Palatalization in Russian: the true(r) story

This paper proposes a holistic approach to the set of (morpho)phonological phenomena in Russian usually subsumed under the label of "palatalization". Specifically, the following points are argued:

1. Palatalization (as secondary articulation) is contrastive for most consonants, including labials and velars. This contrasts with the frequent assumption that palatalization is derived from following front vowels (e. g. Plapp, 1999), or that palatalized velars [kʲ gʲ xʲ] are not contrastive segments;
2. There are only five vowel qualities in Modern Russian, i. e. /ɨ/ is not part of the inventory (for the opposing view see e. g. Rubach, 2000, but cf. Padgett, 2001);
3. Morpheme-edge phenomena involving "palatalization" (both as secondary articulation and primary place change) are due not to the phonological quality of the following vowel but to the presence of a floating autosegment (cf. Gussmann, 1992 for Polish);
4. With more economical and less substance-dependent representations, Russian palatalization is accounted for using quite standard Optimality Theory mechanisms, without the need for multiple levels of derivation (Rubach, 2000, 2007). We propose an analysis in terms of the Parallel Structures Model of feature geometry (Morén, 2003, 2006).

First, we consider the question of contrastive palatalization and the existence of /ɨ/. In particular, most of the arguments for the latter (Rubach, 2000) tend to hinge on morphological alternations. Thus, it is assumed that in (1), the plural suffix is /ɨ/, fronted to [i] after a palatalized consonant in (1-b) but failing to impose palatalization in (1-a). Conversely, in (1-c) the suffix starts with /i/, imposing surface palatalization.

(1)	a.	[nos] 'nose'	[nɐˈs-ɨ] 'noses'
	b.	[losʲ] 'moose'	[ˈlosʲ-ɪ] 'moose (pl.)'
	c.	[xvost] 'tail'	[ˈxvosʲtʲ-ɪk] 'small tail'

The account with six surface vowels and no contrastive palatalization also presupposes a counter-feeding order between a "palatalization" rule that turns /ki gi xi/ into [t͡ʃʲi ʒɨ ʃɨ] and another one which turns underlying /kɨ gɨ xɨ/ into [kʲi gʲi xʲi].

(2)	a.	[ruˈk-a] 'hand'	[rʊˈt͡ʃʲiʃːʲa] 'huge hand'
	b.	[ɪˈgrok] 'player'	[ɪgrɐˈkʲi], *[ɪgrɐˈt͡ʃʲi] 'players'

We argue that this proposal is unnecessarily complicated and in fact cannot account for all the data. Thus, in (3-a) the imperative suffix causes palatalization and thus must be /i/, but this is incompatible with the fact that it fails to turn velars into postalveolars/retroflexes (3-b).

(3)	a.	[plʲɪˈtʲ-i] 'weave!'	cf. [plʲɪˈt-u]'I weave'
	b.	[bʲɪrʲɪˈgʲ-i] 'protect!'	cf. [bʲɪrʲɪˈg-u] 'I protect'

We propose that in fact the palatalizations on morpheme edges are due not to the quality of the suffix' initial vowel, but rather to floating features/autosegments associated with the suffixes (Gussmann, 1992 makes a similar proposal for Polish). This immediately explains the facts of (3), but also the failure of /i/ to palatalize consonants across word and prefix-root boundaries ("retraction"). This also predicts that palatalization phenomena can be triggered by morphemes not starting with a surface front vowel (Hamilton, 1976). This prediction is borne out, cf. (4).

(4)	[pʲɪˈʃːʲ-an-ɨj] 'sandy'	[pʲɪˈsok] 'sand'

Once the independence of palatalization and surface vowel quality is established, we can

account for the various palatalization phenomena of Russian without recourse to multiple derivational levels and similar phenomena. We propose the following place representations for Russian consonants, couched within the Parallel Structures Model of feature geometry:

- Labials, coronals (except [t͡s]) and velars have the C-place features [lab], [cor], and [dor];
- Palatalization of these consonants is represented by V-place[coronal];
- Postalveolars/retroflexes have no C-place feature, but are specified as V-place[coronal] (this is also necessary to account for vowel reduction);
- The segment [t͡s] is placeless (cf. Morén, 2006 for Serbian).

The various palatalization phenomena are construed as the outcome of various docking strategies for floating V-place[coronal]. We propose that morphologically indexed constraints (e. g. DepLink) regulate whether, for each particular pair of suffix and place of the pre-suffix consonant, the floating feature is docked additively, displaces underlying place or fails to surface. The predicted possible outcomes are shown in (5).

(5)

Target	Docking	Displacement	No docking
C-pl[dor]	[k g x] → [kʲ gʲ xʲ]	[k g x] → [t͡ʃʲ ʒ ʃ]	[k g x]
C-pl[cor]	[t d s z] → [tʲ dʲ sʲ zʲ]	[t d s z] → [t͡ʃʲ ʒ ʃ ʒ]	[t d s z]
C-pl[lab]	[p b f v] → [pʲ bʲ fʲ vʲ]	([lʲ] epenthesis)	[p b f v]
Placeless		[t͡s] → [t͡ʃʲ]	[t͡s]

These predictions are borne out: all of the processes in (5) are indeed attested in Modern Russian (with the added complication of labials resisting deletion and forcing epenthesis of [lʲ], which can also be accounted for). Moreover, since the outcome is dependent on the ranking not of one constraint indexed for a particular suffix, but on the ranking of several such constraints referring to a particular place, it is predicted than one suffix may cause different alternations for different consonant places. This prediction is also borne out by the data (cf. Itkin, 2007). Thus, our account captures the full variety of attested phenomena.

Besides better empirical coverage, an advantage of the proposed account is that it disposes with derivational steps and opaque interactions in favour of a fully parallel OT model. An important difference vis-à-vis other proposals is that it uses substance-free representations, which makes a nontrivial phonetics–phonology interface possible. This enables capturing the truly phonological patterns without obscuring them by phenomena properly belonging to the phonetics or the interface. For instance, we show that some supposedly opaque interactions are in fact phonologically transparent. Thus, for example, Rubach (2000) notes that [ʃ] and [ʒ] behave in many respects like palatalized consonants, but are not palatalized on the surface (in particular, they are followed by [ɨ] and not [i]). He accounts for these facts using multiple levels. We propose, instead, that these segments are palatalized in the output of the phonology, while their surface velarization is a matter of the interface. This is because in all phonologically relevant respects they behave like palatalized consonants, while the distinction between [i] and [ɨ] is in fact a matter of phonetics rather than phonology (Padgett, 2001). It follows that the depalatalization (or maybe velarization) of [ʃ] and [ʒ] is a matter of the phonetics–phonology interface. Thus, the substance-free approach to Russian palatalization provides a principled explanation for the supposed opacity facts instead of largely stipulative level ordering.

References

Gussmann, Edmund. 1992. Back to front: non-linear palatalization and vowels in Polish. In Jacek Fisiak & Stanisław Puppel (eds.), *Phonological investigations*, 5–66. Amsterdam: John Benjamins.

Hamilton, Jr., William S. 1976. Vowel power versus consonant power in Russian morphophonemics. *Russian Linguistics* 3(1). 1–18.

Itkin, I. B. 2007. *Russkaja morfonologija.* Moscow: Gnozis.

Morén, Bruce. 2003. The Parallel Structures model of feature geometry. In *Working Papers of the Cornell Phonetics Laboratory*, vol. 15, 194–270. Ithaca, NY.

Morén, Bruce. 2006. Consonant–vowel interactions in Serbian: Features, representations and constraint interactions. *Lingua* 116. 1198–1244.

Padgett, Jaye. 2001. Contrast dispersion and Russian palatalization. In Elizabeth V. Hume & Keith Johnson (eds.), *The role of speech perception in phonology*, 187–218. San Diego: Academic Press.

Padgett, Jaye. 2003. Contrast and post-velar fronting in Russian. *Natural Language & Linguistic Theory* 21. 39–87.

Plapp, Rosemary Kuhn. 1999. *Lexical Phonology and Optimality Theory: analysis of Russian.* Ph.D. thesis, University of Iowa.

Rubach, Jerzy. 2000. Backness switch in Russian. *Phonology* 17. 39–64.

Rubach, Jerzy. 2007. Feature geometry from the perspective of Polish, Russian, and Ukrainian. *Linguistic Inquiry* 38(1). 85–138.