Compensation for coarticulation in prosodically weak words

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1. Introduction

- hyperarticulation in prosodically strong or accented words vs. hypoarticulation in prosodically weak or unaccented words (Lindblom, 1990)
- magnitude of coarticulation is greater in hypoarticulated, unaccented words than in hyperarticulated words (Fowler, 2005; Cho, 2004)
- listeners compensate perceptually for the effects of coarticulation (Mann & Repp, 1980)
- mismatch between how coarticulation in production and perception are parsed provide the conditions for sound change (Ohala, 1993), e.g. diachronic /u/-fronting in RP (Harrington et al., 2008)
- sound change occurs frequently in prosodically weak contexts (Beckman et al., 1992), e.g. Old English *muneceas* → present-day English *monks*

➔ **Research question: Do listeners undercompensate for a higher degree of coarticulation in prosodically weak words?**

2. Predictions

1. There is more C-on-V coarticulation in prosodically unaccented words.

2. Listeners compensate perceptually for the effects of C-on-V coarticulation.

3. Listeners compensate less for C-on-V coarticulation in prosodically weak words.

3. Method

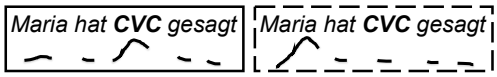
Participants: 15 speakers of Standard German participated in **two experiments**

Production

- target CVC non-words /pʊp, pʏp, tʊt, tʏt/ produced in two conditions
1. **Accented**: Question: *Was hat Maria gesagt?* Answer: *Maria hat **CVC** gesagt.*
2. **Unaccented**: Question: *Wer hat CVC gesagt?* Answer: ***Maria** hat CVC gesagt.*
- spectral slope and curvature by applying DCT over a frequency range of 260-2320 mel
- log. Euclidean distance ratio: measurement of relative distance of vowel trajectories to /ʊ, ʏ/ (per speaker and accentuation condition)

Perception

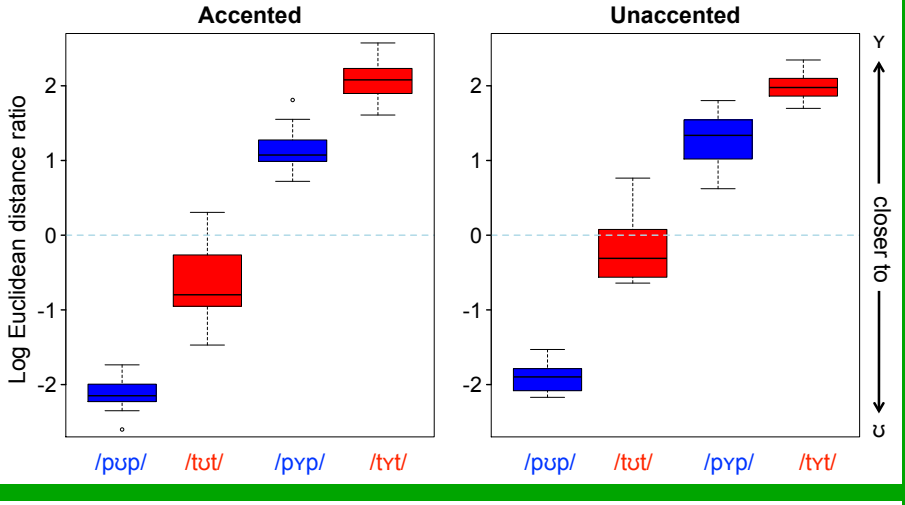
- /ʏ-ʊ/ continuum embedded labial /p_p/ and alveolar /t_t/ context
- CVC either accented or unaccented in



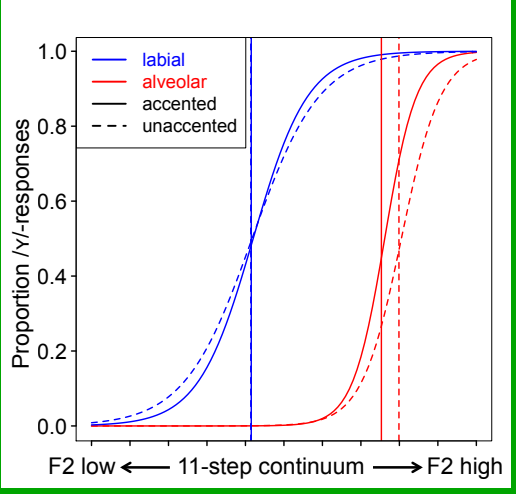
- 2AFC identific. test: TÜTT or TUTT, PÜPP or PUPP

4. Results

Production



Perception



Prediction 1: YES
- more /ʊ/-fronting in unaccented than in accented /tʊt/
- greater F2-target undershoot in prosodically weak /ʊ/ in alveolar context

Prediction 2: YES
- more /ʊ/-responses in alveolar context
- perceptual compensation for coarticulation

Prediction 3: NO
- listeners do not compensate to a lesser extent for coarticulatory effects in prosodically weak words
- the /tʊt-tʏt/ category boundary was right shifted in the unaccented condition, i.e., listeners are very sensitive to the expected greater increase of /ʊ/-fronting in the production of unaccented words and compensate for it

5. Discussion and Conclusion

- no differences in (compensation for) coarticulation in prosodically weak vs. strong /CʏC/ → perception and production match
- /ʊ/ in alveolar context is fronted to a greater extent in the production of unaccented vs. accented words and listeners are sensitive to this predicted shift in production, i.e. they perceptually compensate to a greater extent for coarticulation in prosodically weak words
- **No mismatch between the perception and production of coarticulation in prosodically weak words.**

6. References

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