

**Word prosodic structure and vowel reduction in Moscow and Perm Russian:
A study of phonetics and phonology**

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Central Standard Russian (CSR) is known for its typologically unusual word prosodic structure and vowel reduction pattern. The first pretonic syllable is unusually prominent, forming a salient contrast, together with the stressed syllable, with unstressed syllables in other, weak positions, which are heavily reduced, both in quality and quantity (Zlatoustova 1981, Kodzasov 1999). One could say that the first pretonic and stressed syllables form a nucleus (e.g. Kodzasov 1999) or that word stress is realised over two syllables (cf. Dubina 2012 on Belarusian). This means that effectively, there are two degrees of vowel reduction: a moderate degree for the first pretonic syllable and a radical degree of reduction for other unstressed syllables (e.g. Crosswhite 2000). In CSR, the word *molo'ko* is pronounced as [mələ'ko], with the second pretonic vowel being substantially shorter than the first pretonic vowel.

This two-degree reduction is strong in many traditional rural dialects in Central Russia, but much less pronounced, or possibly absent, in other parts of Russia (Vysotskij 1973 on rural dialects; Grammatčikova et al. 2013; Erofeeva 2005 on modern urban Russian).

Vowel neutralisation and durational vowel reduction appear to be separate phonological processes in East Slavic (e.g. Dubina 2012), and they occur in various forms and combinations. Neutralisation and durational reduction do not necessarily lead to reduction in quality, since in the strong first pretonic position, /a/ and /o/ can appear as open, high sonority vowels, even when they have reduced duration (in the position after non-palatalized consonants; cf. Barnes 2006; Knjazev 2006; Iosad 2012).

We compared vowel quality and duration in speech samples from 32 speakers from two different Russian cities, in order to provide empirical evidence for regional differences in the expression of the word nucleus, and to answer questions on the role of prosodic factors for their expression (accentuation, position in the utterance and pitch).

We recorded 32 adolescents, born in 1998 or 1999, in Moscow (central variety) and Perm (non-central variety with clear northern Russian traits; cf. Erofeeva 2005). They read 10 sentences containing words with a CV₂-CV₁-CV₀C structure with pretonic vowels /o/ and /a/ after non-palatalized consonants (which merge in most modern varieties of Russian), in several prosodic conditions.

Our data show that the distinction between the first and second pretonics is remarkably stable across prosodic conditions and across speakers in the Moscow data, but almost absent among the Perm speakers. The results clearly show that the durational distinction is categorical in Moscow speech, but its phonological status in Perm is unclear. The data also indicate that the merger of unstressed /a/ and /o/ might still be incomplete in Perm (cf. Erofeeva 2005).

Our vowel quality data point towards a correlation between duration and F1 for shorter vowels, similar to the data from some CSR speakers in Barnes (2006) and Padgett & Tabain (2005), suggesting that this reduction can be explained, at least partially, by phonetic undershoot (Barnes 2006). In first pretonic position, however, the F1 values can be as high or even higher than in the stressed vowel in Moscow, although these have longer duration.

We also had a look at the role of relative pitch. Dubina (2012) and Mołczanow (2015) link the prominence of the first pretonic syllable to a high tone on an abstract phonological level. The literature suggests that even in actual speech, the first pretonic is often produced with a salient

pitch peak before a fall on the stressed syllable in CSR (Kuznecova 1960), at least in focus position, and a pretonic peak was possibly close to obligatory in certain base dialects in Central Russia (cf. Bethin 2006). However, no empirical studies of unstressed syllables are known to us that take pitch levels into account. Mołczanow (2015) called for F0 measurements to check how much of the abstract high tone surfaces on the phonetic level, both in focus and non-focus positions. Our data show that in Moscow, first pretonic pitch peaks are indeed frequent, and much more frequent than in the Perm data, but in no way obligatory. The data also show that the durational difference between the second and first pretonic vowels in Moscow speech occurs independently of the relative pitch level of the vowels: as a rule, the first pretonic vowel is much longer than the second pretonic even when its pitch level is lower, both in focus position and in weak prosodic position.

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