

## Variation in pronunciation of geminate consonants in Russian

Geminate consonants in Russian can be freely degeminated in speech. Several factors were proposed in the literature as responsible for the frequency of degemination in certain linguistic environments. Variation in pronunciation of geminate consonants in Russian was investigated in an experiment that combined perceptual labeling of variables and acoustic instrumental measurement of their duration. Resulting categorical and continuous data allowed to examine the effect a number of linguistic factors had on both frequency of occurrence of the variables (geminate vs. singletons) and duration of the target consonants. Results revealed significant effect of experimental task, morphology, stress location, position of the geminate within the word, and manner of articulation of the geminate. Among experimental tasks used in the experiment degemination was most frequent in text-reading task, followed by interview, and picture-task. Word-list reading contained the biggest number of preserved geminates.

Morphology contributes to frequency of degemination: geminates were preserved more often on the morpheme boundary than inside a morpheme.

Geminates adjacent to a stressed vowel - preceding or following it - are more protected from degemination than geminates between two unstressed vowels.

Geminates are most likely to be preserved in word-initial position than in word final position.

Long pronunciation is favored in intervocalic position as opposed to preconsonantal position.

Stops and fricatives were the most successfully preserved geminates, followed by nasals, [n] in particular. Liquids were the most frequently degeminated segments. [v] analyzed separately from other fricatives was preserved as a geminate even more often than stops and fricatives. The fact that [v] occurred only in word-initial position and only on morpheme boundary is probably responsible for this effect.

Analysis of categorical data and continuous data showed remarkably similar results: where categorical data showed higher frequency of degemination, continuous data pointed to shorter average duration of the consonant. Small number of difference between the results for categorical and continuous data suggest that phonemization of consonant length in Russian has detached from purely phonetic influences in some cases; even shorter consonant duration was leading to consonant identification as a geminate in certain environments.

Closer examination of distributional properties of consonant duration that the difference between two phonemic categories is more gradual than categorical, especially in spontaneous natural speech. In tasks that require more careful pronunciation, such as word-list reading, two categories were more distinctly separated.

The effect of examined linguistic factors also appears to be more gradual than categorical: they influence the degree of consonant lengthening/shortening rather than the frequency of occurrence of variables with predetermined duration values. The same effect on consonant length of investigated factors was observed within a category (geminate or singleton) as across categories, although smaller in magnitude. This result suggests that in Russian gradual allophonic effects become partially phonologized in the presence of semi-established phonemic contrast for consonant length. Consonant length, and therefore contrast between geminates and singletons, is better preserved in environments facilitating articulation of longer segments (e.g. in stressed syllables) or perception of consonant duration (e.g. intervocalic position).