Extending the articulatory model of tone: the case of Valjevo Serbian

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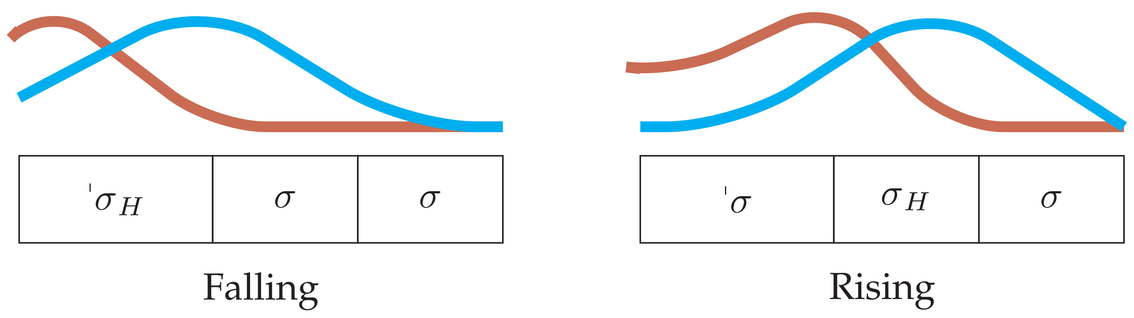
Introduction

- Investigating Serbian (srp), a pitch-accent language with two lexically specified pitch melodies, falling and rising
- Focusing on Valjevo Serbian (red contours below), which has early accentual peaks



Falling Rising

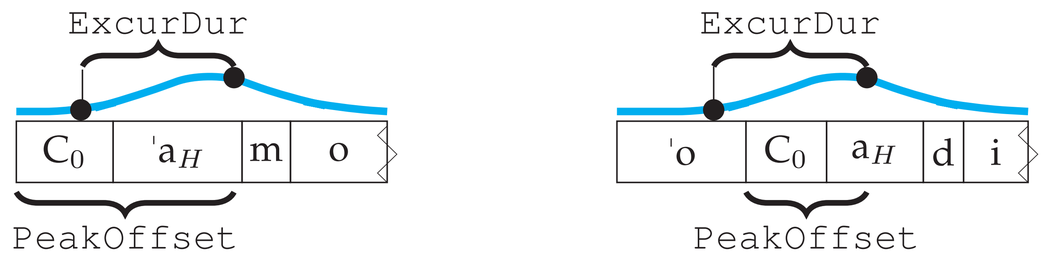
- Show that the lexical H is associated to the post-stress syllable in Valjevo Serbian rising accents
  - Supports Inkelas and Zec (1988) representation of Serbian pitch accent
  - An expanded model of tone in Articulatory Phonology can account for both phonological representation and phonetic alignment

Methodology

- Acoustic study with five native speakers of Valjevo Serbian
- Five syllable onsets on three loci of variation, read in focus structure: *Daj mi X, molim te* 'Give me X, please'

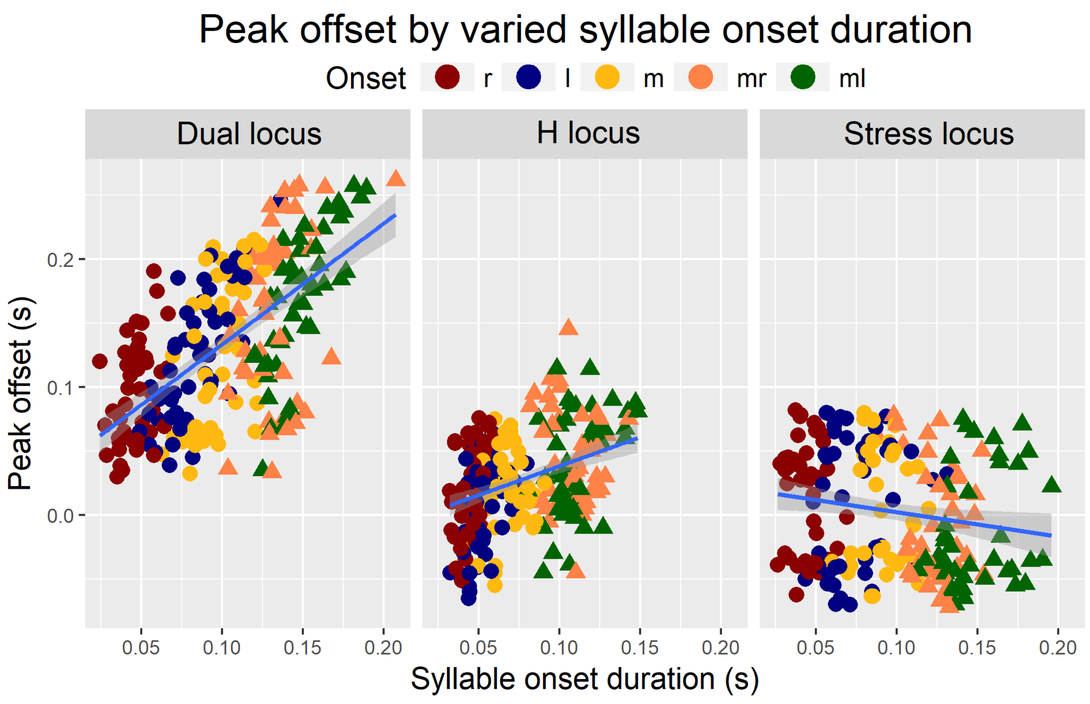
	Locus		
Onset	Dual 'C$_0$a$_H$.mo.ra	H 'o.C$_0$a$_H$.di.nu	Stress 'C$_0$a.vi$_H$.njak
r	ràmora	òradinu	ràvinjak
l	l̀amora	òladinu	làvinjak
m	m̀amora	òmadinu	màvinjak
mr	mr̀amora	òmradinu	mràvinjak
ml	ml̀amora	òmladinu	mlàvinjak

- Analyze H excursion timing relative to hypothesized H syllable



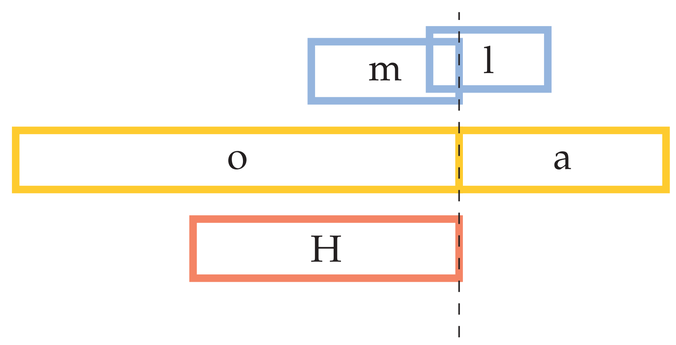
Results: H-bearing syllable onset affects pitch excursion

- The duration of the H-bearing syllable onset is a significant predictor of PeakOffset timing ($\chi^2(1) = 378.65$, $p < 0.0001$), indicating that the H in rising accents is associated to the post-tonic syllable
  - Dual, H loci: Later peaks with longer syllable onsets
  - Stress locus: Flat; slight negative relationship
  - Achieved by stretching: syllable onset duration is a significant predictor of ExcurDur for Dual and H loci ($\chi^2(1) = 54.32$, $p < 0.0001$)



- Significant effect of Locus
  - Falling peaks are later than Rising peaks ($\chi^2(2) = 782.61$, $p < 0.0001$)
  - Falling accent excursions start later than Rising accent excursions ($\chi^2(1) = 352.41$, $p < 0.0001$)
  - Indicative of different coordinative structures for each accent

Falling accent Rising accent



Gestural score of rising accent

Discussion

- Gestural representation can both reflect phonological structure and predict phonetic alignment, including apparent "misalignment"
- Gestures are underspecified for duration
  - Get timing information from the gestures they are coordinated with
  - Likely not limited to tone gestures (cf. effects of voicing on duration)
- Need to expand inventory of possible coordinative structures for tone

	Coordinative mode	**Example**
A.	In-phase	Valjevo falling
B.	Anti-phase	Thai (T2)
C.	C-center: consonant-like	Thai (T1)
D.	C-center: vowel-like	Belgrade
E.	Release to release	(not in this work)
F.	Release to c-center	Valjevo rising

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