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Tonal coarticulation in Mandarin-English code-switching

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Tonal coarticulation in Mandarin-English code-switching

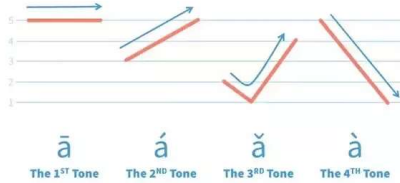
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PhREND 2019

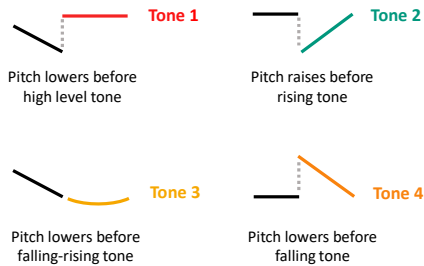
Background

Mandarin lexical tones



Mandarin tonal coarticulation

Mostly dissimilatory anticipatory effects, except Tone 3 assimilatory (Xu, 1997)



Phonetics of code-switching

Code-switched utterances may display distinct phonetic characteristics, cf. unilingual utterances

e.g. Spanish-English code-switched sentence prosody distinct from unilingual Spanish/English sentence prosody (Piccinini & Garellek, 2014)

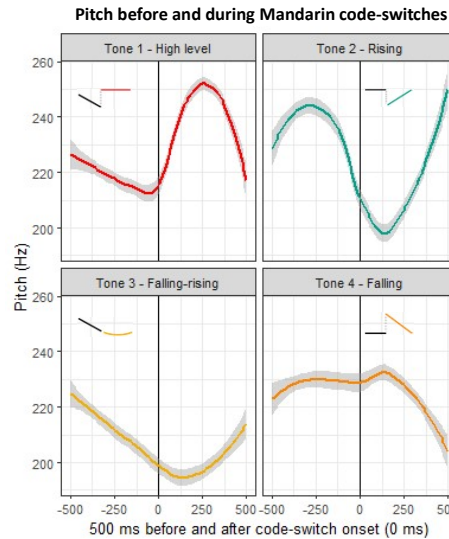
→ Code-switching affects phonetic production

Selected references

Piccinini, P. E., & Garellek, M. (2014). Prosodic cues to monolingual versus code-switching sentences in English and Spanish. In *Proceedings of the 7th Speech Prosody Conference* (pp. 885-889).
Shen, A., Gahl, S., & Johnson, K. (to appear). Didn't hear that coming: effects of withholding phonetic cues to code-switching. *Bilingualism: Language and Cognition*.
Xu, Y. (1997). Contextual tonal variations in Mandarin. *Journal of Phonetics*, 25(1), 61-83.

Question: How is tonal coarticulation affected by code-switching?

Speaker 1 Mandarin-English 'balanced' bilingual (21yo, F) recorded 58 unilingual and 58 code-switched English sentences



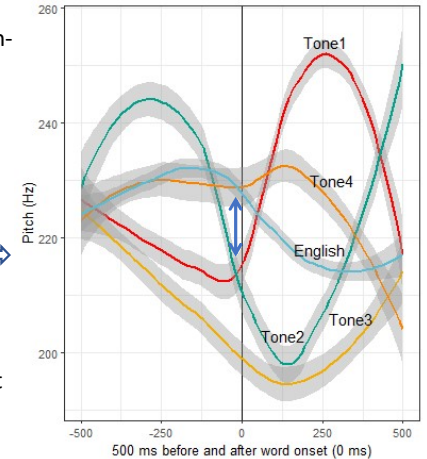
Acoustics

Anticipatory pitch coarticulation preceding English-to-Mandarin code-switch matches tonal coarticulation found in unilingual Mandarin, except Tone 4

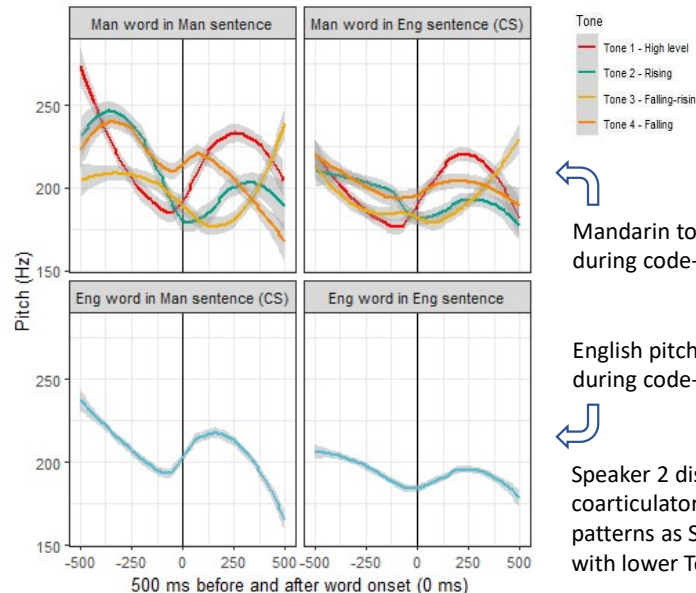
Pitch before Mandarin code-switch **distinct** from pitch before English word, except Tone 4

Pitch as perceptual cue?
In an eye-tracking study, bilinguals looked significantly less toward images corresponding to code-switched targets when the phonetic context preceding upcoming code-switch was withheld (Shen, Gahl, Johnson, to appear)

Pitch before and during Mandarin & English words in English sentences



Speaker 2 Mandarin-English 'balanced' bilingual (31yo, F) recorded 37 unilingual and 37 code-switched English and Mandarin sentences



Mandarin tones reduced during code-switching

English pitch amplified during code-switching

Speaker 2 displays similar coarticulatory pitch patterns as Speaker 1, but with lower Tone 2.

Conclusion

Tonal coarticulation similar in unilingual and code-switched Mandarin, for these two speakers

But degree of tonality can differ in unilingual vs. code-switched Mandarin

Production of tone/pitch affected by code-switching, reflecting interaction of bilingual phonetic systems

Future Steps

How much does this phonetic interaction depend on proportion of switches, dominant language, and individual variation?

Analyzing tone/pitch in recordings from 32 Mandarin-English bilingual speakers