

Rhotic metathesis in CVrC and CrVC syllables: Evidence from Modern Croatian

Anaptyxis in CrC syllables as well as vowel loss and rhotic metathesis in CVrC and CrVC syllables can be modeled as perceptual confusion of full vowels and svarabhakti vowels. We show via a speech perception experiment that anaptyxis and rhotic metathesis, but perhaps not vowel loss, are indeed perceptually driven.

1 Hypotheses

- Anaptyxis with alveolar taps and trills (CrC > CVrC, CrC > CrVC) can be explained as misperception of svarabhakti vowels as full vowels by the listener (“erroneous association”; cf. [1], [2]).
- Vowel loss with alveolar taps and trills (CVrC > CrC, CrVC > CrC) can be explained as misperception of full vowels as svarabhakti vowels by the listener (“erroneous dissociation”; cf. [1], [2]).
- Rhotic metathesis with alveolar taps and trills (CVrC > CrVC, CrVC > CVrC) can be explained as simultaneous misperception of svarabhakti vowels as full vowels and of full vowels as svarabhakti vowels by the listener (“erroneous association” + “erroneous dissociation”; cf. [1], [3]).

2 Methodology

A 4AFC identification test with 113 native listeners of Croatian was conducted.

Stimuli were of the form pV₁rV₂p. Quality of V₁ and V₂ varied between the vowels [i, ε, a, ɔ, u] and the vowel [ə], respectively (5x5 steps); both vowels always had the same quality. Duration of V₁ and V₂ varied in opposite directions between 140 ms and 36 ms (5 steps).

Subjects had to choose between answers of the form pVrp, prVp, pVrVp, and prp (V = <i, e, a, o, u>).

3 Analyses

Responses were statistically analyzed using multinomial logistic regression models. The predictor variables *vowel type*, *vowel quality*, *vowel duration* and their interactions (three two-way interactions and one three-way interaction), as well as *subject* were entered into the model.

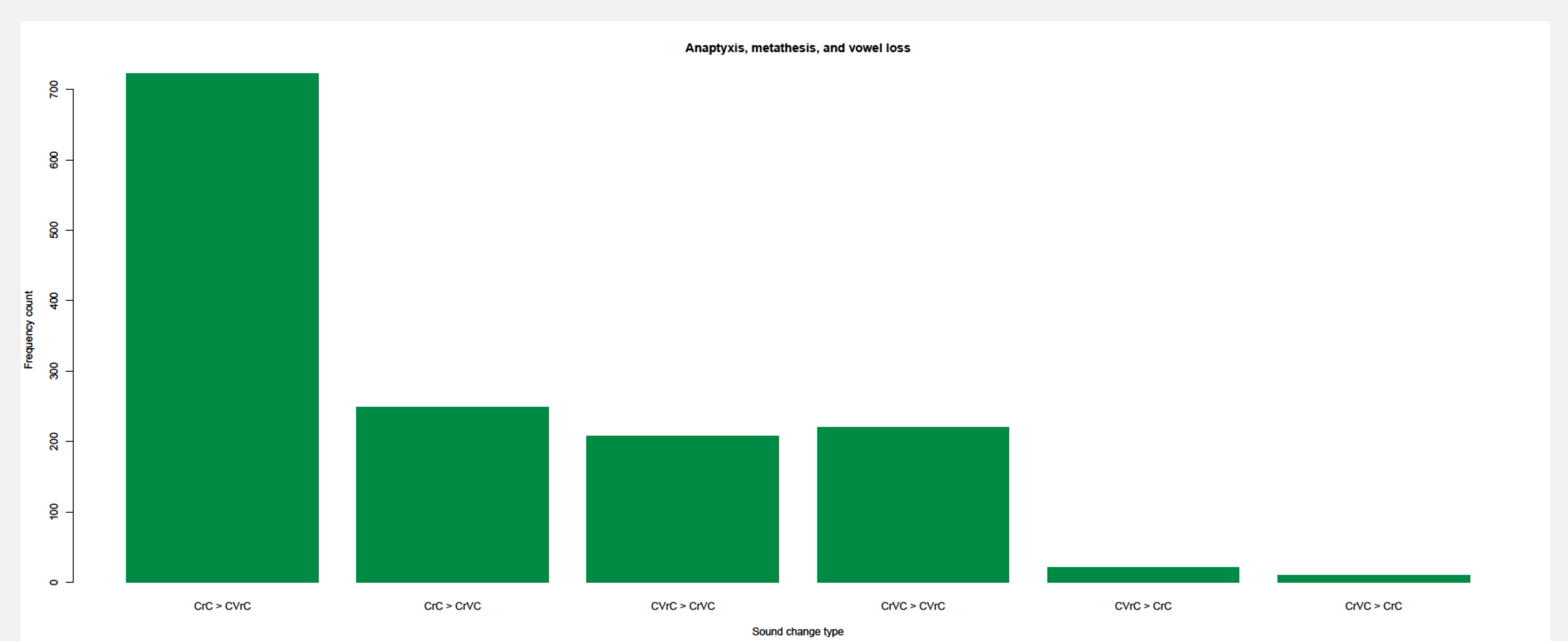
The model had an overall accuracy of 78.5%; all entered predictor variables proved highly significant in an ANOVA test ($p < 0.001$).

For further analyses, anaptyxis, vowel loss, and metathesis were formalized using the variables *vowel quality* and *vowel duration*.

References

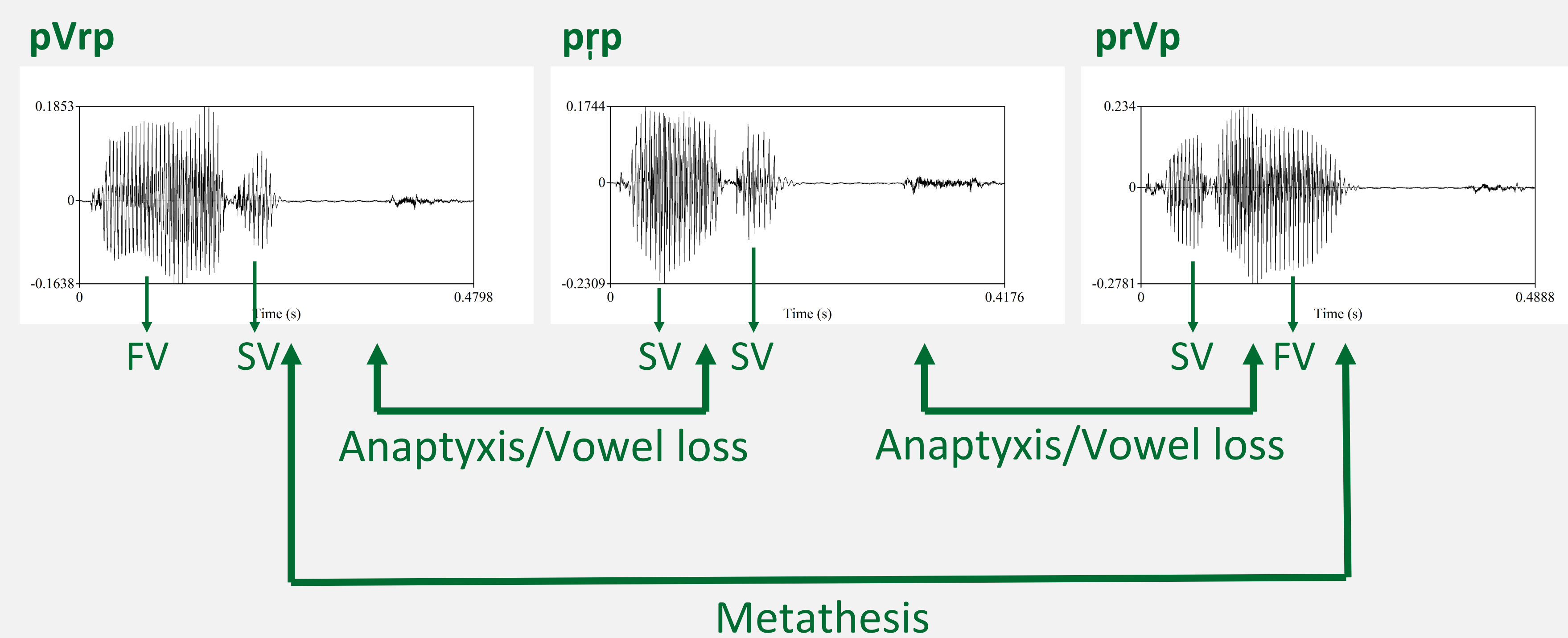
- [1] Ohala, J. (1993). Sound change as nature’s speech perception experiment. *Speech Communication* 13. 155-161.
 [2] Jetchev, G. (1995). Rhotics, jers and schwa in the history of Bulgarian. Paper presented at the 13th ICPHS, Stockholm, 13-19 August 1995.
 [3] Czaplicki, B. (2013). R-metathesis in English: An account based on perception and frequency of use. *Lingua* 137. 172-192.

4 Results



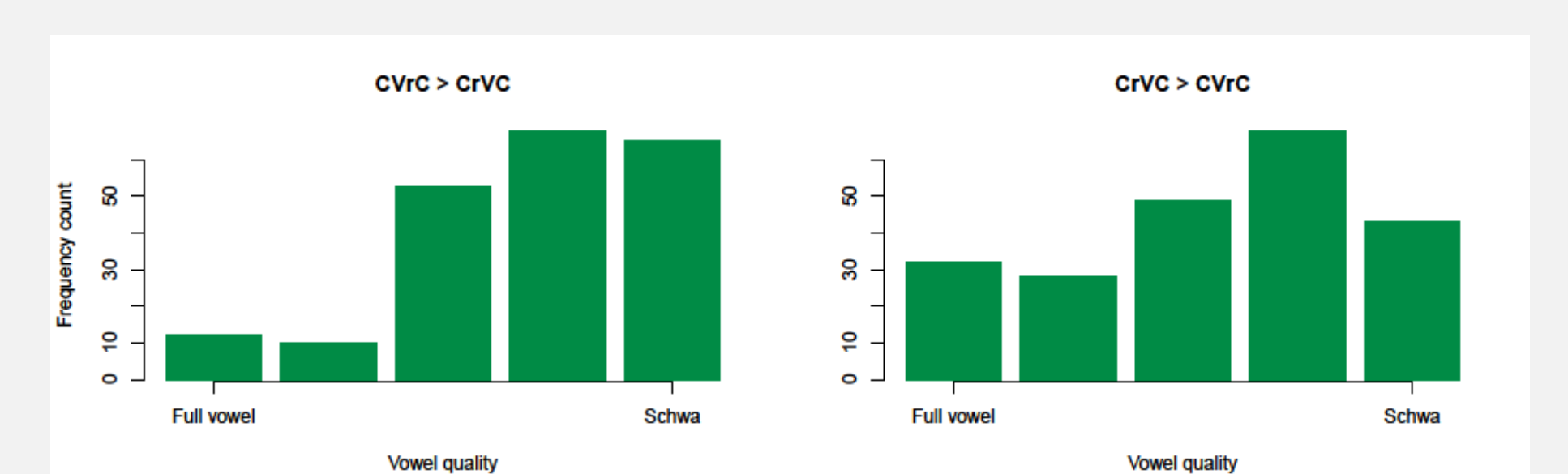
ACOUSTICS OF ALVEOLAR TAPS AND TRILLS

Waveforms of CVrC, CrVC, and CrC syllables with visible full vowels and svarabhakti vowels



Anaptyxis occurred almost three times more often in CrC > CVrC (10.6% pred.) than in CrC > CrVC (3.6% pred.). Metathesis occurred almost equally in CVrC > CrVC (2.4% pred.) and in CrVC > CVrC (2.5% pred.). Vowel loss did almost never occur (0.6% pred. for CVrC > CrC and 0.2% pred. for CrVC > CrC).

Metathesis predominantly occurred with centralized vowels; this effect was particularly strong for CVrC > CrVC.



5 Conclusion

- Anaptyxis in CrC syllables and metathesis in CVrC and CrVC syllables were shown to be perceptually driven.
- Metathesis did not show a preference for syllable positions (onset vs. coda) in the experiment, but occurred more frequently with centralized vowels than with full vowels.
- Vowel loss in CVrC and CrVC syllables could not be elicited in a significant frequency. This may be due to shortcomings of the experiment or point to vowel loss not being perceptually driven.

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