

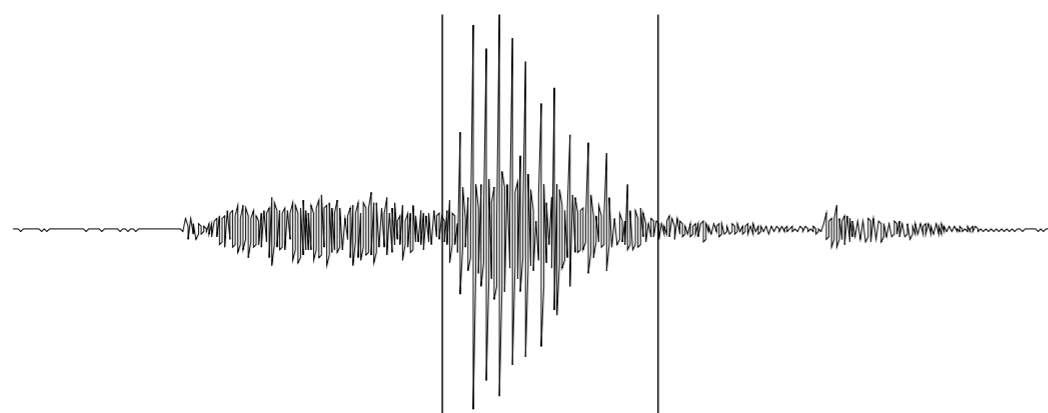
Temporal stability and compensatory adjustments

Data on the effect of voicing on vowel duration in
Italian and Polish

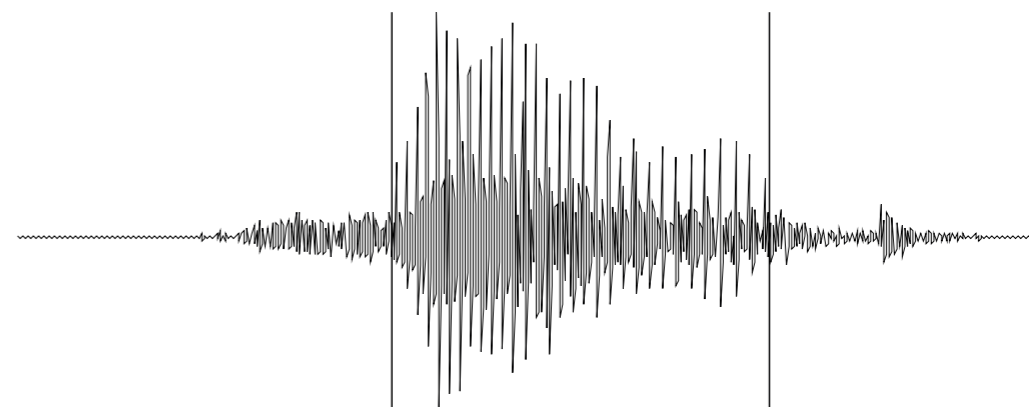
Stefano Coretta
The University of Manchester

LAGB Meeting 2019

VOICING EFFECT



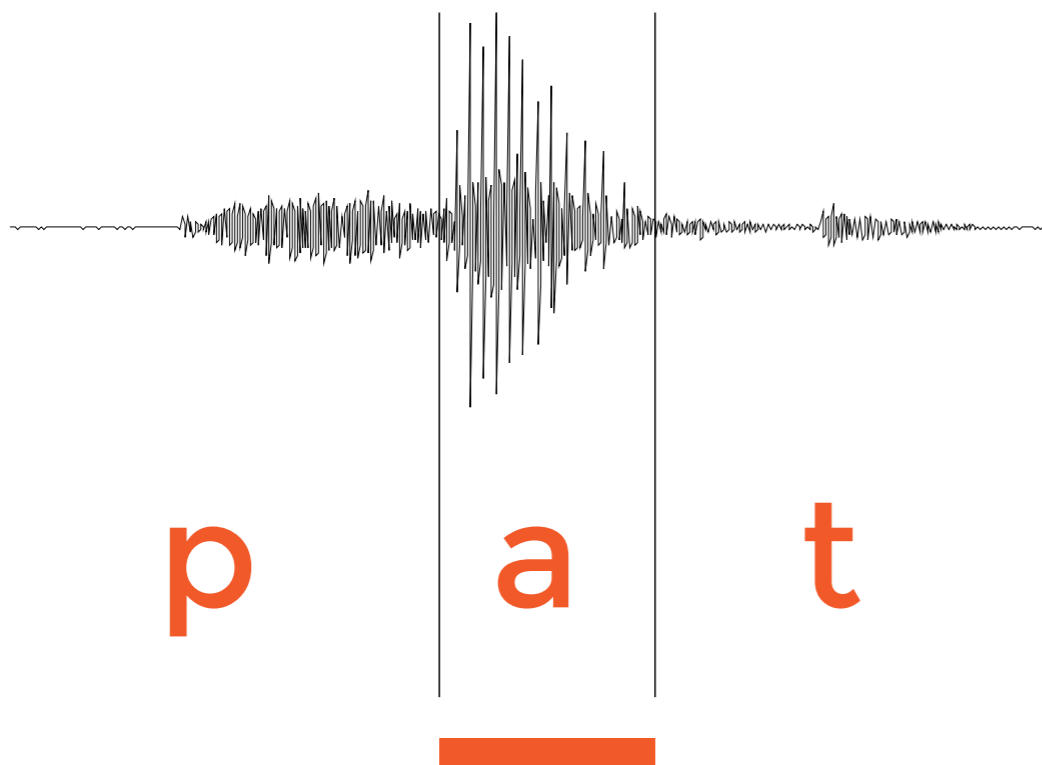
p a t



p a d

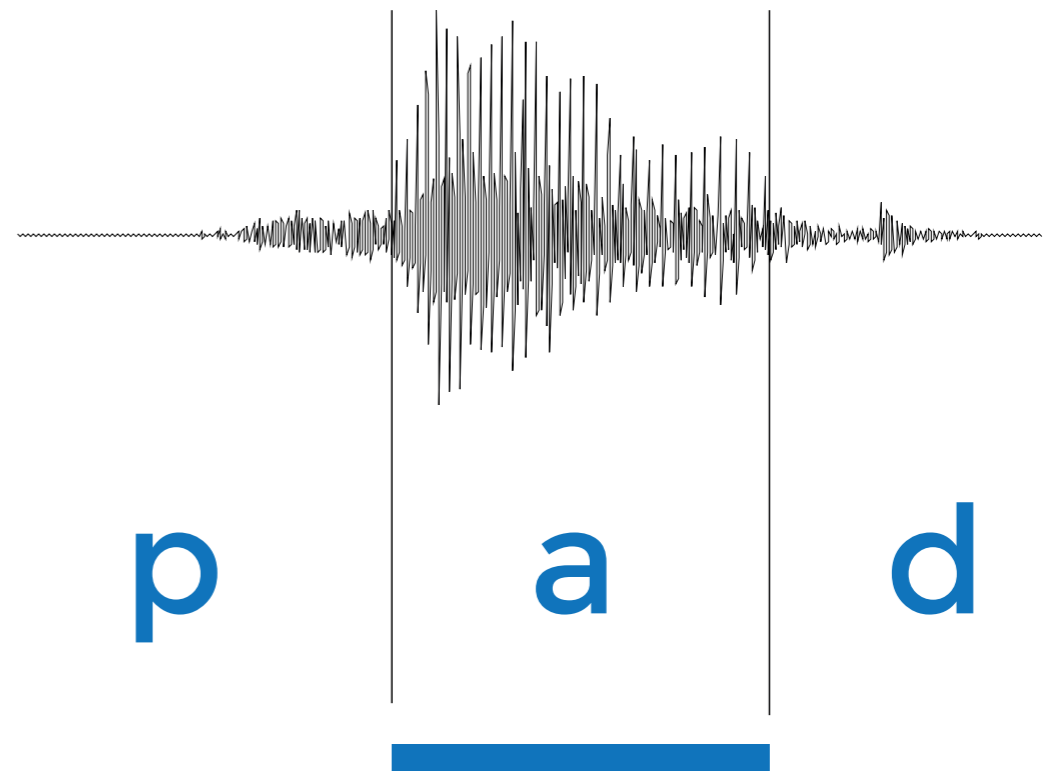


VOICING EFFECT



common

few (?) exceptions



different magnitudes

English

WHY?

Exploratory study of Italian and Polish



11



792 tokens

Dico ___ lentamente



6

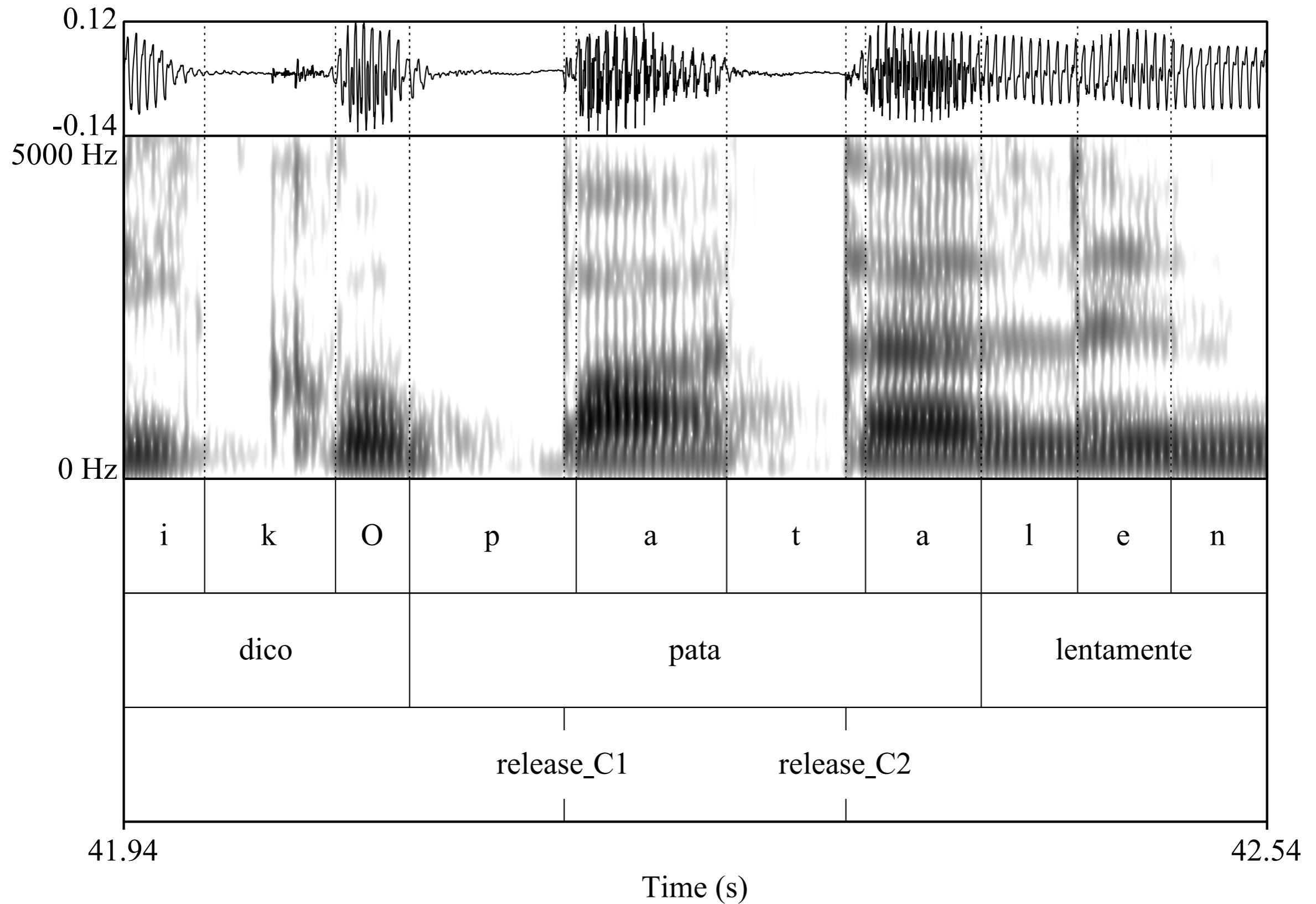


420 tokens

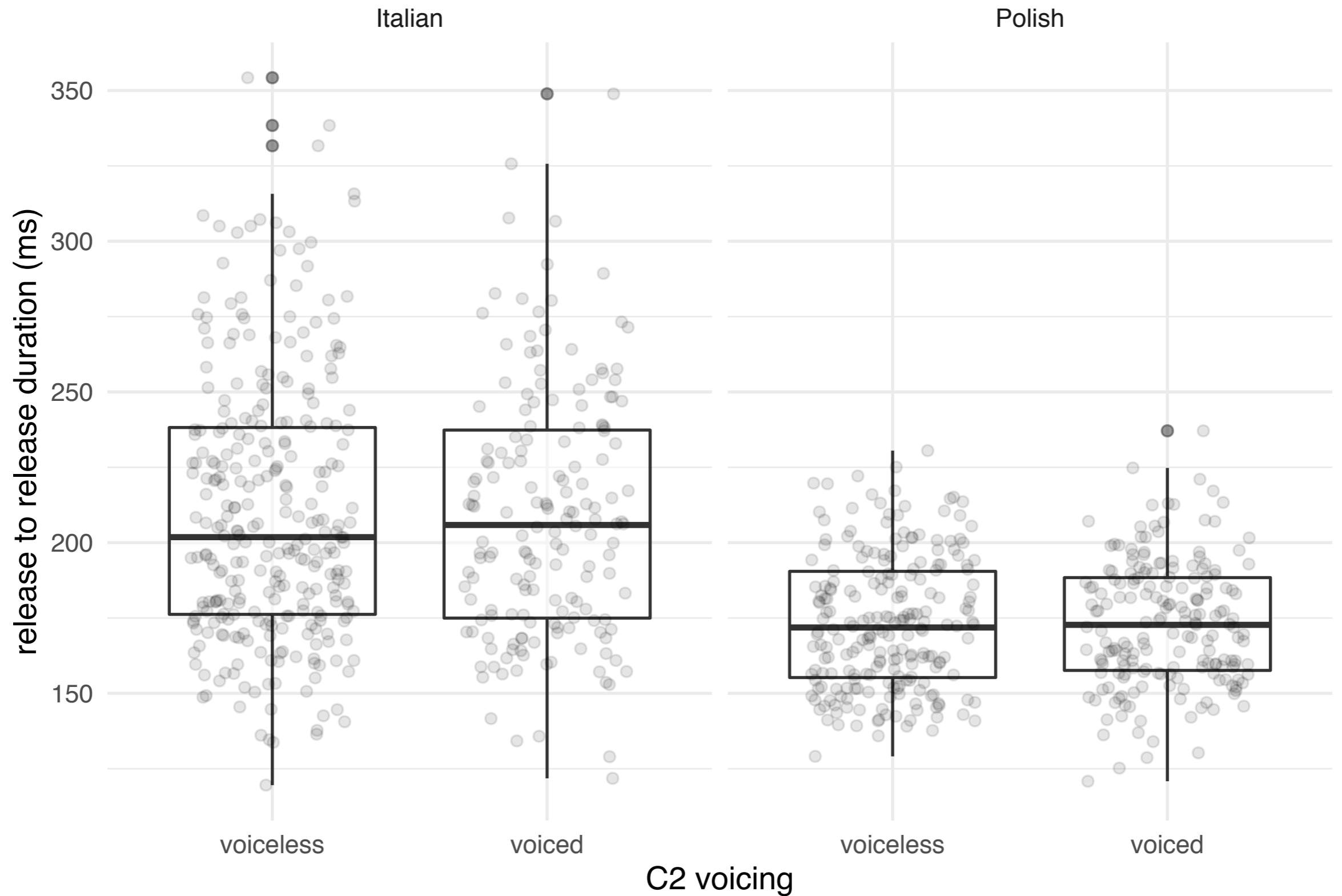
Mówię ___ teraz

c'VCV

Release-to-release interval



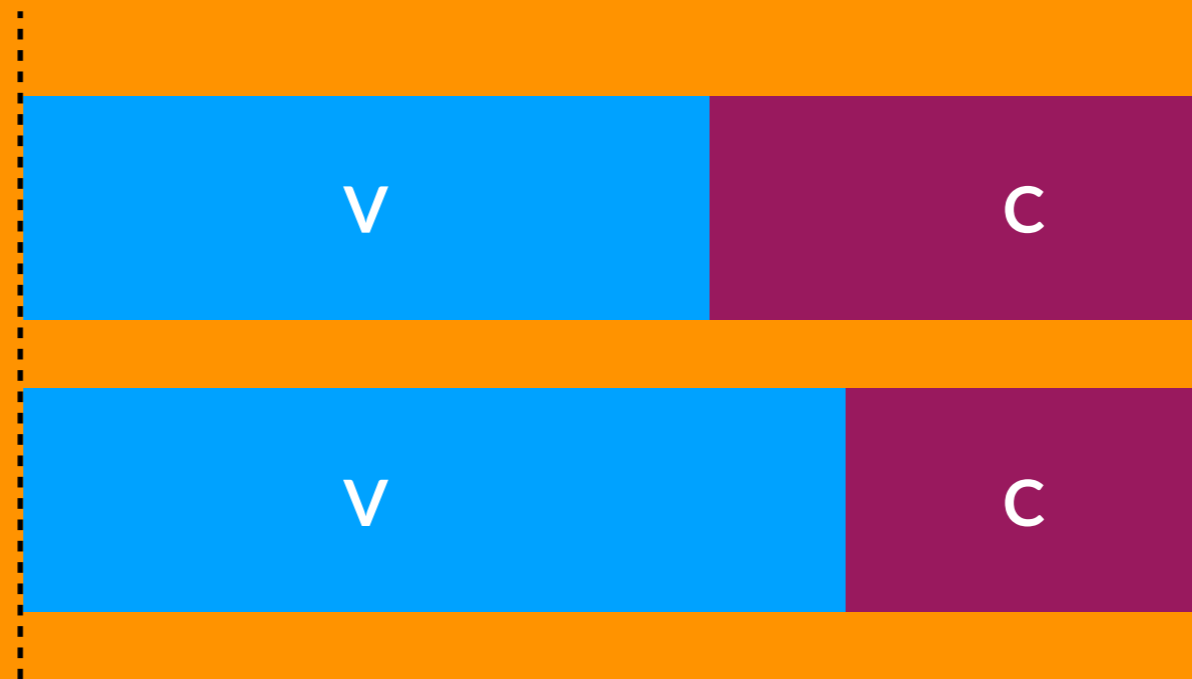
Release-to-release duration in Italian and Polish



Bayes factor for null over alternative = 21

COMPENSATORY TEMPORAL ADJUSTMENT

(Lehiste 1970, Lindblom 1967, Slis and Cohen 1969)



Effect of C2 voicing on:

Vowel duration



16.28 ms difference

95%CI = [7.62, 24.95]

Closure duration



-17.70 ms difference

95%CI = [-25.66, -9.74]

Effect of C2 voicing on:

Vowel duration



16.28 ms difference

95%CI = [7.62, 24.95]

Closure duration



-17.70 ms difference

95%CI = [-25.66, -9.74]

Effect of C2 voicing on:

Vowel duration



16.28 ms difference

95%CI = [7.62, 24.95]

Closure duration



-17.70 ms difference

95%CI = [-25.66, -9.74]

COMPENSATION

Why is there compensation?

Gestural organisation

vowel \Leftrightarrow vowel



Gestural organisation

vowel \Leftrightarrow vowel

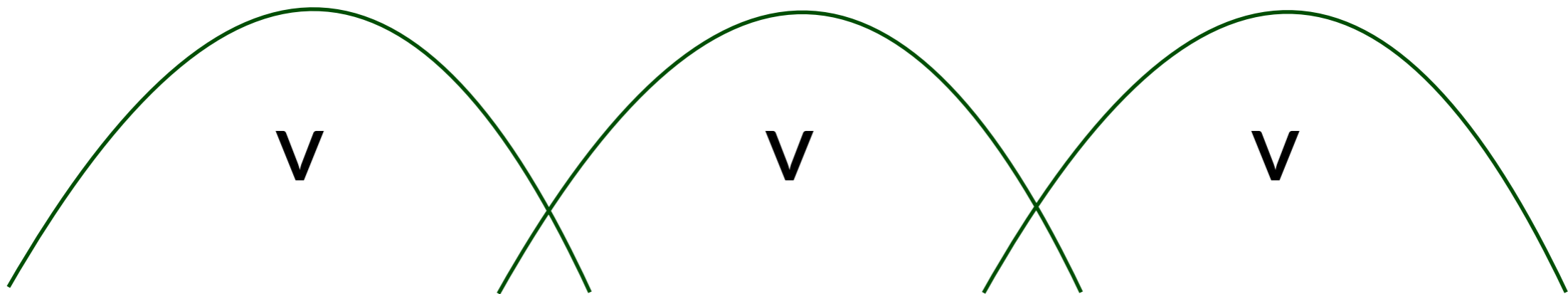


Gestural organisation



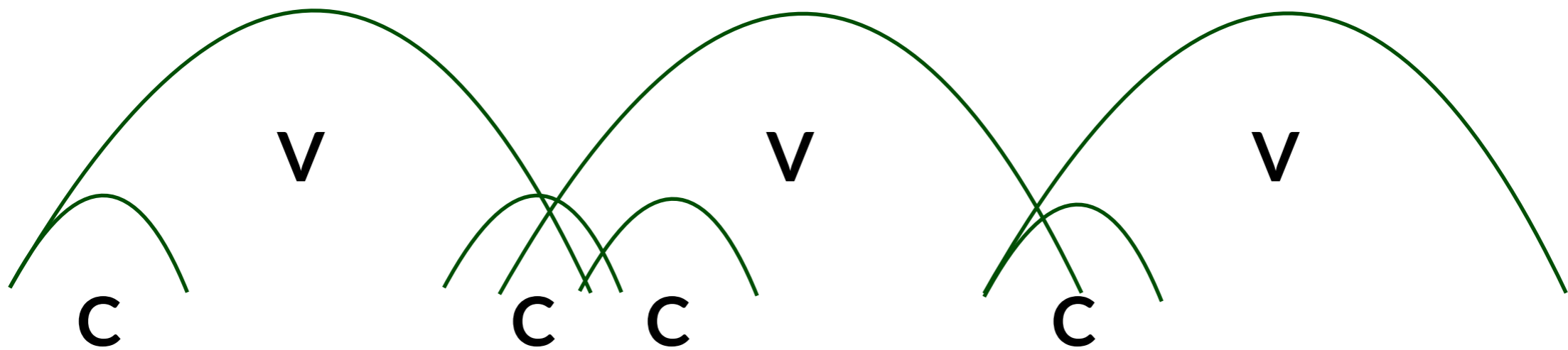
vowel \Leftrightarrow consonant

Cyclic production of vowels



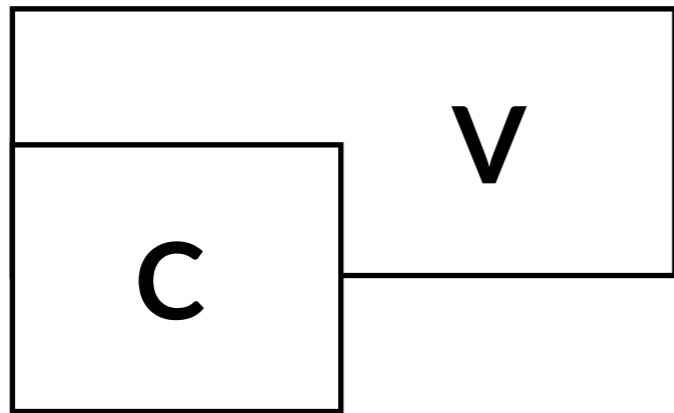
(Öhman 1966, 1967, Fowler 1983)

Cyclic production of vowels

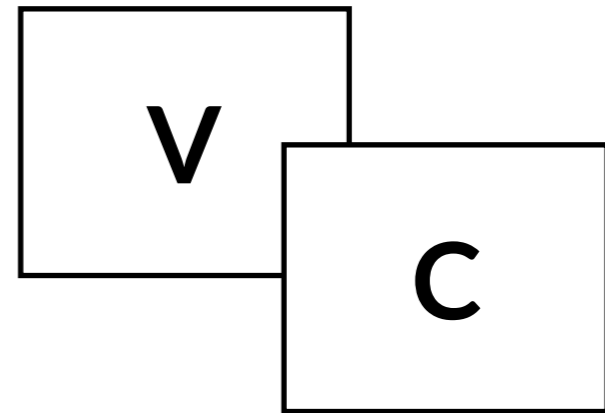


(Öhman 1966, 1967, Fowler 1983)

Coupled oscillators model



in-phase



anti-phase

V cyclicity + CV in-phase

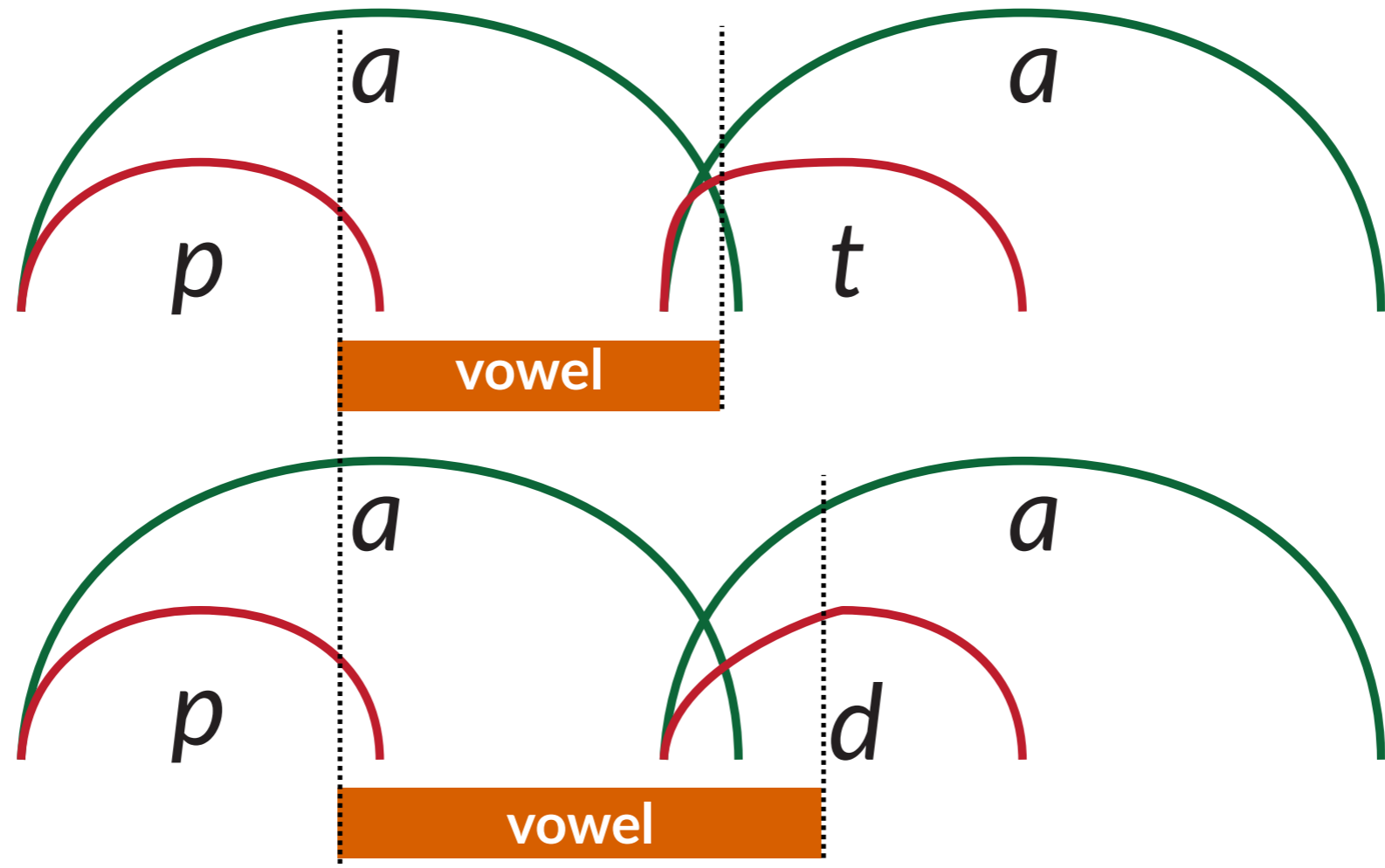


V cyclicity + CV in-phase



different closure velocity

V cyclicity + CV in-phase



different closure velocity

Further questions and work

Are the patterns seen in Italian and Polish present in English and other languages?

What about monosyllabic words?

What determines the differential closure onset?

Direct study of the temporal organisation of gestures at levels higher than the traditional syllable.

Selected references

- Fowler, Carol A. 1983. Converging sources of evidence on spoken and perceived rhythms of speech: Cyclic production of vowels in monosyllabic stress feet. *Journal of Experimental Psychology: General* 112(3). 386. doi:10.1037/0096-3445.112.3.386.
- Lehiste, Ilse. 1970. Temporal organization of higher-level linguistic units. *The Journal of the Acoustical Society of America* 48(1A). 111–111. doi:10.1121/1.1974906.
- O'Dell, Michael L. & Tommi Nieminen. 2008. Coupled oscillator model for speech timing: Overview and examples. In *Nordic prosody: Proceedings of the Xth conference*, 179–190.
- Öhman, Sven E. G. 1966. Coarticulation in VCV utterances: Spectrographic measurements. *The Journal of the Acoustical Society of America* 39(1). 151–168. doi: 10.1121/1.1909864.
- Öhman, Sven E. G. 1967. Numerical model of coarticulation. *The Journal of the Acoustical Society of America* 41(2). 310–320. doi:10.1121/1.1910340.
- Slis, Iman Hans & Antonie Cohen. 1969a. On the complex regulating the voiced-voiceless distinction I. *Language and speech* 12(2). 80–102. doi: 10.1177/002383096901200202.
- Slis, Iman Hans & Antonie Cohen. 1969b. On the complex regulating the voiced-voiceless distinction II. *Language and speech* 12(3). 137–155. doi: 10.1177/002383096901200301.