

# Russian prepositions and prefixes: unifying prosody and syntax

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## 1 Introduction

In this paper we explore the connection between syntax and prosody, with an empirical focus on Russian prepositions (PREP) and prefixes (PFX). These items are largely homophonous and show a parallel set of phonological behaviors in their interactions with their prosodic host. We will use the general term P to cover both categories, and P-COMPLEX for the structure containing P and its prosodic host.

- |                                  |  |
|----------------------------------|--|
| (1) Prepositions                 | (2) Prefixes   |
| a. iz(o) rta<br>‘from mouth.GEN’ | a. iz(o)ždalsʲa<br>‘got sick of waiting.MASC.PST’      |
| b. v(o) sne<br>‘in sleep.LOC’    | b. ot(o)spal<br>‘to sleep (a certain amount).MASC.PST’ |

Because these elements are largely homophonous, analysts argue about the degree to which they are phonologically and morphosyntactically identical (cf. Matushansky 2002; Zubritskaya 1995; Griбанова 2009). Here we elaborate on observations by Blumenfeld (2012), who demonstrated that there is variability in the application of particular phonological processes within the P-COMPLEX — yer realization and stress retraction. This variability is conditioned by numerous factors, and it is partially affected by syntactic configurations which, in turn, map to distinct prosodic structures. Our view is that the vocalization of the yer vowel (*o*) in (1) and (2) above arises systematically from the interaction of both syntactic and lexical factors.

Following Blumenfeld (2012), we will argue below that apparent prosodic similarity of PREP and PFX in fact masks a certain diversity. There are two types of P-COMPLEXes, which differ in the type of attachment of the proclitic to the host. In some cases, P is adjoined to the prosodic word ( $\omega$ ) of the host; in other cases, it forms a single  $\omega$  with it. These two prosodic options exist for both PREP and PFX. Our task in this paper is the characterization of one of the syntactic conditions that affects the choice between the two prosodic structures. In a nutshell, “reduced” syntax maps to “reduced” prosody in both PREPs and PFXs. Our account of this effect relies Hankamer and Mikkelsen’s (2005) *Extended Subset Principle*, which is a way of implementing Poser blocking (Poser, 1992) in Distributed Morphology (DM).

The paper is organized as follows. In §2.1 we argue that two phonological processes, yer realization and stress retraction, point to two prosodic types of P-COMPLEX in the case of PREPs. We illustrate that these two prosodic types are syntactically conditioned in §2.2. In §3 we provide an analysis of the syntax-prosody mapping. In §4 we extend our account to PFXs.

## 2 Phonology of the prepositional P-complex

We focus on two phonological processes affecting the P-COMPLEX: *yer* realization (YR) and stress retraction (SR). Both of these processes are domain-sensitive: the vowel-zero alternation at the core of YR is sensitive to the nature of the boundary within the P-COMPLEX; the nature of that boundary is also evident in the behavior of stress in SR. We demonstrate that similar syntactic restrictions are observed in YR and SR. The branchingness of P's complement is relevant to both phonological processes. YR and SR depend on the prosodic structure of the P-COMPLEX, which depends on the syntactic context in which P appears. We now take up these two processes in turn.

### 2.1 Yer realization and stress retraction

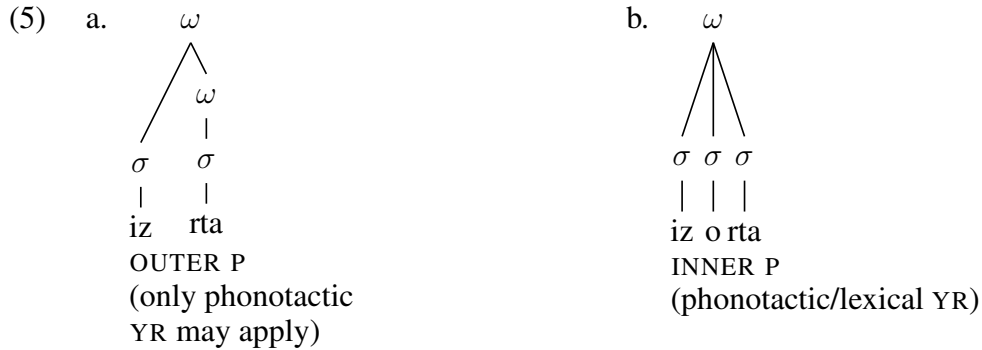
Historical short vowels [ǔ, ǐ] either delete or lower to [o, e] by Havlík's Law (Kiparsky, 1979), depositing synchronic alternations between [o, e] and ∅ in both the root and the P. Thus, consonant-final PREP and PFX have vowel-final allomorphs: *s(o)* 'with'; *k(o)* 'to'; *v(o)* 'in'; *ot(o)* 'from side of'; *iz(o)* 'from inside of'; *pod(o)* 'under', etc. The effect of Havlík's Law, the details of which need not concern us here, can be seen in (3). In the basic case, the vowel in the P appears whenever the vowel in the root does not surface.

(3)		OLD RUSSIAN	RUSSIAN	
a.	Roots	rǔt-ǔ	rot	'mouth.NOM/ACC'
		rǔt-a	rt-a	'mouth.GEN'
b.	PREPs	vǔ rǔt-ǔ	v rot	'in mouth.ACC'
		vǔ rǔt-ǔ	vo rtu	'in mouth.LOC'
c.	PFXs	podǔ-žǐg-l-ǔ	pod-žog	'kindled.MASC.PST'
		podǔ-žǐg-l-a	podo-žg-l-a	'kindled.FEM.PST'

In PREP, YR is subject to a variety of lexical and phonotactic factors (cf. Steriopolo 2007; Blumenfeld 2012; Linzen *et al.* To appear). An alternation in the root is not sufficient to trigger YR in P: some roots generally trigger it (4a), while others generally do not (4b); the difference is phonologically unpredictable. Conversely, (4c) shows examples where YR in P is not accompanied by any alternation in the root, triggered instead by cluster constraints. Steriopolo (2007) investigated the phonotactic conditions on YR, which include constraints against certain word-initial consonant sequences (\*#ssC; \*#vvC; \*#svC), and sonority sequencing effects.

(4)	a.	son	'sleep.NOM'	vo sne	'in sleep.LOC'
		den <sup>j</sup>	'day.NOM'	ko dn <sup>j</sup> u	'to day.DAT'
		ves <sup>j</sup>	'all.NOM'	so vsem	'with all.INSTR'
		rot	'mouth.NOM'	izo rta	'from mouth.GEN'
	b.	pen <sup>j</sup>	'tree.stump.NOM'	s pn <sup>j</sup> a	'from stump.GEN'
		p <sup>j</sup> os	'dog.NOM'	k psu	'to dog.DAT'
		l <sup>j</sup> on	'flax.NOM'	iz l <sup>j</sup> na	'from flax.GEN'
	c.	so skorost <sup>j</sup> ju	'with speed'	cf. skorost <sup>j</sup>	'speed.NOM'
		so svetom	'with light'	cf. svet	'light.NOM'
		so vremenem	'with time'	cf. vrem <sup>j</sup> a	'time.NOM'

Blumenfeld (2012) argued that the P-COMPLEX occurs in two kinds of prosodic structures, differing in the closeness of the P to the following material, which he calls ‘outer’ and ‘inner’ P. The difference between them is illustrated below: in (5a), the P is adjoined to the host, while in (5b) it is incorporated into the host’s  $\omega$ .



The structural difference between (5a) and (5b) can be harnessed to account for the behavior of YR and other processes. Phonotactic YR, as Blumenfeld (2012) argues, applies to all structures meeting its conditions, whether they have the shape (5a) or (5b). On the other hand, lexical YR (i.e. YR not triggered by constraints like \*#ssC) only applies to structures like (5b), where the P is not adjoined to the  $\omega$  of its host but forms a single  $\omega$  with it.

More precisely, following Ito & Mester (2003) and Ito & Mester (2006), we assume that prosodic domains allow certain types of adjunction. In particular,  $\omega$  may be contained in other instances of  $\omega$ , and phonological processes may subcategorize for maximal or minimal instances of a category, as defined below.

- (6) a.  $CAT_{max}$ : not dominated by any other CAT of the same type  
 b.  $CAT_{min}$ : not dominating any other CAT of the same type

Blumenfeld (2012)’s claim can be summarized as follows: lexical YR applies within  $\omega_{min}$ , while phonotactic YR applies within any  $\omega$ . One of the consequences is that phonotactic constraints override lexical ones: in environments where YR is phonotactically obligatory, there are no exceptions.

An argument that it is the prosodic structure that determines the behavior of YR is that YR is not the only process sensitive to the difference between the two prosodic structures. Stress retraction (SR) is sensitive to the same difference. By the Russian stress rule, the leftmost underlying stress is realized on the surface, modulo complications which need not concern us here. If all morphemes are lexically unaccented, the leftmost syllable bears stress (Kiparsky & Halle, 1977). Historically, PREPs are proclitics. Thus, when combined with unaccented nouns, they bear stress, giving the appearance of “retraction” of stress onto the PREP. Zaliznjak (1989) documents the gradual loss of this retraction in the synchronic grammar between the 12<sup>th</sup> and 16<sup>th</sup> centuries. The synchronic situation is highly lexical and variable (Ukiah 1998), as illustrated by the following examples.

- |                                    |                                       |
|------------------------------------|---------------------------------------|
| (7) WITHOUT SR                     | (8) WITH SR                           |
| a. za górod<br>‘for a city’        | a. zá gorod<br>‘to the countryside’   |
| b. za górodom<br>‘behind the city’ | b. zá gorodom<br>‘in the countryside’ |
| c. pod góru<br>‘under the hill’    | c. pód goru<br>‘downhill’             |
| d. do smérty<br>‘until death’      | d. dó smerty<br>‘extremely’           |

Blumenfeld (2012) argues that the same structural difference between prosodic adjunction (5a) and prosodic incorporation (5b) that underlies the behavior of YR is also responsible for the (non-)application of SR. Just like lexical YR, SR applies only within  $\omega_{min}$ . The central argument in favor of the same prosodic structure being responsible for both YR and SR is that the two phonological processes are subject to the same syntactic restrictions. Thus, the syntax affects the choice between (5a) and (5b), and the phonology follows straightforwardly. We take up this argument in the following section.

## 2.2 Syntactic effects on YR and SR

The default outcome for a P-COMPLEX is the adjunction structure (5a); for the incorporation structure (5b), special circumstances must hold. Several such conditions were mentioned by Blumenfeld (2012); here we expand on one syntactic effect stated in (9), and provide an account of it in the following section.<sup>1</sup>

- (9) P’s syntactic sister must be non-branching.

Consider the following data in support of (9). The examples in (10a) show obligatory YR in monoconsonantal prepositions before forms of the 1SG pronoun. In examples (10b)-(10e), the same sequences fail to undergo YR because the pronoun is not the P’s complement.

- (10) a. k\*(o) mne ‘to me’  
v\*(o) mne ‘in me’  
s\*(o) mnoj ‘with me’
- b. k(\*o) mne neizvestnomu človeku  
to I.DAT unknown.DAT person.DAT  
‘to a person unknown to me’
- c. v(\*o) mne neizvestom gorode  
in I.DAT unkown.LOC city.LOC  
‘in a city unknown to me’

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<sup>1</sup>This condition is necessary, but not sufficient to produce (5b); as mentioned above and in Blumenfeld (2012), there are lexical and other syntactic restrictions that are probably independent of (9).

- d. s(\*o) mnoj interesujuščims<sup>1</sup>a čelovekom  
with me.INST taking-interest.INST person.INST  
'with a person who takes interest in me'
- e. posle "Emblematiki", nesoveršennogo skolka k mne jasnoj  
after *Emblematiki* imperfect replica to I.DAT clear.DAT  
teorii  
theory. DAT  
'after *Emblematiki*, an imperfect replica of a theory that was clear to me' (A. Bely, "Why I became a Symbolist") (RNC)

The non-branchingness of the complement can be observed under the following circumstances. The PREP must occur before CVC nouns that have a *yer* (i.e. CVC-alternates with CC-), and the sequence must not be subject to overriding phonotactic YR. The lexical YR must be sufficiently frequent for the claim to be testable, which excludes a handful of nouns such as *p'os* 'dog', *šov* 'seam'). The following three items meet these conditions: *son* 'dream', *zlo* 'evil', and *dno* 'bottom'. Data was collected from the Russian National Corpus (RNC), limited to works created after 1900.

One way in which the complement of P may be branching involves adjectival modification (10); another way involves the noun inside the P-COMPLEX taking a complement. Since these complements are often genitive, we use nouns followed by genitives as a proxy measure for branchingness below.

	not followed by GEN	followed by GEN
<i>v sne</i> .SG	15	27
<i>vo sne</i> .SG	4583	334

$$\chi^2 = 195.5; p < 0.0001$$

**Figure 1:** *v(o) sne* 'in sleep/dream'

Of the 15 examples of *v sne* not followed by genitive, 10 are in fact not problematic: 4 involve quoted material (*v "Sne ob oseni"*, in "*The dream about autumn*"); in 3 cases, the preposition *v* is selected by lexical items like *nuždat'sja* 'need', in which case YR regularly does not apply (Blumenfeld, 2012). In the following 3 cases, the complement of *v* is actually branching:

- (11) a. kak v sne košmarnom  
as in dream nightmarish  
'as in a nightmarish dream'
- b. v sne do odurenija  
in sleep until nausea  
'in sleeping ad nauseam'
- c. v sne posle pira  
in sleep after feast  
'in sleeping after feast'

The following figures show that the same tendencies are observed with *dno* ‘bottom’ and *zlo* ‘anger/evil’. In each case, in the configurations where the complement is not followed by a genitive noun, the variant with YR is more frequent, and the difference is statistically significant.

	not followed by genitive	followed by genitive
k dnu	6	17
ko dnu	272	54

Fisher’s exact:  $p < 0.0001$

**Figure 2:** k(o) dnu ‘toward the bottom’

	not followed by genitive	followed by genitive
v zle	22	5
vo zle	109	4

Fisher’s exact:  $p < 0.014$

**Figure 3:** v(o) zle ‘in anger’ (branchingness determined by inspecting all examples)

A note on the variable nature of the data is in order here. Two complicating factors are that (a) the syntactic effect discussed here is not the only one determining the surface forms in question, and that (b) most of the effects are variable. This is responsible for the non-absolute numbers found in the tables above and below. Regarding (a), see Blumenfeld (2012) for a fuller discussion of other effects. Regarding (b), the variability is located both in the lexical YR — for example, there are lexical minimal pairs such as *vo množestve* ‘in many’ vs. *v množestve* ‘in a mathematical set’ — as well as in phonotactic YR where some constraints are close to inviolable, such as *\*#ssC*, while others reflect statistical tendencies, such as sonority sequencing (see Blumenfeld (2012) and Linzen *et al.* (To appear) for a fuller discussion). Given that our analysis involves two mappings — one from syntax to the prosodic structures in (5), and the other from those structures to the realization of forms with and without YR and SR — a natural question is whether the variability is located at either of those steps, or at both. We leave the full investigation of this question for another day, noting that the data are at least suggestive that once the structures in (5) are established, the phonological realization itself is not variable. This is demonstrated by the ungrammaticality of the sentences in (10): the branching syntactic structure is incompatible with YR. Once again, fuller argumentation for this position is left for future work.

Returning now to testing the relationship between the presence of YR and the branchingness of the preposition’s complement, an additional prediction of the claim is that there should be no lexical YR with adjectives. This is borne out nearly categorically by the RNC, as the following table illustrates. Here we compare the behavior of the noun *zlo* ‘evil’ with the adjective *zloj* ‘evil’, and find a near-categorical effect: there is no YR with the adjective.

The pattern with SR is similar. The triggering (pro)nominal must be the syntactic complement of the PREP. This complement should not be branching (no other complements, adjuncts). Again, these conditions are necessary but not sufficient

	N	Adj
(v k) zl-	145	203
(v k)o zl-	272	1

**Figure 4:** Lexical YR with PREPS followed by an adjective vs. a noun for SR to apply. Data from the accented subcorpus of the RNC reveals that there is a small but highly significant effect of branchingness (proxied by a following genitive) on the accented status of the prepositions *na* ‘on’, *iz* ‘from’, *po* ‘on’, and *do* ‘until’. Once again, the forms with SR are significantly more frequent when the complement noun is not followed by a genitive.

	not followed by genitive	followed by genitive
<i>ná</i> N	19704	3575
<i>na</i> N	67320	14602

$$\chi^2 = 77; p < 0.0001$$

**Figure 5:** *ná* N vs. *na* N ‘on N’

	not followed by genitive	followed by genitive
<i>íz</i> N	3144	876
<i>iz</i> N	14400	5657

$$\chi^2 = 69.3; p < 0.0001$$

**Figure 6:** *íz* N vs. *iz* N ‘out of/from N’

	not followed by genitive	followed by genitive
<i>pó</i> N	6225	1070
<i>po</i> N	18964	4678

$$\chi^2 = 96.2; p < 0.0001$$

**Figure 7:** *pó* N vs. *po* N ‘along N’

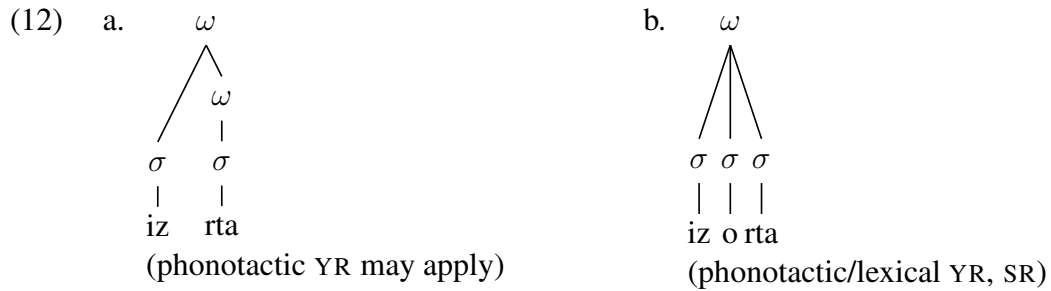
	not followed by genitive	followed by genitive
<i>dó</i> N	2629	402
<i>do</i> N	9044	1711

$$\chi^2 = 12.6; p < 0.0005$$

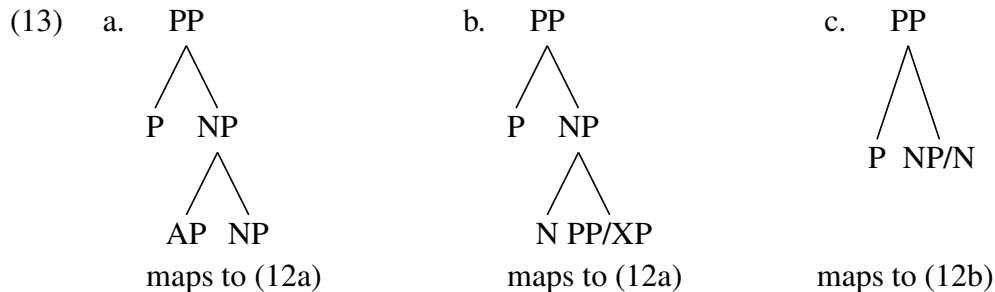
**Figure 8:** *dó* N vs. *do* N ‘until N’

### 2.3 Summary

Summarizing the phonological claim, there are two prosodic structures instantiated by the P-COMPLEX, repeated below: a structure with adjunction of the P to the host (12a), and a structure without adjunction (12b).



The two phonological processes of interest, lexical YR and SR, subcategorize to apply within  $\omega_{min}$ . Phonotactic YR may also apply within  $\omega_{max}$ . The choice between (12a) and (12b) depends at least in part on syntax. Full structures like (13) and (13b) map to the full prosodic structure with adjunction (12a). The reduced syntax in (13c) maps to reduced prosody (12b).



We take up the nature of this mapping in the following section.

### 3 Mapping from syntax to prosody

The primary observation we are interested in capturing is that the choice of prosodic structure for PREP P-COMPLEXES is partially conditioned by P's syntactic environment. In particular, P's complement must not be branching — i.e., it must not itself contain adjuncts or complements. Our strategy in accounting for this correspondence comes from Hankamer & Mikkelsen (2005), whose DM analysis of the form of the Danish definiteness marker keys in on this very distinction. In particular, we will leverage two crucial ideas: first, the Bare Phrase Structure notion that a projection (like the one in (13c)) can be simultaneously minimal and maximal (Chomsky, 1994), and second, the *Extended Subset Principle*, which allows syntactic environment to be taken into account in the process of translating between morphosyntactic terminals and their exponents.

#### 3.1 Hankamer and Mikkelsen 2005

Hankamer & Mikkelsen (2005) analyze the distribution of the two realizations of the Danish definiteness marker (14,15).<sup>2</sup>

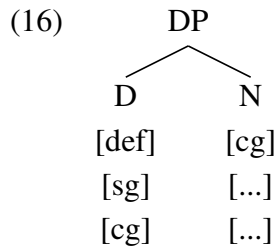
<sup>2</sup>There are complexities in the data which we do not address here for reasons of space and because they are not directly relevant to our analysis. For example, *-en* is lexically blocked in combination with a certain class of common gender complex Danish nouns (CG *-ende*).



- (14) a. hest-en  
horse-DEF  
'the horse'  
b. \*den hest  
the horse  
c. dén hest  
that horse  
'that horse'

- (15) a. \*gamle hest-en  
old horse-DEF  
b. \*den gamle hest-en  
the old horse-DEF  
c. den gamle hest  
the old horse  
'the old horse'

The distribution of Danish *den* vs. *-en* bears a resemblance to that of the two classes of Russian PREP. In both cases, these are exponents of the same morphosyntactic head (Danish D, Russian P). And in both cases, the choice of exponent depends on syntactic configuration; the suffixal form appears with bare nouns (16), while the full word form appears in more complex syntactic environments containing adjectival modifiers.



DM is a late insertion theory: phonological exponents are assigned to morphosyntactic feature sets based on the output of a syntactic derivation. In this process (Vocabulary Insertion) the most highly featurally specified Vocabulary Item whose identifying features are a subset of the features of the terminal node is inserted at that terminal node (Halle & Marantz, 1993). Since Danish *den* and *-en* realize the same feature bundle [D, def, sg, cg], the Vocabulary list contains two entries.

- (17) a. *-en* ↔ [D, def, sg, cg] if sister to a minimal *N* that contains the features [sg] and [cg].<sup>3</sup>  
b. *den* ↔ [D, def, sg, cg] elsewhere.

(17a) references a particular syntactic context — that of a *minimal N*. Hankamer & Mikkelsen (2005) intend this to be a reference to a “reduced” structure: a nominal projection that contains no maximal projections. In bare phrase structure terms, this translates to a structure which is simultaneously minimal, containing only the lexical item that projects the label, and maximal, because it serves as the complement to another head (Hankamer & Mikkelsen, 2005, 104, fn. 25).

Both *-en* and *den* realize the same set of features, but one is better suited to a particular syntactic context. To capture this, we need an extended version of the *Subset Principle*:

<sup>3</sup>... and whose exponent is not a CG *-ende* noun: *besøgende, døende, forbipasserende, forretningsdrivende, henseende, logerende, medvirkende, n+stkommanderende, parrende, rejsende, studerende, udenforstående, vagthavende...*

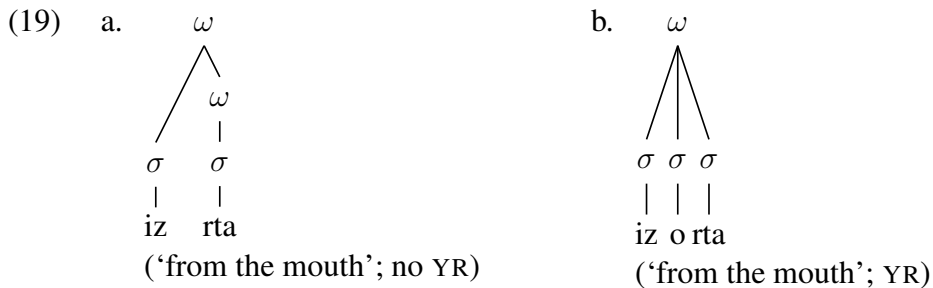
(18) *Extended Subset Principle*

The phonological exponent of a Vocabulary item is inserted into a morpheme in the terminal string if the item matches all or a subset of the features specified in the terminal morpheme. Insertion does not take place if the Vocabulary item contains features not present in the morpheme. Where several Vocabulary items meet the conditions for insertion, the item matching the greatest number of features specified in the terminal morpheme must be chosen. If two or more Vocabulary items contain the same features but differ in contextual specification so that the contextual specification of one item is a subset of the contextual specification of another, the item with the more restricted contextual specification must be chosen.

This extension has the effect that *-en* will be inserted in the more restricted context, i.e. the context of a *minimal N*. DPs with adjectival modifiers (15) do not fit the syntactic environment for *-en* insertion, so the elsewhere form (*den*) obtains.

### 3.2 Mapping for prepositional P-complexes

The proposal described just above can be extended seamlessly to the Russian cases of interest in this paper. Although the two classes of Russian PREPs are homophonous, in most other senses they behave just like the two forms of the Danish definite article: Russian PREPs come in two classes, one prosodically more incorporated (19b,20b) than the other (19a,20a). Just as with Danish, the choice of form is determined by appearance in a specific syntactic context.<sup>4</sup>



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<sup>4</sup>A difference between the two cases is that the mapping in Danish is categorically conditioned by morphosyntactic factors, whereas in Russian, as Blumenfeld (2012) has demonstrated, other factors contribute to a more mixed result.

- (20) a.  $\omega$   
 $\swarrow \searrow$   
 $\omega$   
 $\swarrow \searrow$   
 $\sigma \quad \sigma\sigma$   
 $| \quad / \quad |$   
na zimu  
('for winter', no SR)
- b.  $\omega$   
 $\swarrow \quad \downarrow \quad \searrow$   
 $\sigma \quad \sigma \quad \sigma$   
 $| \quad | \quad |$   
ná zimu  
('for winter', SR)

The two sets of PREPs realize the same morphosyntactic features,<sup>5</sup> and will therefore be in competition for insertion. Although the phonemic representation of the relevant PREPs is identical, their prosodic behavior is not; we capture this via the DM Vocabulary Insertion rule in (21), in which one of the exponents will be more prosodically dependent than the other (represented by the dash).

- (21) a.  $iz(o)- \leftrightarrow [P]$  if sister to a minimal *N*.  
b.  $iz(o) \leftrightarrow [P]$  elsewhere.
- (22) a.  $na- \leftrightarrow [P]$  if sister to a minimal *N*.  
b.  $na \leftrightarrow [P]$  elsewhere.

By the *Extended Subset Principle*, the condition in (21a,22a) is more specific, which will have the consequence that the smaller prosodic structure (19b,20b) will result from syntactic structures in which a *minimal N* is found. This, in turn, may result in the application of YR or SR inside the P-COMPLEX in reduced syntactic configurations.

#### 4 Prefixes

The account extends naturally to the phonological behavior of verbal prefixes (PFX), which come in the same two prosodic flavors as PREP. This prosodic difference between “inner” and “outer” PFX correlates with the distinction between lexical (LP) and superlexical (SLP) prefixes.

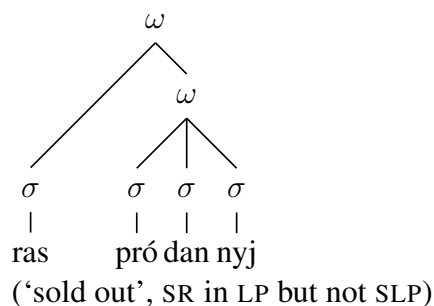
The two morphosyntactic classes of prefixes, LP and SLP, are both perfectivizing. There are morphosyntactic distinctions between two classes (aspect, argument structure), but they are often homophonous.<sup>6</sup> When combined with a particular stem, LPs result in idiosyncratic, spatial or resultative meanings, do not stack in prefix stacking, and can change the root’s argument structure. In contrast, SLPs contribute predictable, adverbial or quantificational meanings, do not change the argument structure of the verb, and participate in prefix stacking, attaching in such cases outside LPs.

The phonological claim is that SR and lexical YR apply only with LP.

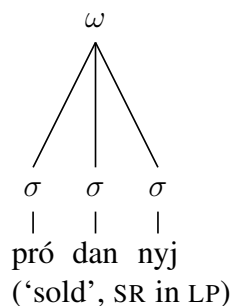
<sup>5</sup>Some of the complexes in which SR has applied involve slightly more idiomatic interpretations (8) than their non-SR counterparts (7). We take this to be the consequence of the interplay between specific syntactic environments and semantic interpretation, i.e. not lexically encoded in the PREP.

<sup>6</sup>See Svenonius 2004a,b, Isačenko 1960, Babko-Malaya 2003, Tatevosov 2008, *inter alia*, for extensive discussion of the properties of the two groups.

(23) Outer P: SLP



(24) Inner P: LP



#### 4.1 Phonological evidence

The effect of the morphosyntax of PFX on SR can be readily observed in the following past passive participle forms (cf. Ostrogorskaja-Jakšič 1987). Because only SLPs stack, if there is more than one PFX, only the most inner one will be a LP. The behavior of SR in (25) vs. (26) shows that the  $\omega_{min}$  domain extends only to LP; SLP are prosodically adjoined to  $\omega$ .

- (25) a. p<sup>o</sup>-zvannyj ‘called’ LP-stem  
 b. ná-n<sup>’</sup>atyj ‘hired’  
 c. pr<sup>o</sup>-dannyj ‘sold’  
 d. pére-dannyj ‘transferred’  
 e. d<sup>o</sup>-pityj ‘drunk up’
- (26) a. pod-ná-n<sup>’</sup>atyj ‘hired in addition to’ SLP-LP-stem  
 b. ras-pr<sup>o</sup>-dannyj ‘sold out’  
 c. za-pr<sup>o</sup>-dannyj ‘sold in advance’  
 d. pere-pr<sup>o</sup>-dannyj ‘sold a second time’  
 e. ne-d<sup>o</sup>-pityj ‘not drunk up’

As for YR, the phonological distinction between LPs and SLPs is more difficult to observe, but the data are suggestive in the right direction. One clear characteristic of YR with LPs is that it is generally not variable (unlike the more intricately patterned YR with ‘inner’ prepositions). Most LP-stem combinations are fixed.

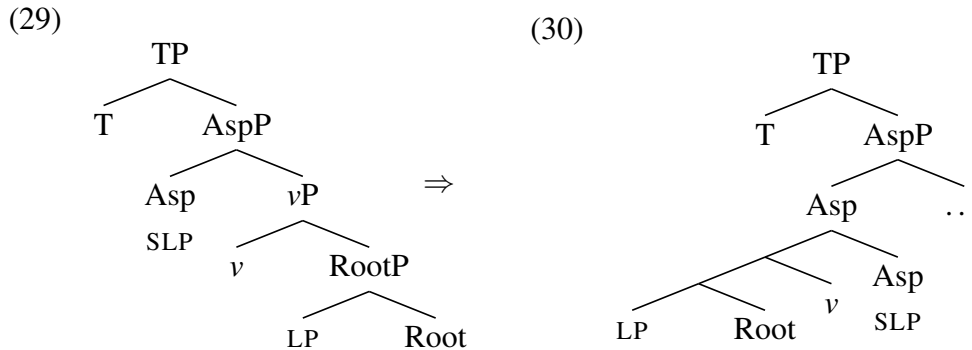
Russian has a smaller inventory of SLPs compared to other Slavic languages. Of the available SLPs, only *ot-* and *iz-* are consonant-final, making them eligible for YR in the first place. Based on the evidence we have available to us (from the Google corpus), YR in the SLP P-COMPLEX is variable, suggesting that we are dealing here with ‘outer’ prefixes.

- (27) a. Ja svoi tri s polovinoj žizni uže **ot-spali**.  
 I self’s three with half lives already SLP-sleep.PST.M  
 ‘I have already slept my three and a half lives.’  
 b. Deti uže pol dnevnogo sna **ot-spali**.  
 children already half day sleep SLP-sleep.PST.PL  
 ‘The children slept half of their daily measure of sleep.’

- c. Ja uže ves<sup>i</sup> **iz-ždalsja**.  
 I already all SLP-wait.PST.REFL.M  
 ‘I am sick and tired of waiting.’
- (28) a. Na prirode v palatke uže svoe **oto-spal**.  
 on nature in tent already self’s SLP-sleep.PST.M  
 ‘I’ve slept my share in the tent out in nature.’
- b. Ja v armii uže svoe **oto-spal**.  
 I in army already self’s SLP-sleep.PST.M  
 ‘I’ve already slept my share in the army.’
- c. Tebja ja **izo-ždalsja** v pux i prax!  
 you I SLP-wait.PST.REFL.M completely  
 ‘I am completely sick and tired of waiting for you!’

#### 4.2 Mapping from syntax to prosodic structure

It turns out that the same syntactic conditions that govern the distribution of the two classes of PREPs also govern the distribution of the two classes of PFXes. Our proposal is based on head-moved structures developed for the Russian verbal complex by Gribanova (2010, 2013).<sup>7</sup>



When linearized, (30) will have the order in (31):

- (31) [SLP [[LP root] v]]

The Vocabulary Items in (32) are directly parallel to those we find in the section on PREPs (§3), except that the categories of the P and its complement are different.

- (32) a. *ot(o)–* ↔ [P] if sister to a minimal X.<sup>8</sup>  
 b. *ot(o)* ↔ [P] elsewhere.

A natural consequence of this analysis is that LP, which map to the prosodically reduced structure, will only ever have one complement (the root), which is non-branching. This contrasts with SLP, which take branching complements and which

<sup>7</sup>See Babko-Malaya 2003, Fowler 1994, Svenonius 2004a for similar proposals, with variations that do not concern us here.

<sup>8</sup>Here, too, we assume that LP and SLP are composed of the same morphosyntactic features, with any differences in their behavior to be derived from differences in syntactic configuration.

we therefore expect to map to the recursive prosodic structure. What this predicts for the phonology, again taking into account the *Extended Subset Principle*, is that SR and YR will apply in P-COMPLEXES with LPS; for SLP, SR will not apply, and YR will apply variably. On the whole, this demonstrates that the syntactic configuration that maps to a reduced prosodic structure is meaningful for syntax-prosody mapping both in the nominal *and* in the verbal domain.

## 5 Conclusion

Pulling together the observations from the domain of both PFX and PREP, the striking observation is that both groups exhibit different phonological behaviors, which can be traced back to distinct prosodic structures and, in turn, to distinct syntactic configurations. Two pieces of the analysis emerge as particularly striking: first, Hankamer and Mikkelsen's (2005) approach (in particular, their notion *sister of a minimal X*) has emerged as directly applicable to the Russian data described here. Second, the same mapping mechanism appears to be required both for PFX in the verbal domain and PREP in the nominal domain. Both observations suggest a much broader range of applicability for these tools.

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