Speaker Normalization of Stressed and Unstressed Vowels in Articulatory and Formant Spaces

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ABSTRACT
Anatomical Measure: Doming index calculated as ratio between the total midsagittal length of individual Consensus object: Reduction 8 dimensions to 2 by Principal Component Analysis. One of the goals of phonetic investigations is to find strategies for vowel production which is neither realized as an acoustic strategy. Phonetic variability is a result of variability in the way speakers control and direct the vocal-tract configuration to realize the same acoustic signal. Different speakers may use different articulatory strategies to achieve the same acoustic signal, due to individual biomechanical properties and individual vocal tract anatomies. In this paper, for the first time, we present a comparison of speaker-dependent strategies for the realization of stressed and unstressed vowels for five German speakers.

METHOD: PROCRUSTES ANALYSIS

Data Collection: Speaker Normalization

Figure 1: Overview of the procedure. The template jaw configuration is translated to align the mandible for all speakers and aligned to a positioning target. The articulatory positions of the last vowel of the test sentence are determined. The template articulatory target configuration is translated and aligned to the last vowel target configuration. The articulatory target configuration is then translated to align the mandible. The resulting articulatory configuration is then translated into phonetic context. The resulting context is the articulatory configuration for the vowel to be tested.

RESULTS

Figure 2: Comparison of the vowel realization in the two-dimensional space. The vowel realization is plotted for the first and second deformation eigenvalues. The first deformation eigenvalue is the variance of the first two deformation eigenvalues.

CONCLUSIONS

The results show that the variability of the articulatory configuration for the realization of stressed and unstressed vowels is due to different articulatory strategies. The variability is due to individual speech habits and individual biomechanical properties. The variability is also due to the variability of the vocal tract anatomies.

References


DISCUSSION CONCLUSIONS

1. Speaker Normalization

2. Articulatory Spaces

3. Relationship Anatomy and Speaker-dependent Models

4. SUMMARY

5. ACKNOWLEDGEMENTS

6. CONCLUSIONS