

Acquisition of word-level prominence in L2 English by Canadian French speakers

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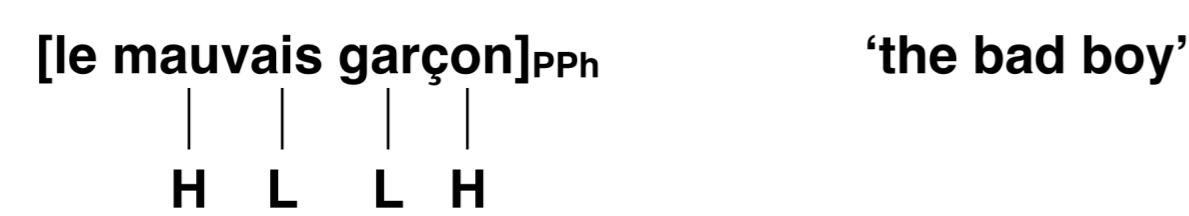
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Introduction

Prominence in Canadian French (CF)

- Property of the phonological phrase (PPh) (like European French; e.g. [1])



- Each phonological word (PWd) has final stress ([2]): [le [mau'vais]_{PWd} [gar'çon]_{PWd}]_{PPh}
- Inherently long vowels are prominent, regardless of position within PWd ([2])
 - nasal vowels (/ã, ê, œ, ÷/): [lœ'dzi] lundi 'Monday'
 - some oral vowels (/a, o, ε, ø/): [døzjɛm] deuxième 'second'
 - vowels followed by /ʒ, r, v, z/: [ʒy:ʒmã] jugement 'judgment'
- No evidence for alternating feet: (majorité)
- Stress correlated with pitch ([3]) and duration ([3], [2])

Prominence in English

- Word-level stress is relatively predictable (e.g., [4]):

Nouns:

- Default penult stress: *quality, Canada*
- Heavy penultimate syllable → penult stress: *agenda, Arizona*
- Complex final coda, light penultimate syllable → final stress: *request, review*

Adjectives and verbs:

- Heavy final syllable → final stress: *supreme, direct*
- No heavy final syllable → penult stress: *tired, accomplish*
- Primary and secondary stresses: (àca)(démic), (Àri)(zóna)
- Stress correlated with pitch ([5]) and duration ([6])

Acquisition of English stress by francophones

What they need to acquire

- Different stress positions
- Alternating rhythm

How they perform

- Preference for initial stress ([7])
- Less accurate when stress is final ([8])
- Able to discriminate words based on stress (adv learners) ([9])

Objectives

- What we know: Advanced learners can accurately place English stress
- What we want to know:

- Do these learners acquire rhythmic patterns in English?
- Do they phonetically produce stress in a target-like manner?
- Do they transfer native CF patterns into English?

Methodology

- Two production experiments

CF experiment:

- Target phrases: adj + noun, noun + prep + noun, adj + noun + adj
- Initial and final words in target phrases were measured ($n = 48$)
- Carrier sentence: *Elle a vu le candidat japonais (pendant la leçon)*
'She saw the Japanese candidate (during class)'
- Participants from Québec, ages 20-36 ($n = 6$)

English experiment

- Target phrases: adj + noun, noun + prep + noun, adv + adj + noun
- Initial and final words in target phrases were measured ($n = 374$)
- Target words with pre-antepenult ($n = 34$), antepenult ($n = 136$), penult ($n = 106$) and final ($n = 98$) stress
- Carrier sentence: *She saw an adorable musician before class*
- Two groups:
 - Advanced learners of English (same participants who did the CF experiment)
 - Native speakers of English ($n = 2$)
- Participants recorded in a soundproof booth
- French data force-aligned with Milne's SPLaligner [10] (manually checked)
- English data manually segmented
- All vowels in target words were measured for duration, F0, and intensity

Data and Results

- Accuracy in stress placement by learners: 92.6% (SD = 3.8%)
- Only accurately produced words were included in the analysis
- Data modelled using hierarchical linear regressions in R
- By-speaker random effects (vowel position) and by-item random intercept

L1 French

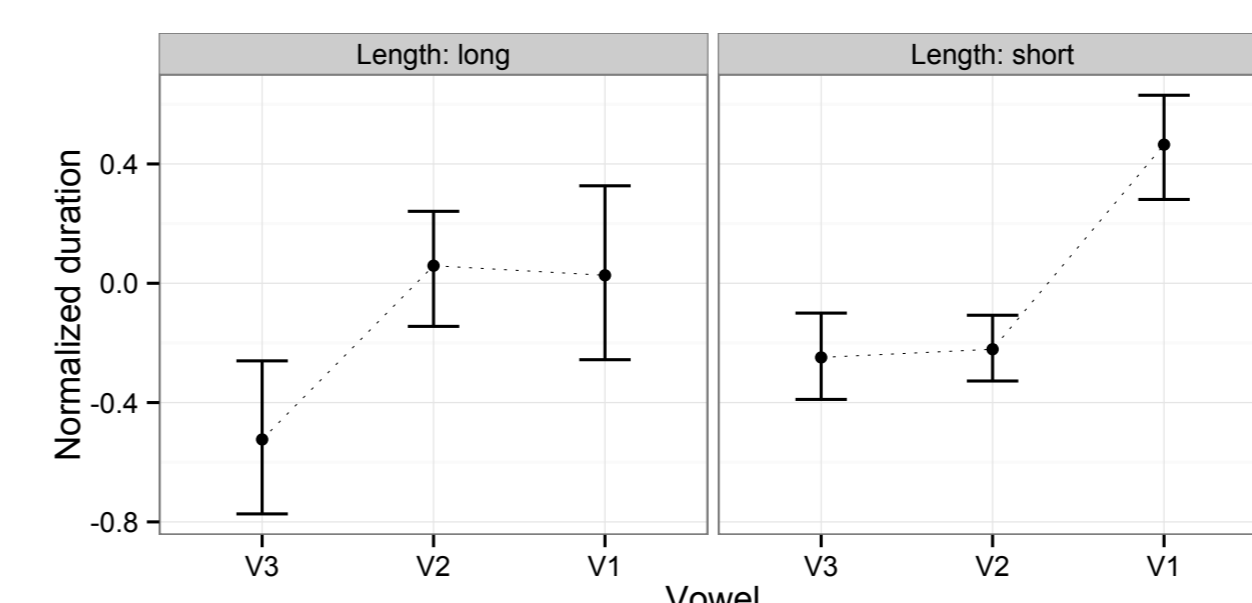


Figure 1: Normalized duration of different vowels in target words - L1 French. 'Long' and 'short' refer to V2.

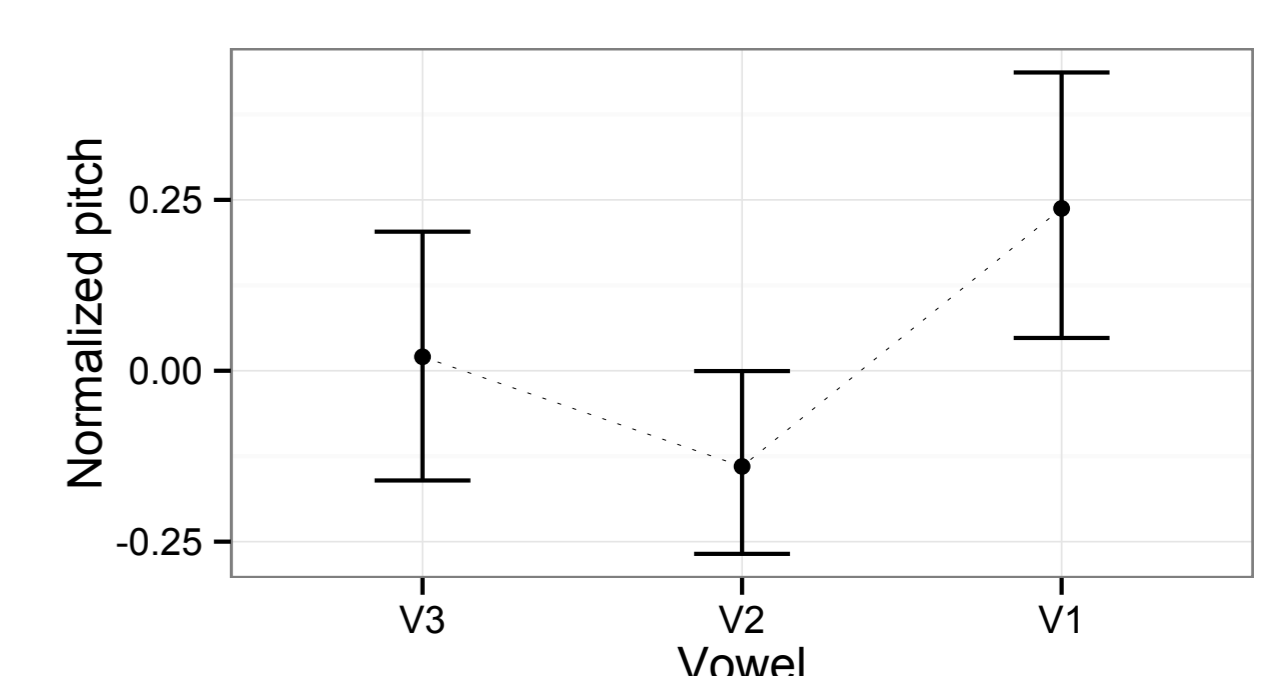


Figure 2: Normalized pitch of different vowels in target words - L1 French.

L1 English

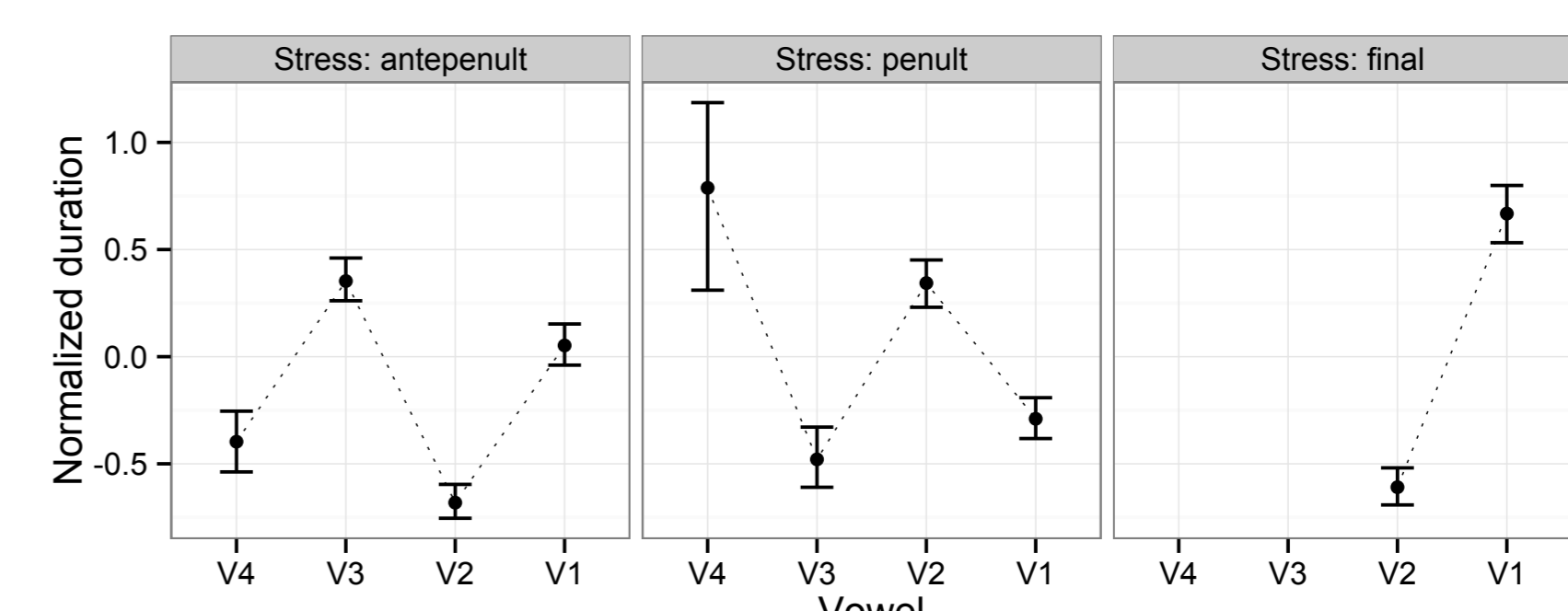


Figure 3: Normalized duration of different vowels in target words by stress position - English controls.

- Intensity follows the same pattern as duration
- No clear correlation between stress and pitch in L1 English for our data

L2 English

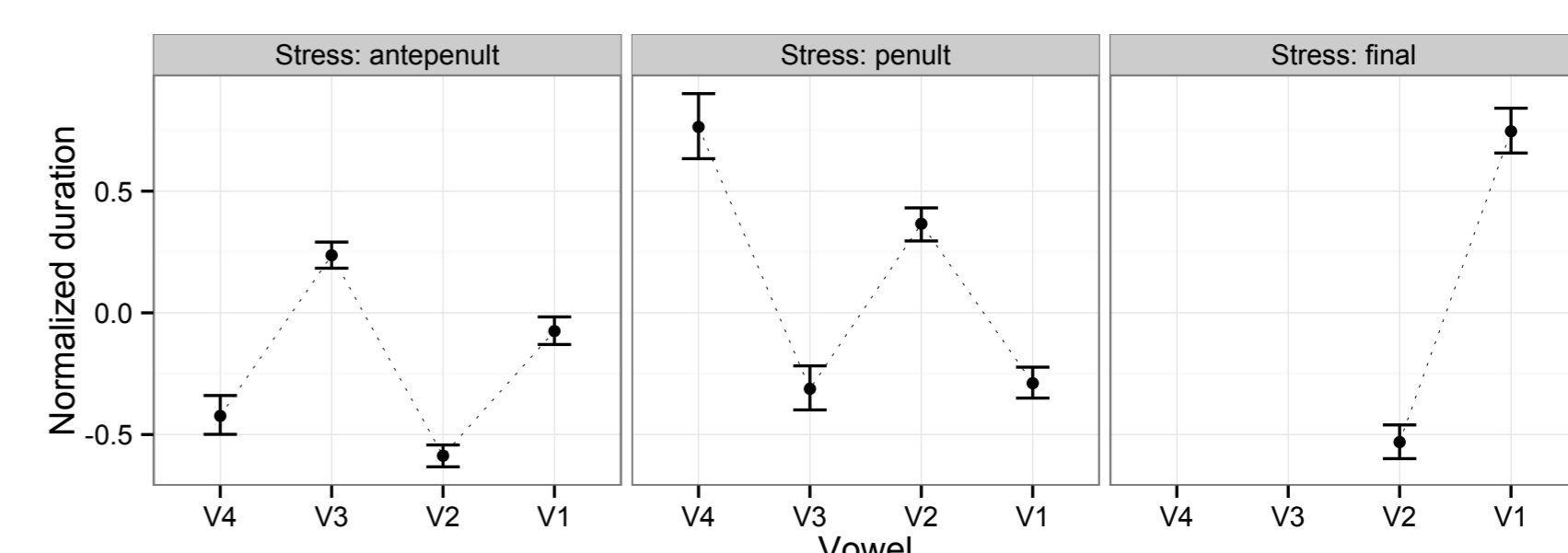


Figure 4: Normalized duration of different vowels in target words by stress position - English learners.

- Intensity also correlates with stress—but not exactly with rhythmic pattern

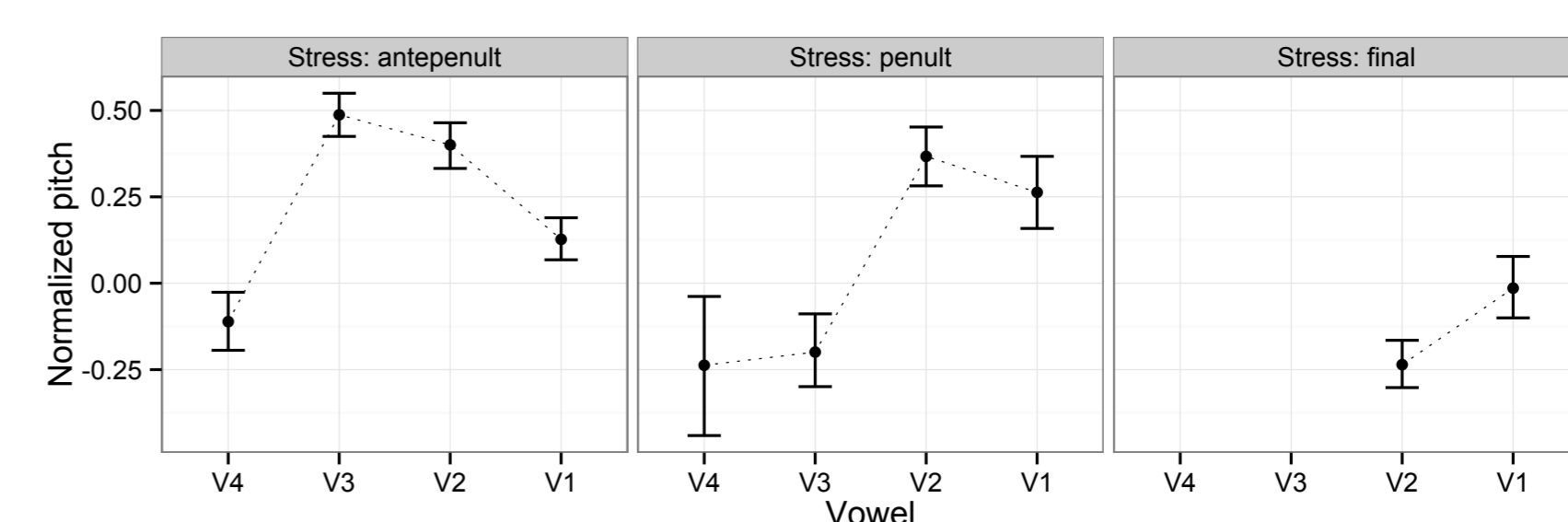


Figure 5: Normalized pitch of different vowels in target words by stress position - English learners.

Conclusions

- In our data, no evidence for any specific rhythmic patterns in L1 French, although pitch shows a trend
- Advanced learners of English are able to
 - Produce alternating rhythmic patterns
 - Use the same acoustic patterns as native speakers to signal stress (plus pitch)
- Learners adapt their prosodic representations to accommodate word-internal constituency in the L2

References

- F. Dell, "L'accentuation dans les phrases en français," in *Les représentations en phonologie* (F. Dell and J.-R. Vergnaud, eds.), pp. 65-112, Paris: Hermann, 1984.
- D. C. Walker, *The pronunciation of Canadian French*. University of Ottawa press Ottawa, ON, 1984.
- P. Garde, *L'accent*, vol. 5. Presses Univ. de France, 1968.
- M. Liberman and A. Prince, "On stress and linguistic rhythm," *Linguistic Inquiry*, vol. 8, no. 2, pp. 249-336, 1977.
- I. Lehiste, "Influence of fundamental frequency pattern on the perception of duration," *Journal of Phonetics*, vol. 4, no. 2, pp. 113-117, 1976.
- P. Liberman, "Some acoustic correlates of word stress in American English," *The Journal of the Acoustical Society of America*, vol. 32, no. 4, pp. 451-454, 1960.
- A. Tremblay and N. Owens, "The role of acoustic cues in the development of (non-) target-like second-language prosodic representations," *The Canadian Journal of Linguistics/La revue canadienne de linguistique*, vol. 55, no. 1, pp. 85-114, 2010.
- H. Altmann, *The perception and production of second language stress: A cross-linguistic experimental study*. PhD thesis, University of Delaware, 2006.
- A. Tremblay, "Is second language lexical access prosodically constrained? processing of word stress by french canadian second language learners of english," *Applied Psycholinguistics*, vol. 29, no. 04, pp. 553-584, 2008.
- P. Milne, "SPLaligner, an automatic forced alignment system for French," 2012.

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