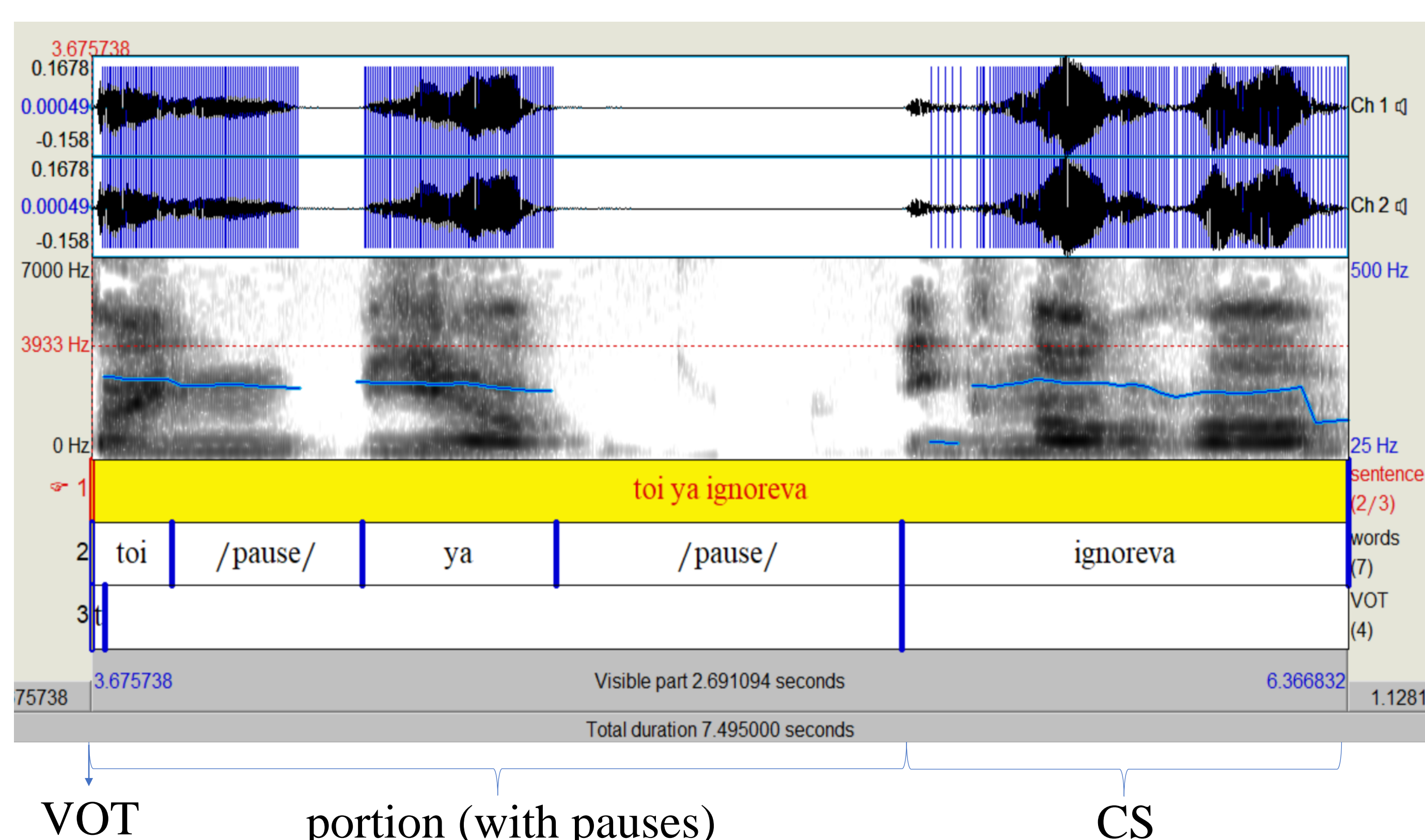
Fundamental frequency (f0) – 78 data points

Speech rate – 78 data points

Voice onset time (VOT) – 58 data points

Disfluencies excluded from the analysis

$$\text{Speech rate} = \frac{\text{duration portion}}{\text{syllable portion}}$$



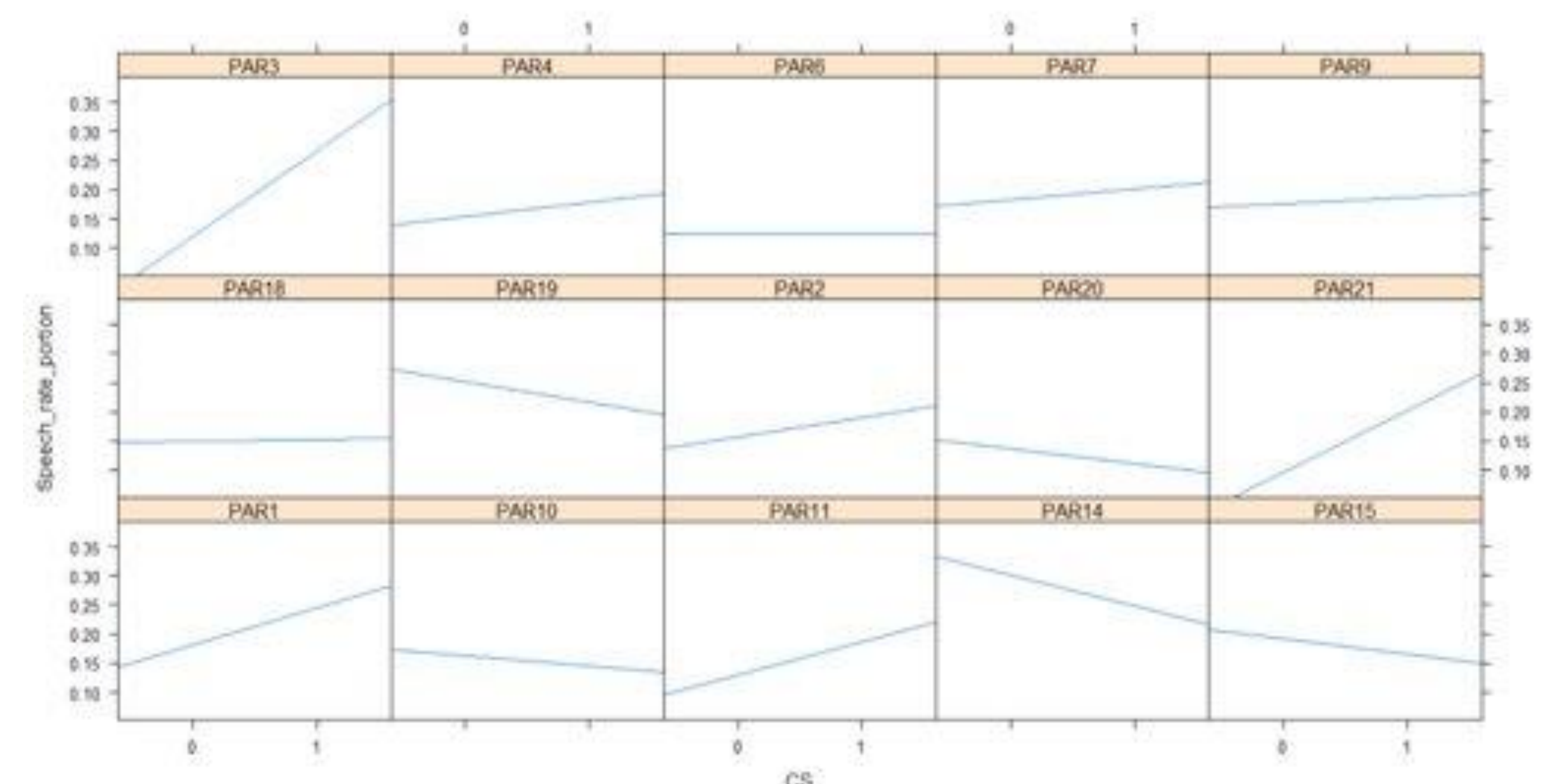
■ Results

F0

- Similar f0 of CS (201.97 Hz) and UE (203.93 Hz)
- Lower f0 before CS (197.70 Hz) and higher f0 before UE (211.47 Hz) could suggest a cue

Speech rate

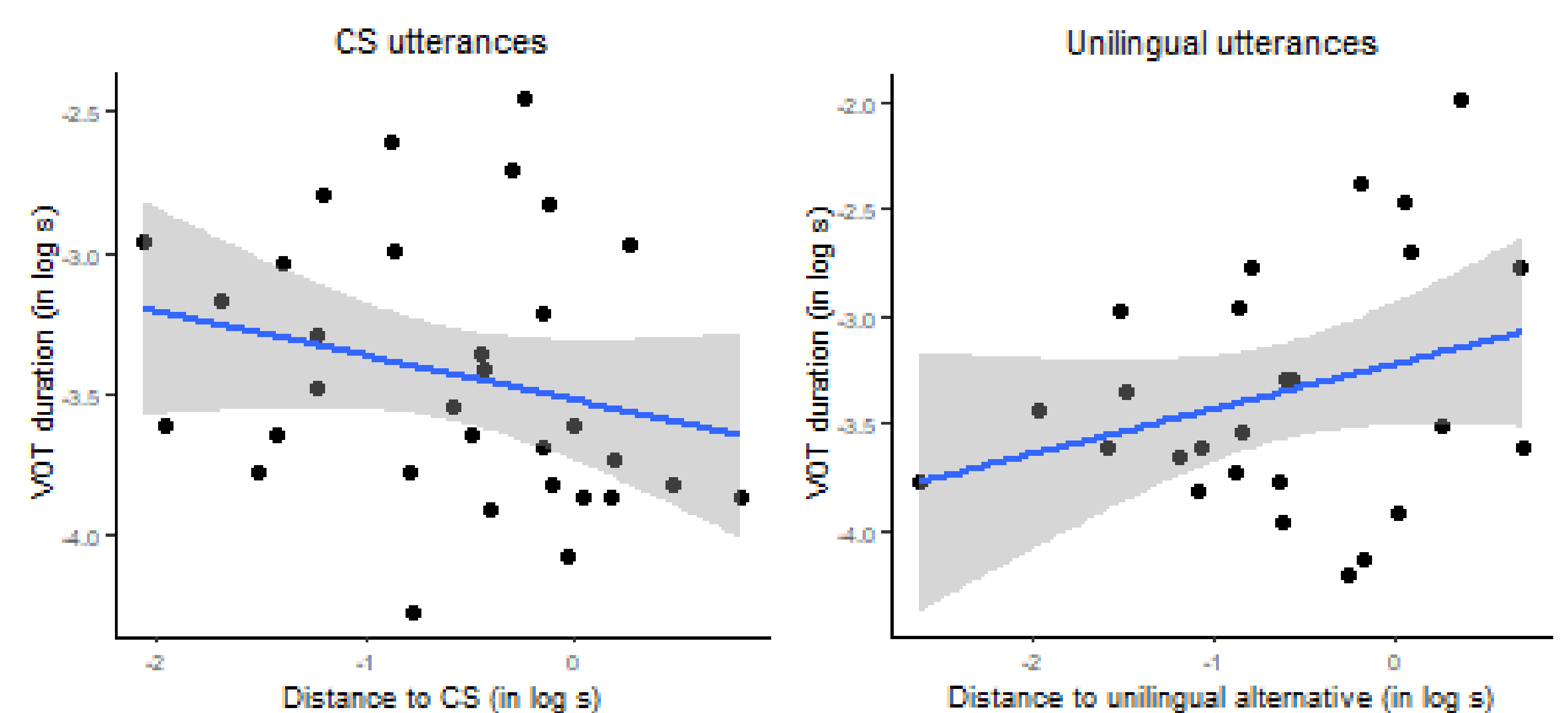
- Slower speech rate before CS nouns (p = 0.004)
- Slower speech rate before CS (p = 0.034)



Individual differences in speech rate in CS (1) and unilingual (0) utterances.

VOT

- VOT slightly shorter in CS utterances (33 ms vs. 46 ms)
- No effect of CS or plosive, nor an interaction between the two



■ Conclusion and Limitations

- A cue was found in CS utterances:
 - higher f0 preceding a CS
 - slower speech rate
 - shorter VOT
- Not large enough dataset but a trend is seen regardless

■ References

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