# Russian iotation: length is key[1]

## Background

Iotation is a morphophonological consonantal alternation, which has been studied extensively in Russian as well as in other Slavic languages (see, for instance, Rubach & Booij (2001) on Polish and Morén (2006) on Serbian iotation). In Russian, this alternation occurs base-finally upon attachment of certain morphemes (e.g. the passive participle suffix, the 1SG ending) and is completely productive in one of the several verb classes Russian has, that is, loanwords are subject to it too (Magomedova & Slioussar 2017).

The full list of iotation-induced alternations is provided in (1) below. One problem with iotation, which is the focus of this paper, is the appearance of the iotized labial/labio-dental consonants: unlike /d t z s g k x/, which surface as single segments, /b p v f/ grow a palatalized /l/ (see also (2–3) below for examples).[2]

(1) Alternation caused by iotation in Russian

a. g / k / x + j = ž / č / š

b. d / t + j = ž / č

c. z / s + j = ž / š

d. b / p / v / m + j = $bl^j$ / $pl^j$ / $vl^j$ / $ml^j$

e. n / r / l + j = $n^j$ / $r^j$ / $l^j$

(2)
| | |
|---|---|
| po**bud**ka – **bužu** | (d/ž alternation) |
| **kos**a – **košu** | (s/š alternation) |
| u**klon** – **klon**$^j$u | (n/$n^j$ alternation) |

(3)
| | |
|---|---|
| **l**$^j$**ub**ov$^j$ – **lyubl**$^j$u | (b/$bl^j$ alternation) |
| **sp**at$^j$ – **spl**$^j$u | (p/$pl^j$ alternation) |
| **stav**ka – **stavl**$^j$u | (v/$vl^j$ alternation) |

Iotation, as the term itself suggests, is often analysed, both synchronically and historically, as a merger of an iotizing segment (henceforth J) with the base-final consonant. The fact that labials appear to be different from other consonants in terms of iotation has mostly been attributed to the phonetic properties of the sounds involved, that is, the explanation rests on the fact that the labial must appear because the place of articulation of labials is too far from that of the J. Morén (2006:30) explicitly claims that the insertion of a palatalized /l/ is motivated by a prohibition against palatalized labials in Serbian. Russian iotation does not lend itself to this kind of explanation, since palatalized labials and labio-dentals are quite common in Russian. The analysis by Magomedova & Slioussar (2017) in the framework of OT incorporates a special substance-driven proviso for the labials as well.

## The problem

When the iotation of labials, the surface realization of J in particular, becomes the business of phonology, one is quite tempted to provide a phonetics-based analysis, because then the special status of the labials follows naturally. The behavior of labials under iotation is

[1] The source of the Russian data, if not specified, is the judgements of the authors themselves, who are native speakers of Russian.

[2] We will refer to labials and labio-dentals as labials when talking about Russian from now on (for the sake of simplicity).

captured by Magomedova & Slioussar (2017:4) in several steps: (a) palatalizing instead of iotizing violates MaxFlt and base-final palatalized labials are banned in the output of iotation; (b) *MAP(lab, pal) prohibits b/ž-like alternations; (c) epenthesis of /lʲ/ results (see the tableaux in (4) below).

(4) OT table for a *b*-final stem

| /lʲub/ + /Ju/ | MaxFlt | *MAP(lab,pal) | DEP | Ident(place) |
|---|---|---|---|---|
| lʲubʲu | *! | | | |
| ☞ lʲublʲu | | | * | |
| lʲužu | | *! | | * |
| lʲubžu | | *! | * | |

In Russian, iotation is not the only way to make a consonant more palatal: there is another process that bears the name *palatalization*, which produces a separate kind of consonantal alternation (5–6). Labials readily participate in palatalization, therefore the constraint against changing the place of articulation from labial towards palatal should not be sensitive to a slight change (palatalization) while being able to prohibit a more drastic change (for example, transforming /b/ into /ž/).

(5) po**bud**ka – **budʲ**it (d/dʲ alternation)
**kos**a – **kosʲ**it (s/sʲ alternation)
u**klon** – **klonʲ**it (n/nʲ alternation)

(6) **lʲub**ovʲ – **lyubʲ**it (b/bʲ alternation)
**spat**ʲ – **spʲ**it (p/pʲ alternation)
**stav**ka – **stavʲ**it (v/vʲ alternation)

MaxFlt and *MAP(lab, pal) appear to take care of this: an iotized labial cannot be palatalized because palatalization is not enough to represent J, so a labial-palatal alterantion cannot happen because the places of articulation are too far apart. However, the constraint on J surfacing as palatalization turns out to be too strong: /n r l/ become /nʲ rʲ lʲ/ after iotation and violate MaxFlt. We would expect an alternation to appear, considering that *MAP(lab, pal) does not apply, but there is none (7).

(7) Putative OT table for a *n*-final stem – the correct form is ruled out by MaxFlt

| /klon/ + /Ju/ | MaxFlt | *MAP(lab,pal) | DEP | Ident(place) |
|---|---|---|---|---|
| klonʲu | *! | | | |
| ☞ klonlʲu | | | * | |
| kložu | | *! | | * |
| klonžu | | *! | * | |

Magomedova & Slioussar (2017) seem to make a distinction between palatalization and iotation, since the output of the former is not enough to satisfy the faithfulness constraint on the realization of J, but this distinction is lost to an attempt to derive the correct surface forms of iotized consonants in phonology. There appears to be no way to model the surface realization of J on OT terms without constraint proliferation: the proposed MaxFlt has to be helped by other constraints both in the case of labials, which escape iotation but can palatalize, and in the case of /n r l/, which allow for a syncretic output for both processes.

**Analysis**

The many faces of J become less of an issue when one acknowledges that a consonant in Russian can appear in a non-palatalized, palatalized or iotized form, depending on the context. Arguably, this involves giving up on explaining the surface appearance of the three forms. Nevertheless, we propose that the phonetic nature of each form is irrelevant, as long as phonology is concerned (see Reiss (2017) on Substance Free Phonology). The *choice* of form is still done in the process of translation between phonology and phonetics and is therefore the business of the phonological module; our goal is to motivate this choice.

The idea of the three forms of consonants is not new: Brown (1998) suggests the three-way distinction in (8) below.

(8) Three forms of consonants, Brown (1998, Table 5)

| Zero Grade | Soft Grade | Jotated Grade |
|---|---|---|
| /p/ | /p'/ | /pl'/ |
| /b/ | /b'/ | /bl'/ |
| /m/ | /m'/ | /ml'/ |
| /f/ | /f'/ | /fl'/ |
| /v/ | /v'/ | /vl'/ |
| /t/ | /t'/ | /č/ |
| /d/ | /d'/ | /ž/ |
| /s/ | /s'/ | /š/ |
| /z/ | /z'/ | /ž/ |
| /l/ | /l'/ | /l'/ |
| /n/ | /n'/ | /n'/ |
| /r/ | /r'/ | /r'/ |
| /k/ | /č/ | /č/ |
| /g/ | /ž/ | /ž/ |
| /x/ | /š/ | /š/ |

(9) Word-formation via final palatalization

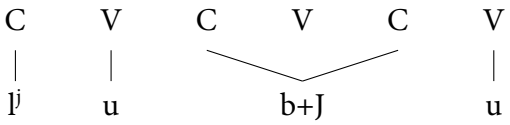
k / č:
**d$^{j}$ik**ost' – **d$^{j}$ič**
n / n$^{j}$:
**xr$^{j}$en** – **xr$^{j}$en$^{j}$**
b / b$^{j}$:
**glub**oko – **glub$^{j}$**

What follows is an analysis of iotation in the framework of Strict CV phonology (Scheer 2004). We take the Zero and Soft grade consonants to occupy one C-slot, as opposed to iotized consonants/clusters, which occupy two C's. It is plausible that iotation creates segments which take up two CVs because it occasionally creates clusters (e.g. when confounded with labials). Also, word-final consonants can be Zero or Soft grade (see, for example, (9) for a word formation process that involves a Zero-Soft word-final alternation) but never Iotated grade, which is consistent with the iotized consonants occupying two CV-slots. An epenthetic vowel is expected to appear in such contexts which would destroy the newly formed segment (10c). Since final empty nuclei are unable to govern, the ungoverned V-slot between the two Cs occupied by the Iotated grade consonant would be filled (see Ziková & Scheer (2010) on Slavic epenthetic vowels in Strict CV). Consonant-initial iotizing suffixes are not found either, for the same reason: an epenthetic vowel would prevent the consonant under iotation from associating to two C-slots.[3]

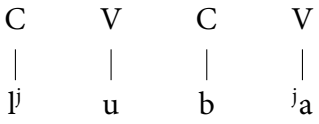
[3]There is a word in Russian that ends in *bl$^{j}$* and is diachronically related to a /b/-final verbal base: *rubl'* 'ruble' – *rubit'* 'chop'. The derivational link is lacking in Modern Russian, and the word is routinely pronounced with two syllables as *rubəl'*, which gives further support for the possibility of epenthesis in contexts where iotation is no longer recoverable.

We suggest that the Iotated grade consonants serve as realizations of palatalized consonants associated to two C-slots, as shown in (10a).[4] Palatalization proceeds via spreading of features from the suffix onto the base-final consonant (10b).

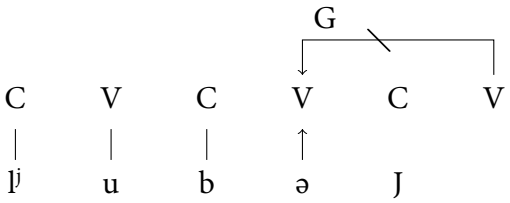
(10) a. lʲub + Ju → lʲublʲu 'I love'




b. lʲub + ʲa → lʲubʲa 'love-CONV'




c. Expected: lʲub + J → lʲublʲ




**Conclusions**

We have examined iotation in Russian and proposed an analysis of this phenomenon that aims to capture the distribution of the iotized consonants as opposed to the (non-)palatalized ones. The precise phonetic makeup of iotized consonants seems to us to be better explained diachronically, considering that the productivity of iotation is very limited and that a phonological explanation of why exactly J is turned into /lʲ/ after labials is bound to be relatively stipulative, as we have shown on the example of Magomedova & Slioussar (2017).

**References**

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[4]One might respond that the association of both J and the consonant under iotation to the same two CV-slots is dubious, since it implies crossing association lines. After **Coleman:1991** (**Coleman:1991**), we assume that crossing association lines are non-problematic for autosegmental phonology.