Russian palatalization, tongue-shape complexity measures, and shape-based segment classification

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The present study will address two research goals by analyzing ultrasound images of utterances from Russian speakers. The first goal is to provide a better characterization of the articulation of palatalized vs. non-palatalized consonants than is currently available. The second is to test and extend the shape analyses developed by Dawson, Tiede, and Whalen (accepted). One set of CVC stimuli contains palatalized and non-palatalized consonants in word-initial and word-final positions. Another set contains all of the vowels of Russian.

The most extensive ultrasound study of Russian palatalized consonants is Proctor (2011), which reports head-corrected ultrasound data (Whalen et al., 2005) for the palatalized and non-palatalized liquids /r/ and /l/, as well as /d/, in three vowel contexts (/e, a, u/). The present study differs from the Proctor (2011) study in two ways. First, Proctor (2011) was primarily concerned with characterizing liquids, whereas the present study will be primarily concerned with characterizing palatalization. Second, the present study will investigate palatalization in consonants with a greater number of primary oral articulators, manners, and word positions than Proctor (2011).

Dawson et al. (accepted) compared new and previously used methods for quantifying the complexity of midsagittal tongue shapes obtained with ultrasound. In that study, the first coefficient of a Fourier shape analysis similar to that of Liljencrants (1971) was used to successfully classify the consonants in *aCa* utterances and vowels in *bVb* utterances produced by English speakers based on the shape alone, that is, without any information about the position of the tongue in the vocal tract. The present study will test and extend the analyses from Dawson et al. (accepted) in two ways. First, we will compare the complexity and classification results from Russian vowels and non-palatalized consonants with the results for English. Second, we will investigate what the effects of both palatalization and word position (and the combination of the two) are on these complexity and classification measurements.

References

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