

### Cuique suum: vowel reduction in Russian

This paper proposes an account of vowel reduction in Modern Standard Russian (MSR) which makes a clear distinction between phonetic and phonological aspects. More specifically, I argue there is no *phonological* contrast between two types of vowel reduction, and the phonology distinguishes only between stressed and unstressed syllables (cf. Barnes, 2007). Consequently, much of the observed sound pattern stems from duration differences due to a language-specific phonetic implementation component. The account stands in contradistinction to the one by Crosswhite (2001), where functional phonetic considerations are directly encoded in the phonological computation. The paper proposes an account of the vowel reduction in substance-free phonology (specifically, the Parallel Structures Model of feature geometry, Morén, 2003).

Modern Standard Russian is traditionally described as exhibiting two patterns of vowel reduction, sometimes called “moderate” and “radical”. In the former, exemplified in (1), the vowel space is somewhat cramped, but no vowel is reduced to schwa. This system appears in first pretonic syllables, in all onsetless syllables and, variably, in phrase-final open syllables.

- (1) (a) [kɔt] ‘cat’  
(b) [kɐ'ta] ‘cat (gen.sg.)’

In moderate reduction, exemplified in (2), most contrasts are neutralized, with all vowels except

/u/ realized as schwa-type segments. This system appears in all other unstressed syllables.

- (2) (a) [sat] ‘garden’  
(b) [sɐdɐ'vot] ‘gardener’

Crosswhite (2001) proposes to view the three-way contrast as phonological, with the moderate reduction position interpreted as being moraic but dependent within a foot and the radical reduction position as being unfooted and non-moraic. Thus, Crosswhite (2001) derives the patterns using constraints against certain features in certain positions, e.g. \*NONMORAIC/[*-high*].

The approach proposed in this paper relies on a distinction between (language-specific) phonetics and phonology. More specifically, phonology is only claimed to be responsible for the neutralization of certain contrasts: thus, in MSR /a/ and /o/ are always neutralized in unstressed positions, and the same is true of /e/ and /i/ (*contra* Padgett & Tabain 2005). The implementation of the outcome of this neutralization, on the other hand, is handled by the phonetics, which imposes constraints related to durational differences.

The clearest evidence comes from the hyperarticulation experiment by Barnes (2007), who shows that F1 is correlated with the duration of the syllable, and that even in “radical reduction” positions /a/ can be realized with an F1 of up to 1000 Hz (the normal F1 value for stressed /a/). This is supported by Kasatkina (2005), who notes pronunciations of clear [a] in the first pretonic syllable when that syllable bears a H tone. The importance of phonetic matters such as coarticulatory pressure and speech rate in the implementation of vowel reduction is also confirmed by Paufošima (1980) and Likhtman (1999).

Conversely, not all vowel reduction can be “written off” as a phonetic matter. First, some contrasts are not maintained even in unstressed syllables with sufficiently long duration. Second, some neutralization feeds into other phonological processes: e.g. the neutralization of /o/ and /i/ after interacts with the constraint against surface [ji]. I conclude that instead of integrating phonetic (or “phonetically grounded”) and phonological factors into a single constraint ranking (Padgett, 2004) it is preferable to distinguish between the two as separate systems.

I propose a phonological account in terms of substance-free phonology, as instantiated

in the Parallel Structures Model of feature geometry (Morén, 2003). In particular, I propose that Russian vowels have the feature specifications in (2)

(2) *Feature specifications for Russian vowels*

Vowel	V-place		V-manner	
	[labial]	[coronal]	[closed]	[open]
/u/	✓			
/i/		✓		
/e/		✓	✓	
/o/			✓	✓
/a/				✓

Within this system, the feature V-manner[closed] only appears in complex segments, and thus a constraint against it is essentially a constraint against complex structures. This constraint is operative in unstressed syllables (via positional faithfulness), and deletion of this feature straightforwardly gives the reduction pattern of MSR. After palatalized consonants (or, more specifically, consonants which bear the V-place[coronal] feature, not all of which are palatalized on the surface) no V-manner features are allowed, and V-place[coronal] spreads to the empty root node, giving the pattern where all vowels except /u/ are neutralized.

The proposed account thus gives a principled explanation for the facts of vowel reduction in MSR. First, it explains the distribution of the two reduction “grades” in a direct manner. Second, it is better compatible with the actual data than accounts relying on an idealized picture of it. Third, it explains the patterning of postalveolar obstruents and the affricate [ts] with palatalized consonants by recourse to a substance-free phonological feature, obviating the need for multiple levels of derivation within the phonology (*contra* Rubach, 2007). Thus, I conclude that Russian data provide support for a substance-free approach where phonetic factors are clearly separated from purely phonological ones which cannot be explained by recourse to phonetics.

## References

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