

Yer Vocalization in suffixed forms; the case of Russian

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0. Introduction

All Slavic languages have at least one vowel that alternates with zero. These vowels are called yers (or jers). In the generative tradition Slavic yers have received a lot of attention. The commonly held view is that a yer is vocalized (realized as a vowel) if the next vowel is also a yer. In all other environments a yer is deleted. This account of the distribution of vocalized yers has always been embedded in a *derivational* (rule based) conception of phonology.

Recently, however, an alternative analysis of Slavic yers, more in particular of Russian yers, has been proposed in Yearley (1995). In this view an underlying yer is vocalized only if vocalization leads to the elimination of a tautosyllabic consonant cluster. Yearley's analysis is embedded in an entirely different conception of phonology, one that is *non-derivational*. More in particular she adopts the framework of *Optimality Theory* (OT).

It turns out, though, that in a morphologically complex form containing two yers in a row the position of the vocalized yer is opaque. This type of opacity is rather problematic for Yearley's approach. It is particularly interesting to note that a solution in terms of cyclicity is not possible. Even if OT would recognize the cycle it would not be compatible with Yearley's idea that yer vocalization is triggered by syllable optimization.

In this article I will propose a solution to this problem. I will show that Yearley's analysis of yer vocalization can only explain the opaque position of a vocalized yer if it is combined with OT's subtheory of *Output-Output-Correspondence*.

This article has the following structure. In the first section I present Yearley's *OT-based* analysis of the distribution of vocalized yers, and I compare it with the traditional *rule based* account. In the second section I show that in a sequence of two adjacent yers the position of the vocalized yer is opaque. I also show that Yearley's analysis cannot account for this type of opacity in terms of cyclicity. In the third section I show that Yearley's analysis can be maintained if it is combined with *OO-Correspondence*.

1. Vocalization and deletion of yers

In this section I briefly sketch two analyses of the Russian yers. The first is the traditional one. It rests on the rather straightforward rules of *Yer Vocalization* and *Yer Deletion*. The second analysis is developed in Yearley (1995). In this analysis yers vocalize in order to avoid a consonant cluster in coda position. Yearley's proposal is developed in the framework of OT, a theory of phonology that is non-derivational in nature.

1.1. The rule based account

The facts in (1) show that Russian has two vowels that alternate with zero. The forms in the column on the left in (1) are examples of an alternating *e*; the forms on the right demonstrate that *o* can also alternate with zero. The first vowel is a front yer, whereas the second vowel is a back yer.^{1, 2}

(1) <i>vowel-zero alternations</i>			
<i>front yer</i>		<i>back yer</i>	
ves'	'all, nom. sg. masc.'	rot	'mouth, nom. sg.'
vs'+a	'all, nom. sg. fem.'	rt+a	'mouth, gen. sg.'
beden	'poor, short form'	polon	'full, short form'
bedn+yj	'poor, long form.'	poln+yj	'full, long form'

A priori one can think of two possible analyses to explain this alternation. The first analysis is based on the idea that a vowel is *deleted* in some environment. On closer view, however, it becomes clear that a deletion analysis does not work. To see this consider the following forms:

(2) <i>stable vowels in the same environments</i>			
ves	'weight, nom. sg.'	rabot	'work, gen. plur.'
ves+a	'weight, gen. sg.'	rabot+a	'work, nom. sg.'
len'	'laziness, nom. sg.'	voron	'crow, gen. plur.'
len+i	'laziness, gen.sg.'	voron+y	'crow, gen. sg.'

Comparing the forms in (1) with those in (2) we can see quite clearly that a general rule of deletion is not possible, simply because there is a *contrast* between the presence and the absence of vowels in exactly the same phonological environment.

The second analysis one can think of is based on the idea that a vowel is *inserted* in some phonological environment; let us say a tautosyllabic consonant cluster. There are two fundamental objections to this approach. First of all it is difficult to see how it would account for the *qualitative* contrast between the two alternating vowels.³ Secondly, and more importantly, this approach suffers from a

¹ With a few exceptions the examples in this article are from Yearley's interesting article. The exceptions are from Osegov's dictionary.

² I have followed Russian spelling as closely as possible. Palatalization of consonants (represented by a raised comma) is therefore only indicated if Russian spelling does so. The boundaries between morphemes are represented as '+'.
³ It is certainly true that in certain environments the qualitative contrast is neutralized. It is equally clear, however, that the vowel's quality is not fully predictable. This is the standard view on the yer's

similar problem as the analysis based on deletion; it cannot account for the fact that there is a contrast in the same phonological environment. This time we are interested in tautosyllabic consonant clusters. Taking this as the phonological environment we find that in some forms a cluster is resolved by epenthesis, whereas in other forms the same cluster does not undergo epenthesis. This contrast is illustrated with the following examples.

(3) *stable vowels and yers in the same environment*

lasok	‘weasel, gen. plur.’	lask	‘caress, gen. plur.’
lask+a	‘weasel, nom. sg.’	lask+a	‘caress, nom. sg.’
kost’or	‘bonfire, gen. plur.’	kostr	‘boon, gen. plur.’
kostr+a	‘bonfire, nom. sg.’	kostr+a	‘boon, nom. sg.’

These forms indicate that the vowel-zero alternation cannot be explained in terms of a general rule of epenthesis inserting a vowel in a tautosyllabic consonant cluster.

Even though all this might be true, generative phonology has never ceased to argue in favor of a *general* rule accounting for the vowel-zero alternation. The first steps have been taken in Lightner (1972), a seminal work on Slavic yers which has been followed by many researchers. Particularly interesting contributions in the same spirit as Lightner are Rubach (1986) and Rubach (1993). Basing himself mainly on data from Polish and Slovak Rubach argues that yers differ from stable vowels in the following way: stable vowels are linked to a mora in their underlying representation, whereas yer vowels are unlinked to a mora. ⁴Applied to Russian this leads to the contrast given in (4).

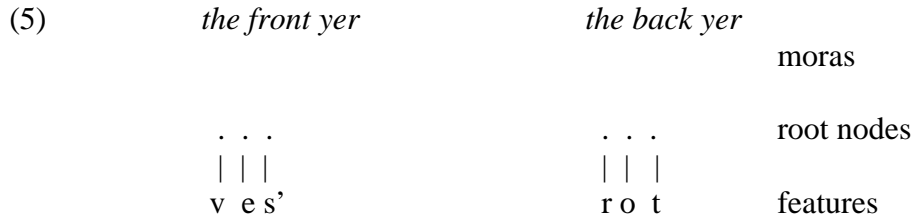
(4) *the contrast between stable vowels and yers*

<i>a morpheme containing a stable vowel</i>	<i>a morpheme containing a yer</i>	
μ		moras
.	root nodes
v e s	v e s’	features

The morpheme *ves* ‘weight’ has a stable vowel. This corresponds with the fact that the root node of this vowel is linked to a mora. The vowel of the morpheme *ves’* ‘all’, on the other hand, does alternate with zero, which corresponds with the absence of a mora in the underlying representation. Since Russian, just like Slovak, has two contrastive yers (although this contrast is often neutralized) this language has the following two yers at the underlying level:

In this article I am only concerned with the factors determining the vocalization of yers. I have nothing to say about the qualitative neutralization.

⁴ Actually, Rubach works in a framework based on X-slots, rather than moras. For our purposes,

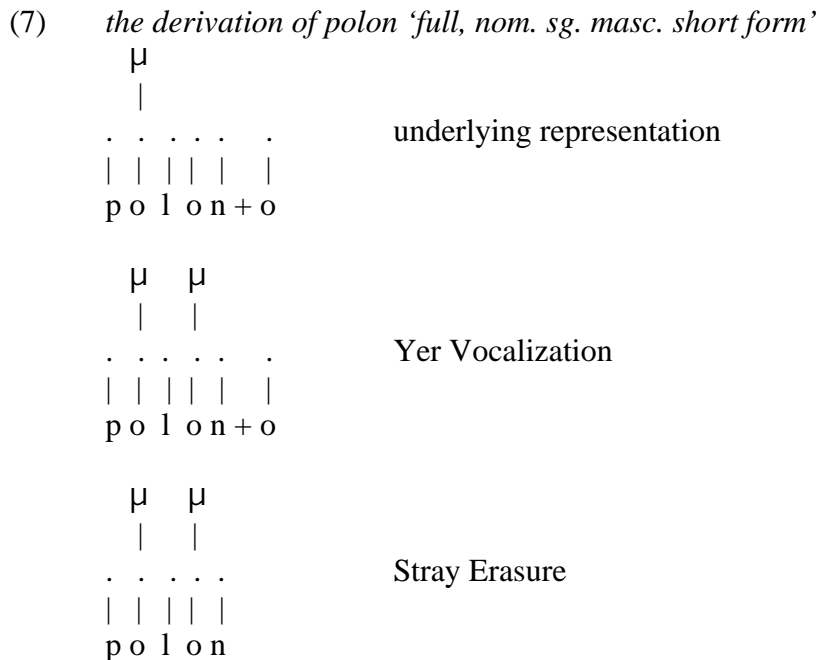


Following Lightner's proposal Rubach assumes that a yer is vocalized if the next vowel on the right is also a yer. An informal version of this rule is given in (6).

- (6) *Yer Vocalization*
 Associate a floating (moraless) vowel to a mora,
 if it is followed by another floating vowel

All yers that have not undergone *Yer Vocalization* (and are therefore not changed into a real vowel) are deleted at a later stage of the derivation by *Stray Erasure*. This is a general principle removing all material that is not linked to the prosodic hierarchy.

Inflectional endings that start with a yer are: the nom. sg. masc. of nouns and adjectives (of the short form), and also the gen. plur. of fem. nouns. The form *polon* 'full' is derived in the following way:



Since there are two consecutive yers, the environment of *Yer Vocalization* is met. Consequently, the first yer is vocalized. At the end of the derivation *Stray Erasure* applies yielding the surface form *polon*. Compare this with *poln+yj*, the long form of this adjective. Here there is just one yer. Hence *Yer Vocalization* does not apply. At the end of the derivation *Stray Erasure* applies yielding the surface form *pol+nyj*.

(8) *the derivation of poln+yj 'full, nom. sg. masc. long form'*

μ	—	
·	·	·
p	o	l
n	+	y
j		

underlying representation

---- Yer Vocalization

μ	μ	
·	·	·
p	o	l
n	+	y
j		

Stray Erasure

We can summarize the traditional rule based account of Slavic vowel-zero alternations in the following way: *Yer Vocalization* transforms a sequence of two consecutive yers into a sequence of a real vowel followed by a yer. *Stray Erasure* removes all yers that have not undergone *Yer Vocalization*. The analysis sketched in this section represents the predominant view on Slavic yers. Until quite recently it even was the only view, at least in the generative tradition. Let us now turn to the second analysis of the Slavic vowel-zero alternation, proposed in Yearley (1995).

1.2. The constraint based account

Yearley's analysis of yers is cast in the framework of Optimality Theory (OT).⁵ The seminal works in this theory are Prince and Smolensky (1993), McCarthy and Prince (1993) and McCarthy and Prince (1995). OT differs from the classical model of generative phonology in a number of aspects. According to the classical model a grammar consists of a set of ordered rules. A rule applies if and only if its structural description is met in the input. In the classical model, then, the most significant level is a rule's input, since that is the level where it is decided whether a rule applies. OT, on the other hand, claims that a grammar consists of a set of universal constraints which are ranked in a language specific way. The set of hierarchically ordered constraints evaluates a possibly infinite set of outputs, filtering out all outputs except one. This unique output is the optimal candidate, the one that is phonetically realized. Constraints are hierarchically ordered because they can conflict with each other. In case of a conflict the dominating constraint is decisive. Constraints are therefore violable, although violation is minimal and always enforced by another constraint higher in the hierarchy. Due to the fact that constraints are ranked with respect to each other it becomes possible to obtain very parochial effects from very simple constraints. A particularly nice illustration of this characteristic feature of OT is Yearley's analysis of Russian yers.

Yearley adopts Rubach's hypothesis that a yer is a moralesse vowel. Moralesse

⁵ Actually, Yearley works in the 'Parse-and-Fill' model, which is the first version of OT, developed in Prince and Smolensky 1993. In this article I adopt the Correspondence model of OT, developed in McCarthy and Prince 1995. Due to this difference I have modified some of the constraints proposed by Yearley in order to make them compatible with the correspondence model. These differences are only

vowels violate a constraint PARSE-V.⁶ Its formulation is as follows:

- (9) PARSE-V
A vowel should be linked to a mora

This constraint is surface true in Russian. It must therefore occupy a very high position in the hierarchy. For our purposes we can assume that it is undominated.

Due to PARSE-V, an underlying representation containing a morales vowel can never be optimal. There are two ways to eliminate a violation of PARSE-V. A mora can be inserted, or the vowel can be deleted. Both changes violate faithfulness, a family of constraints penalizing any difference between input and output. Insertion of a mora violates DEPENDENCY-_μ (DEP-_μ). Deletion of the underlying vowel violates MAXIMIZATION-V (MAX-V). These two faithfulness constraints are formulated in the following way:

- (10) DEP-_μ
A mora in the output should correspond to a mora in the input
(i.e. do not insert a mora)
- (11) MAX-V
A vowel in the input should correspond to a vowel in the output
(i.e. do not delete an underlying vowel)

First consider a form like *lask+a* ‘weasel’. Recall from (3) that *lask*, the root of this form, must have a back yer, since an *o* is vocalized in the gen. plur. Considering first the nom. sg. *lask+a*, we note that the yer is removed. This indicates that it is better to delete the vowel than to insert a mora; in other words, in case of a conflict it is the constraint DEP-_μ which is satisfied, not MAX-V. To express this relation between the two constraints we say that DEP-_μ dominates MAX-V, or DEP-_μ » MAX-V. Now consider the following tableau:

(12) DEP-_μ » MAX-V

lasOka	PARSE-V	DEP- _μ	MAX-V
lasoka		*!	
lasOka	*!		
* laska			*

In this tableau it is shown how the three constraints evaluate three output candidates generated on the basis of the underlying form *lasOk+a* ‘weasel, nom. sg.’ (cf. (3))⁷. The underlying form is located in the upper box on the left. The surface candidates are given underneath the underlying form. In the upper row the underlying form is followed by the three constraints in the order reflecting their position in the hierarchy. PARSE-V is probably undominated in the language, and for that reason it dominates DEP-_μ. In its turn DEP-_μ dominates MAX-V, as suggested above. Evaluation proceeds from left to right, column by column. In the first column, headed by PARSE-V, the second candidate violates PARSE-V. For this reason it receives an asterisk. Since in

⁶ This constraint is a member of a family of constraints requiring that all material be properly attached to the prosodic hierarchy. A segment must be linked to a syllable (possibly through the intervention of a mora), a syllable must be dominated by a foot, etc.

this column the second candidate is the only candidate violating PARSE-V, this violation is fatal. This is indicated by the exclamation mark. Fatal violation implies that the candidate is thrown out of the competition; further violation marks in the columns yet to come are no longer relevant, as is indicated by the shaded cells.

At the level of the second column two candidates are still left, then. In the first candidate a mora is inserted, hence it violates DEP-_. This is fatal, because the other candidate does not violate this constraint. Hence, the first candidate is thrown out of the competition. Now the third candidate is the only one which still is in the competition. It is therefore the optimal candidate, as is indicated by the pointing finger. Although it is optimal it does violate MAX-V. This constraint, however, is lower in the hierarchy than DEP-_. Hence, a candidate violating MAX-V is favored over a candidate violating DEP-_.

In sum, the tableau above clearly demonstrates how the two constraints DEP-_ and MAX-V are in conflict, and how the conflict is resolved. Since DEP-_ dominates MAX-V, deletion of a moraless vowel (yer) is preferred over insertion of a mora (vocalization of a yer). The hierarchy of the three constraints proposed so far therefore implies that yers are deleted.

Of course, this is only partly correct, as we have seen; under certain circumstances yers do surface. What, then, are the conditions under which yers are realized (vocalized)? To this question Yearley has the following ingenious answer. It is well known that languages tend to avoid consonant clusters in coda position. The constraint penalizing a coda cluster is NOCOMPLEXCODA (NOCOMCOD).

(13) NOCOMCOD

A complex coda should be avoided

Yearley's proposal is to rank NOCOMCOD above DEP-_. The result is that in coda position a mora is inserted, even at the cost of a violation of DEP-_. I show this in the following tableau.

(14) NOCOMCOD » DEP-_

lasOk	PARSE-V	NOCOMCOD	DEP-_
* lasok			*
lask		*!	
lasOk	*!		

In this tableau *lasok* is considered, the gen. plur. of *lask+a* 'weasel' (cf. (3)). Suppose that the yer of the root would not surface. If that were to happen NOCOMCOD would be violated. This constraint is in direct conflict with DEP-_. Either a mora is inserted, so that DEP-_ is violated and NOCOMCOD is satisfied, or no mora is inserted, so that NOCOMCOD is violated and DEP-_ is satisfied. The conflict is resolved in favor of NOCOMCOD, because in the grammar of Russian this constraint dominates DEP-_. Of course, there is yet another possibility to avoid a violation of DEP-_, and possibly also of NOCOMCOD; we can leave the underlying yer unparsed (unlinked to an element in the prosodic hierarchy). The third candidate in the tableau in (14) realizes this possibility. Leaving the yer without a mora, while at the same time preserving it in the output constitutes a violation of PARSE-V. Since this constraint is very high in the hierarchy, presumably even undominated, the third candidate cannot be optimal. To simplify the discussion somewhat I will henceforth leave PARSE-V out of consideration, together with all the candidates violating it.

In sum, according to the hierarchy proposed so far a yer is not vocalized, unless its vocalization eliminates a coda cluster. This explains the contrast between forms like *lask+a* (nom. sg.) and *lasok* (gen. plur.). In *lask+a* elimination of the yer does not lead to a coda cluster, because the second consonant of the cluster can be syllabified in the *onset* of the syllable created by the vowel of the ending. In *lasok*, on the other hand, elimination of the yer does lead to a coda cluster. In *lask+a*, therefore, the yer is eliminated, due to the fact that DEP- dominates MAX-V, whereas in *lasok* the yer is realized, due to the fact that NOCOMCOD dominates DEP- . This has been shown in the tableaux in (12) and (14).

The next question we have to answer is why only yers are able to break up a consonant cluster. Why is it not possible to insert a regular vowel? Obviously, Russian does not allow free insertion of a vowel to break up a consonant cluster in coda position, as we have seen in (3). I have shown there that the language tolerates consonant clusters in coda position, and that *only yers* can be used to break up a consonant cluster in coda position.

There is an important difference between vocalization of a yer and epenthesis of a vowel. In the former case only a mora is inserted, whereas in the latter case a mora *and* a vowel are inserted. Consequently, two constraints are violated, DEP- and DEP-V. The latter constraint is formulated in (15).

(15) DEP-V

A vowel in the output should correspond to a vowel in the input
(i.e. do not insert a vowel)

Free insertion of a vowel to avoid a consonant cluster in coda position can now be blocked if DEP-V is ranked above NOCOMCOD. This is shown in the tableau in (16), where the underlying form is *lask* ‘caress, gen. plur.’, a form without a yer in the root.

(16)

	lask	DEP-V	NOCOMCOD
	lasok	*!	
✱	lask		*

In the first candidate a vowel is inserted. Although this candidate satisfies NOCOMCOD it violates DEP-V. Since the latter constraint dominates the former in the grammar of Russian, violation of DEP-V is fatal. In the second candidate the consonant cluster in coda position is not split up. Although this candidate therefore violates NOCOMCOD it is the optimal candidate, because the alternative, insertion of a vowel, is even worse.

Notice that DEP-V is not violated if the underlying form contains a yer, because in that case no vowel is inserted. The high ranking of DEP-V therefore explains why yer vocalization is able to break up a consonant cluster, whereas vowel epenthesis cannot perform this task. In the former case DEP-V is not violated; only DEP- is violated and this constraint is dominated by NOCOMCOD. In the latter case, on the other hand, DEP-V is violated, and this constraint is even higher in the hierarchy than NOCOMCOD.

In Yearley’s account, then, basically four constraints explain the distribution of vocalized yers, provided they are ranked in the following way:

- (17) *The grammar of Yer Vocalization*
DEP-V » NOCOMCOD » DEP-₁ » MAX-V

The domination of DEP-₁ over MAX-V ensures that deletion of a yer is preferred over its realization. Domination of NOCOMCOD over DEP-₁ implies that deletion of a yer is blocked if it would lead to a consonant cluster in coda position. Domination of DEP-V over NOCOMCOD, finally, ensures that only yers have the ability to break up a consonant cluster.

1.3. A comparison

Yearley notes that there are two important differences between the two accounts sketched above. The rule based account claims that a yer is vocalized only if another yer follows (cf. the rule of *Yer Vocalization* in (6)). As a consequence of the specific formulation of *Yer Vocalization*, the rule based account is sometimes forced to postulate an underlying yer in positions where it never surfaces. Among the data we have considered so far this happens in the nom. sg. masc. of nouns and short form adjectives and also in the gen. plur. of fem. nouns. The constraint based account, on the other hand, claims that a yer is vocalized in order to avoid a consonant cluster. The presence or absence of a following yer has nothing to do with it. Consequently, in this account it is no longer necessary to postulate yers that never surface. In sum, in at least two instances underlying representations can be simplified in the constraint based account. Although this is a nice result, the second advantage of the constraint based account is much more important.

In the rule based account *Yer Vocalization* plays a central role. It is quite clear that this rule lacks explanatory adequacy. In fact it is completely ad hoc in the sense that it just restates the attested facts in a particular format, nothing more. In particular it does not provide us with any insight as to *why* in a sequence of two yers the first is vocalized. The environment mentioned in the rule is entirely arbitrary. One could for instance just as well imagine a rule vocalizing a yer only if it is followed by a high vowel, rather than another yer. Such a rule would be equally complex and equally arbitrary. This shows that the attested rule of *Yer Vocalization* lacks explanatory adequacy.

The constraint based account, on the other hand, does provide us with a very simple explanation as to *why* a yer is vocalized; a yer is vocalized in order to avoid a cluster in coda position. The vocalization of yers can therefore be seen as an instance of a widespread phenomenon, the epenthesis of a vowel to avoid a consonant cluster in a coda position. Furthermore, the constraint based account is able to offer this explanation without formulating a constraint that specifically mentions yers. It only uses highly general, even universal, constraints and ranks them in a language specific order. It is therefore clear that the constraint based account is superior.

Although this might be obvious if we look at the simple cases, it is much less clear if we take into account more complex cases. In the next section we will have a look at these cases.

2. The problem of opacity

In this section I demonstrate that in morphologically complex forms containing two adjacent yers the pattern of yer vocalization is opaque. Basically, there are two types of opacity, positional opacity and overapplication of yer vocalization. I also show in this section that in Yearley's account cyclicity cannot solve this problem.

2.1. Opacity

So far we have seen cases where the constraint based analysis, in sharp contrast with the rule based approach, is not forced to postulate two yers in a row. Let us now take the next step and have a look at cases where the underlying form unambiguously contains two yers in a row, also according to the constraint based approach. We begin with forms where the sequence of consecutive yers is followed by a stable vowel.

A representative underlying form containing two yers in a row followed by a stable vowel is *ba_En'+Ok+a* 'tower, dim. nom. sg.', which is realized as *ba_en+k+a*. The root of this form must contain a (front) yer, as is evident from the fact that it contains an *e* which alternates with zero.

(18) *ba_n'+a* 'tower, nom. sg.' *ba_en* gen. plur.

The diminutive suffix following the root in the example *ba_En'+Ok+a* also contains a yer. This becomes clear if we look at a form like *golov+Ok+a* 'head, dim. nom. sg.'. This form exhibits a vowel-zero alternation in the domain of the diminutive, as is shown in (19).

(19) *golov+k+a* 'head, dim. nom. sg.' *golov+ok* gen. plur.

On the basis of the examples in (18) and (19) we can conclude, then, that the surface form *ba_en+k+a* derives from the underlying representation *ba_En'+Ok+a*, which contains the configuration we are interested in: two consecutive yers followed by a stable vowel.

Notice now that in this configuration it is the *first* yer which is vocalized. In the rule based approach this is no problem, of course, since that is exactly what *Yer Vocalization* brings about. In the constraint based approach, on the other hand, things are not so easy. According to this analysis a yer is deleted, unless its realization can prevent the appearance of a consonant cluster in coda position. Now consider the following tableau, where the dots represent syllable boundaries:

(20)

<i>ba_EnOka</i>	DEP- V	NOCOM COD	DEP- ₋	MAX-V
.ba_n.ka.		*!		
☞ .ba_.no.ka.			*	*
✱ .ba_.en.ka.			*	*
.ba_.e.no.ka.			**!	

In this tableau a set of candidates is evaluated generated on the basis of the underlying form *ba_En'+Ok+a* which contains two yers in a row followed by a stable

vowel. In the first candidate no yer is vocalized. This creates a violation of NOCOMCOD, so this candidate cannot be optimal. In order to eliminate the complex coda one of the yers must be realized. But is entirely unclear why only the first yer can be realized. According to the analysis of yer vocalization based on syllable optimization there should be free variation, because the second and the third candidate are equal with respect to the distribution of violation marks. This prediction is incorrect, of course, as is indicated by the reversed pointing finger assigned to the second candidate. In Russian every word has always a unique vocalization pattern.

In sum, in forms containing a sequence of two consecutive yers before a stable vowel the account based on syllable optimization cannot explain the precise position of the vocalized yer. One can say that in these cases the *position* of the vocalized yers is *opaque*.

In forms containing a sequence of two consecutive yers in final position the syllable based account also makes wrong predictions. Consider the following examples:

- (21) *a* *basic nouns containing a yer*
- | | | | |
|-------|-------------------|--------|-------------------|
| veter | ‘wind, nom. sg.’ | vetr+a | ‘wind, gen. sg.’ |
| bugor | ‘knoll, nom. sg.’ | bugr+a | ‘knoll, gen.sg.’ |
| pen’ | ‘stump, nom. sg.’ | pn’+a | ‘stump, gen. sg.’ |
- b* *diminutivation*
- | | | | |
|----------|----------|-----------|----------|
| veter+ok | nom. sg. | veter+k+a | gen. sg. |
| bugor+ok | | bugor+k+a | |
| pen’+ok | | pen’+k+a | |

(21a) shows that the three nouns *veter*, *bugor* and *pen’* must have an underlying yer, because they exhibit the vowel-zero alternation. In (21b) these nouns are combined with the diminutive suffix *-k*. We have already seen that this suffix contains a yer. This is further supported by the examples in (21b), because they also show that this suffix exhibits the vowel-zero alternation. The forms on the left in (21b) thus contain the sequence now under investigation: two consecutive yers in final position. A concrete example like *veter+ok*, for instance, has the underlying representation *vetEr+Ok*. The following tableau demonstrates that the account of yer vocalization based on syllable optimization cannot explain the surface form of *vetEr+Ok*.

(22)

vetErOk	DEP- V	NOCOM COD	DEP- <u> </u>	MAX-V
☞ .ve.trok.				*
☛☛ve.te.rok.			*!	
.ve.terk.		*!	*	*

In the first candidate a complex onset is formed. This being the case, vocalization of the first yer becomes superfluous. For this reason the second candidate should be suboptimal, which is incorrect.

One might think that vocalization of the first yer is necessary to avoid a complex *onset*. While vowel epenthesis has this function in many languages, it surely does not in Russian. In this language it is clearly more costly to vocalize a yer than to form a complex onset. This is unambiguously shown by cases like *vetEr* a ‘wind

gen. sg.’, where the yer is followed by a stable vowel. In the actual pronunciation of this form, *vetr+a*, the two intervocalic consonants are in the onset of the second syllable. Realization of the yer would eliminate the complex onset, yielding **veter+a*. The fact that *vetr+a* is preferred over **veter+a* shows that DEP-_, the constraint against yer vocalization, is ranked above NOCOMON, the constraint penalizing complex onsets. The argument is summarized in the following tableau:⁸

(23)

vetEra	DEP- ₋	NOCOM ON	MAX-V
.ve.te.ra.	*!		
* .ve.tra.		*	*

We can conclude, then, that forms containing two consecutive yers in final position are very problematic for the analysis based on syllable optimization. It predicts *n* vocalized yers, where it should be *n+1*. In this environment, then, we find a different type of opacity: yer vocalization *overapplies*. The first instance of opacity, *positional opacity*, is irrelevant in this environment, because the second yer in the sequence must be realized in order to eliminate a complex coda, as is shown by the third candidate in the tableau in (22).

In the next section I will argue that the opacity problem cannot be explained in terms of cyclicity.

2.2. Cyclicity: an impossibility in the constraint based approach

In principle it is possible to incorporate cyclicity into OT. Recently a model of this type has been argued for in Kiparsky (1999). In this model each cycle constitutes a level where the constraints select an optimal candidate, which is subsequently fed into the next cycle as part of the underlying form of that cycle. Let us see, then, if the opacity problem described above can be solved if the constraints apply in a cyclic fashion.

In certain cases cyclic application of constraint evaluation can indeed account for opacity. Consider, for instance, the form *veter+ok* ‘wind, dim., nom. sg.’, which we have used to illustrate overapplication. On the first cycle *veter* is the optimal candidate, because the yer must be realized in order to eliminate the consonant cluster in coda position. Being the optimal candidate it constitutes the underlying form of the next cycle, together with the underlying representation of the diminutive. Constraint evaluation on the second cycle yields *veter+ok* as the optimal candidate, as is shown in the following tableau.

(24)

veterOk	DEP-V	NOCOM COD	DEP- ₋	MAX-V
veterk		*!		*
* veterok			*	

⁸ The dotted line indicates that the ranking order between the two relevant constraints cannot be

Although cyclic constraint evaluation sometimes derives the correct results, it is quite unsatisfactory in other cases. The gen. sg. *veter+k+a*, for instance, cannot be derived by cyclic constraint evaluation, because on the cycle created by the diminutive the second yer is vocalized, deriving *veter+ok*, as we have just seen. Consequently, on the cycle created by the inflectional ending the second yer can no longer be distinguished from a stable vowel. This means that the gen. sg. will be realized as **veter+ok+a*, which is blatantly wrong, of course.

We face the same problem in the example *ba_en+k+a*, the form with which we have illustrated positional opacity (cf. 20)). On the first cycle, *ba_En*, the yer would correctly be vocalized, because otherwise a consonant cluster in coda position would arise. However, on the cycle created by the diminutive things go wrong. This is shown in the following tableau:

(25)

ba_enOk	DEP-V	NOCOM COD	DEP- <u> </u>	MAX-V
ba_enk		*!		*
✱ ba_enok			*	

Since the second yer is vocalized on the second cycle, it is impossible to distinguish it from a stable vowel on the third cycle, created by the inflectional ending. Consequently, **ba_en+ok+a* would be derived, which again is ill formed.

In more general terms we can say that the fundamental problem of cyclic constraint evaluation is the following: it cannot account for the fact that a yer is always vocalized if it is immediately followed (neglecting an intervening consonant) by a morpheme which starts with a stable vowel. It thus incorrectly vocalizes the second yer in **veter+ok+a* and **ba_en+ok+a*, although it correctly vocalizes the first yer in these forms and both yers in the example *veter+ok*.

One might suggest that this problem can easily be solved if it is assumed that inflectional endings are non-cyclic. On this assumption an inflectional ending would be evaluated on the same cycle as the preceding morpheme. While this strategy would work in the cases we have seen so far, it is quite obvious that it cannot be maintained in those cases where a yer is followed by a *derivational* affix that starts with a stable vowel. Here are a few examples showing that vowel-initial derivational suffixes always block vocalization of an immediately preceding yer. (26a) demonstrates that a yer preceding a vowel-initial derivational suffix is not vocalized; (26b) proves that the relevant basic items must have an underlying yer, since they exhibit the vowel-zero alternation.

- (26) a kogt+ist+_j ‘sharp-clawed’
 orl+ic+a ‘she-eagle’
 redk+ost’ ‘sparseness’
 lovk+a_ ‘resourceful man’
 pu_k+ar’ ‘gunner’

b	kogot'	'claw, nom. sg.'	kogt'+a	gen. sg.
	or'ol	'eagle, nom. sg.'	orl+a	gen. sg.
	redk+ij	'sparse, long form'	redok	short form
	lovk+ij	'adroit, long form'	lovok	short form
	pu_k+a	'gun, nom. sg.'	pu_ek	gen. plur.

For the forms given in (26a) the solution hinted at above is not available. To see this more clearly consider the form *lovk+a_* 'resourceful man'. The basic item of this form has a yer in its domain, because the short form is realized as *lovok*, as shown in (26b). On the first cycle, *lovOk*, the yer is vocalized in order to eliminate the consonant cluster. This being the case, it is impossible on the second cycle to distinguish the vocalized yer from a stable vowel. Consequently, incorrect **lovok+a_* is derived.

The forms in (26) are indicative of a very important aspect of yer vocalization: a yer is never vocalized before an affix starting with a stable vowel. In this respect inflectional endings behave in exactly the same way as derivational affixes. This means that the solution hinted at above cannot be maintained, because it cannot explain the uniform behavior of inflectional and derivational affixes.

We can therefore conclude that in an analysis based on syllable optimization cyclicity cannot explain the opaque patterns of yer vocalization attested in a sequence of two consecutive yers.

Yet we do not wish to give up Yearley's constraint based account of yer vocalization for the reasons explained above. We have seen that the rule based account, although descriptively adequate, is not really explanatory. It just restates the attested facts, so to speak. The analysis based on syllable optimization has a much higher degree of explanatory adequacy, because it relates yer vocalization to syllable structure. Let us see, then, whether there are other ways to explain the opacity problem.

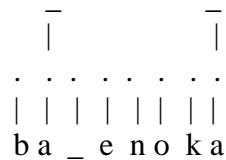
3. An account in terms of Faithfulness

In this section I show that the opacity problem described in the preceding section can be explained in terms of two faithfulness constraints: ANCHOR, which requires that morphological structure be faithfully mapped onto prosodic structure, and OO-Correspondence, which requires that morphologically related forms are faithful to each other.

3.1. ANCHOR

We have seen that the distribution of vocalized yers is opaque in two respects: firstly, yer vocalization overapplies, and secondly, sometimes the position of the vocalized yer is unexpected. I will start the analysis with the latter problem. Recall that this problem appears in forms with two consecutive yers followed by a stable vowel. The example we have used to illustrate the problem is *ba_En+Ok+a*, realized as *ba_en+k+a*, rather than **ba_n+ok+a* (cf. the tableau in (20)). This example has the following underlying representation:

(27) *underlying representation of ba_en+k+a*



Let us now have a closer look at the difference between the two candidates that, so far, cannot be differentiated by the analysis based on syllable optimization. I propose that they differ in the following way:

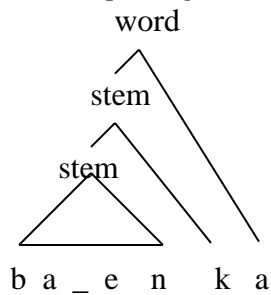
(28) *surface representations*
a the optimal candidate *b the suboptimal candidate*



In the optimal candidate there are two constituent edges sharing the same position. In other words, they are aligned with each other. In the suboptimal candidate, on the other hand, this is not the case. What is the nature of the constituents whose edges are aligned? I propose that one constituent is morphological in nature. More in particular it is a *stem*. In this example, then, *ba_En* is the stem of the suffix *-Ok*. The shorthand representation of a stem edge will be a square bracket. The other constituent is phonological in nature. It is a *prosodic word*, whose edge will be represented as '|'.

I am assuming, then, that the morphological structure of the optimal candidate is as follows:

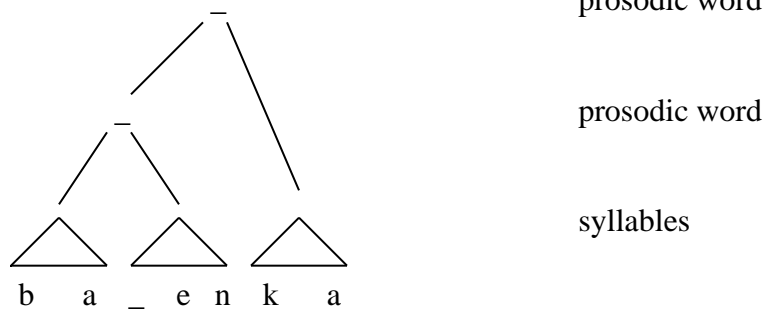
(29) *the morphological structure of ba_en+k+a*



The proposal, then, is that in Russian the morphological base of every affix, be it derivational or inflectional, is a stem.

In my proposal *ba_en+k+a* has the following *prosodic* representation:

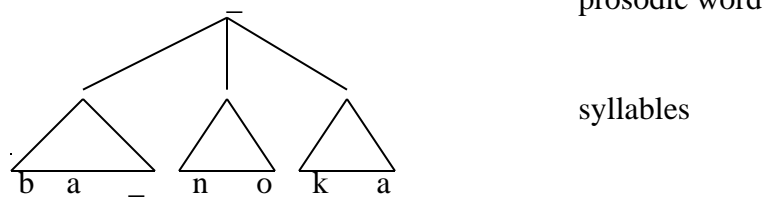
(30) *the prosodic structure of ba_en+k+a*



In this structure, which is the more formal equivalent of the shorthand notation in (28a), the right edge of the constituent *ba_en*, which is the stem of the diminutive affix *-k* (underlyingly *-Ok*), is aligned with the right edge of a prosodic word. Now, all segments must be licensed prosodically, which means, among other things, that they must be dominated by a prosodic word (Itô 1986). To satisfy this condition a new instance of a prosodic word must be built dominating the prosodic word that encompasses the stem of the diminutive.

In the suboptimal candidate in (28b), on the other hand, the stem of the diminutive is *not* aligned with a prosodic word. The more formal equivalent of (28b) looks as follows:

(31) *the prosodic structure of suboptimal *ba_n+ok+a*



In this structure the second yer is realized. As a result the final segment of the stem *ba_n* is located in the onset of the syllable created by the vocalized yer. Since the stem-final segment occupies the onset position, and since, furthermore, prosodic words dominate syllables, it follows that vocalization of the second yer blocks alignment of the stem with a prosodic word.

In sum, there is a subtle difference between the two candidates *ba_en+k+a* and **ba_n+ok+a*; in the former the stem of the diminutive suffix is aligned with a prosodic word. Since this is the only phonological difference between these two candidates this must be the reason why in a sequence of two consecutive yers followed by a stable vowel only the first yer can be vocalized.

The constraint enforcing alignment is formulated in (32) (cf. McCarthy 2000 on the ANCHOR-family).

(32) ANCHOR

If a segment occupies the right edge of a stem, then its correspondent should occupy the right edge of a prosodic word.

Obviously, in Russian this constraint must be ranked higher than the constraint NORECURSION, which penalizes representations where a prosodic constituent of some category X dominates another prosodic constituent of the same category. With

the opposite ranking the representation in (31) would become optimal, rather than the one in (30). The following formulation of NORECURSION is taken from Selkirk (1995).

- (33) NORECURSION
No C^i dominates C^j , $j = i$.

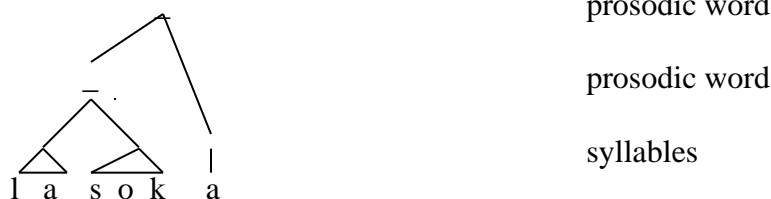
The tableau in (34) shows that, in Russian, ANCHOR must dominate NORECURSION.

- (34) ANCHOR » NORECURSION

ba_EnOka	ANCHOR	NORECURSION
.ba._n]o.ka. (= 31)	*!	
* .ba._en.][ka . (= 30)		*

It is very important that *only* affixes starting with a yer should have any effect on ANCHOR. The stem of an affix starting with a stable vowel should not be aligned with a prosodic word. Suppose that an affix starting with a stable vowel would trigger alignment of its stem with a prosodic word. Basically it would entail that a yer preceding such an affix would always be vocalized. To see this consider a simple case like *lask+a* ‘weasel, nom. sg.’. This form must have a yer, since in the gen. plur., *lasok*, the yer surfaces (cf. (3) for the same example). If the stem of the inflectional ending would be aligned with a prosodic word, then the final segment of the stem would also be the final segment of a prosodic word, and by extension also the final segment of a syllable. As a result, a consonant cluster in coda position would arise, unless the yer would be vocalized. Since yer vocalization is less costly than a complex coda we would end up with **lasok]/a/*, or more formally:

- (35) *if ANCHOR would be highly ranked*



This result is completely wrong, of course.

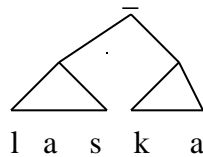
We have seen in the preceding section that a yer is never vocalized before an affix starting with a stable vowel. This then means that affixes having this structure should not trigger alignment of their stem with a prosodic word. How can we block alignment of a stem and a prosodic word before a vowel-initial affix? Notice that in this environment alignment creates a vowel-initial syllable in the domain of the affix triggering alignment. Thus, in (35) the inflectional ending starts its syllable with a vowel. This constitutes a violation of the constraint ONSET:

- (36) ONSET
A syllable should have an onset

If we now rank ONSET above ANCHOR, the effect will be that the stem of a vowel-initial suffix is not aligned with a prosodic word. Instead of a representation like (35)

we therefore get:

(37) *ANCHOR is dominated by ONSET*



prosodic word

syllables

Since ONSET forces the consonant preceding the vowel-initial suffix to occupy the onset, there is no threat of a complex coda. Therefore, there is no need to vocalize a yer. Consequently, the yer is correctly deleted. The tableau in (38) demonstrates that ONSET must dominate ANCHOR.

(38) ONSET » ANCHOR » NORECURSION

lasOka	ONSET	ANCHOR	NORECURSION
.la.sok.]a . (= 35)	*!		*
✱ .las.k]a . (= 37)		*	

We can see, then, that the effect of ANCHOR is such that in the environment of two consecutive yers followed by a stable vowel, a prosodic word is build over another prosodic word. Following Selkirk (1995:443) I assume that a constituent of category C^{i-1} is the head of a constituent of category C^i . This means that in a structure in which one instance of a prosodic word dominates another, the latter is the head of the former. In a representation containing just one prosodic word there is no head of the $_$ -category. This distinction between these two types of prosodic structure will become very important in the next section.

In this section I have suggested that the positional opacity attested in a sequence of two consecutive yers followed by a stable vowel can be explained with a constraint of the ANCHOR family. In particular I have argued that the stem of an affix is aligned with a prosodic word. The ANCHOR constraint is located in the hierarchy in such a way that only yer-initial suffixes can actually trigger alignment. Suffixes beginning with a real vowel are not able to do so. The crucial rankings are:

(39) *The grammar of the morphology-phonology interface*
 ONSET » ANCHOR » NORECURSION

Let us now turn to the second instance of opacity: overapplication of yer vocalization.

3.2. OO-Correspondence

We have seen that sometimes yer vocalization overapplies. This happens if a sequence of two consecutive yers is located in word final position (cf. the tableau in (22)). In this section I will propose that overapplication can be explained in terms of OO-Correspondence.

OT-theoreticians agree that morphologically related output forms are in some kind of correspondence relation. There is not very much agreement, however, as to the precise definition of this relation. Benua (1995, 1997) and Kager (1999) propose

that the relation is unidirectional, in the sense that a morphologically basic form can determine the structure of the morphologically derived form, but not vice versa. Fleming (1995), Burzio (1996) and Kenstowicz (1996), on the other hand, propose that the relation holds in two directions.

To explain overapplication of yer vocalization I propose a version of OO-Correspondence that comes very close to Flemming's proposal.

(40) PARADIGM UNIFORMITY

The instances of the stem of an inflectional paradigm are in an OO-Correspondence relation.

To see what the implications of PARADIGM UNIFORMITY (PU) are, consider the pair *veter* 'wind, nom. sg.' and *vetr+a* 'wind, gen. sg.' (cf. (21)). In the form *vetr+a* the string *vetr* is the stem of *vetr+a*. Similarly, in *veter* the string *veter* is the stem of a zero-affix denoting the nom. sg. masc. These two strings *veter* and *vetr* are instances of the same underlying stem and both strings are also the stem of an inflectional paradigm. Accordingly, they are subject to PU defined above. This, then, means that they are subject to a whole set of faithfulness constraints, requiring that they should be identical to each other.

Now consider the pair *vetr+a* 'wind, gen. sg.' and *veter+k+a* 'wind, dim., gen. sg.' According to the definition in (40), the string *vetr* of the gen. sg. is not in a correspondence relation with the string *veter* in *veter+k+a*, because the latter is not the stem of an inflectional ending; it is the stem of a derivational affix.

In the pair *veter+ok*, *veter+k+a*, on the other hand, the two strings *veterok* and *veterk* are in a correspondence relation because they are instances of the same stem, and because they are both the stem of an inflectional ending. Let us now see how the definition proposed in (40) can help us to answer the question why yer vocalization overapplies.

Consider the sequence consisting of two consecutive yers in word final position, that is, a case like *vetEr+Ok*, which is realized as *veter+ok*, rather than the expected **vetr+ok* (cf. the tableau in (22)). According to our definition of OO-Correspondence *veter+ok* corresponds to the stem *veter+k* in *veter+k+a*, or any other inflected form of the diminutive, like *veter+k+u* (dat. sg.), *veter+k+e* (loc.sg.) etc, because they are instances of the same inflected stem. Given this correspondence relation it might be possible to explain the presence of the unexpected vocalized yer in *veter+ok* on the basis of the vocalized yer in *veter+k+a*. The constraint enforcing the realization of the extra yer would then be MAX-V(OO), that is, the version of MAX-V requiring identity with respect to the number of vowels between two forms that are in an OO-Correspondence relation.

(41) MAX-V(OO)

A vowel in a string S_1 should correspond to a vowel in a string S_2 if S_1 and S_2 are in an OO-correspondence relation.

On closer view, however, this solution does not seem to be possible. Notice that according to the definition of PU in (40) a correspondence relation between two output forms is multidirectional; both members of the related pair have equal rights. Therefore, if the first vocalized yer of *veter+ok* is a reflection of the vocalized yer in *veter+k+a*, which must be vocalized in order to avoid a consonant cluster in coda position, then the reverse implication should also hold: the second vocalized yer of

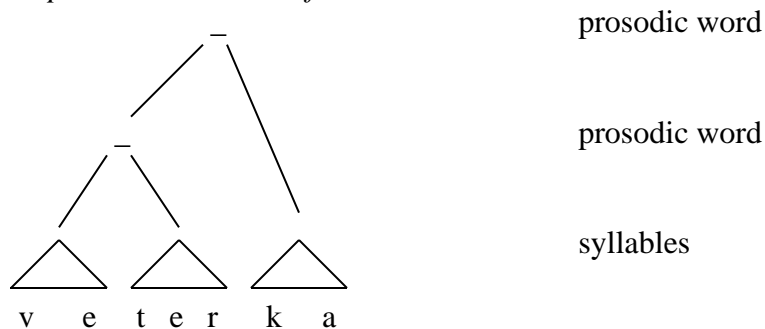
veter+ok, which also must be vocalized in order to avoid a consonant cluster in coda position, should also be reflected by a vocalized yer in *vetEr+Ok+a*. In other words, we would expect the surface form **veter+ok+a*.

The same problem would appear in all cases where a yer in the stem is followed by a stable vowel in the affix. In the pair *veter-vetr+a*, for instance, the presence of the yer in the form *veter*, would be reflected in *vetr+a*. We would thus get **veter+a*.

In fact, we would like to see the effects of OO-Correspondence only if a sequence of two consecutive yers is followed by a stable vowel. Only in this environment can the vocalized yer of the sequence trigger vocalization of a yer in a morphologically related form. To illustrate this with a few examples: *vetEr+Ok+a* is realized as *veter+k+a*. This form meets the environmental condition just mentioned. The vocalized yer of this form, then, is able to trigger vocalization of the first yer in *vetEr+Ok*, giving *veter+ok*. Conversely, the second yer in *vetEr+Ok* is not able to trigger vocalization of the second yer in *vetEr+Ok+a* (giving incorrect **veter+ok+a*), because now the environment is not met: in *vetEr+Ok* there is no stable vowel following the sequence of consecutive yers. Hence, the second vocalized yer of *veter+ok* is not able to trigger vocalization of the second yer in *vetEr+Ok+a*. The same reasoning applies to other cases. Thus, the yer in *vetEr* has no effect on the yer in *vetEr+a*.

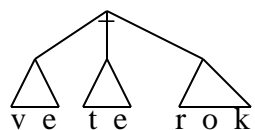
How, then, should we characterize the relevant environment at a more formal level? The answer has already been given in the preceding section. In a sequence of two consecutive yers followed by a stable vowel the first yer is vocalized in order to allow the consonant following it to be aligned with a prosodic word. This creates a multi-layered prosodic structure of the *_*-category. Accordingly, *vetEr+Ok+a* has the following surface prosodic structure (cf. also (30) for a similar example):

(42) *the prosodic structure of veter+k+a*



Compare this with the surface prosodic structure of forms where OO-Correspondence does not have any effect, in the sense that they contain a yer which is not copied by the morphologically related forms. A relevant example is *vetEr+Ok*, where the second yer is not copied by a morphologically related form like *veter+k+a*.

(43) *the prosodic structure of veter+ok*



In *veter+ok* the vocalized yer of the diminutive triggers syllabification of the

preceding consonant in onset position, in order to satisfy ONSET. Since the consonant must occupy the onset position, it cannot be aligned with the right edge of a prosodic word. As a result a flat prosodic word is built.

The formal characterization of the environment where a vocalized yer is imitated by another yer in a morphologically related form should be clear by now. A vocalized yer is copied if it is located in an *embedded* prosodic word. This is why the first yer in *veter+k+a* triggers vocalization of the first yer in *veter+ok*. Conversely, the second vocalized yer in *veter+ok* does not trigger vocalization in *veter+k+a*, because this yer is not located in a multi-layered prosodic word. Having found the precise environment where a yer triggers opaque vocalization of another yer in a morphologically related form we can now consider the constraint that is responsible for this behavior.

Alderete (1995) proposes that segments located in a prosodic head are subject to a special (sub)family of faithfulness constraints. Let us follow this proposal and adopt the following constraint:

- (44) HEADMAX-V(OO)
A vowel located in a head of category _ (the prosodic word)
 in a string S_1 should correspond to a vowel in a string S_2
 if S_1 and S_2 are in an OO-correspondence relation.

This constraint is a special version of the more general MAX-constraint formulated in (41). The crucial difference between this constraint and the general MAX-constraint is in italics.

Now consider the prosodic structure of *veter+k+a* again, given in (42). In this form the two vowels located in the lower prosodic word are subject to HEADMAX-V(OO). On the other hand, none of the vowels in the structure in (43) is subject to this constraint, because there is no prosodic word that is also a head. This, then, is the reason why the yer in (42) triggers opaque vocalization of a yer in a morphologically related form, whereas the yer in the flat representation in (43) is not able to do so.

Of course, the special MAX-constraint must be properly ranked. In any case it must dominate DEP-_, the constraint requiring that a mora in the output correspond to a mora in the input. The reverse ranking would block opaque yer vocalization, as is shown in the tableau in (45).

- (45) HEADMAX-V(OO) » DEP-_
 ✱

vetErOk <i>input (nom. sg)</i>	HEADMAX-V(OO)	DEP-_ ✱
veter]]ka <i>output (gen. sg)</i>		
vetrok	*!	*
✱ veterok		**

In this tableau the upper box in the leftmost column contains two representations. One is the underlying representation of the nom. sg. *vetEr+Ok*, a form with two consecutive yers. The other is the output representation of *vetEr+Ok+a*, the gen. sg. of *vetEr+Ok*. The two candidates underneath the upper box are in an input-output relation with the input form given in the upper box, and they are in an output-output relation with the output representation given in the upper box.

The first candidate **vetrok* realizes only a single yer, the one that helps to eliminate the consonant cluster in coda position. Consequently, it violates DEP-_ only

once. However, it does not realize the first yer of its underlying representation. Consequently, it does not imitate the vocalized yer of the morphologically related form *veter+k+a*, which means that it violates HEADMAX-V(OO). In the second candidate both yers of the underlying representation are realized, and it therefore violates DEP-_{_} twice. Vocalization of the second yer is phonologically motivated (it eliminates the cluster in coda position), and the vocalization of the first yer is a reflection of the vocalized yer in the morphologically related form *veter+k+a*. Due to this opaque vocalization of the first yer the second candidate does not violate HEADMAX-V(OO). Since this constraint dominates DEP-_{_} this candidate is optimal.

Now consider why the second vocalized yer in *veter+ok* is not reflected by a vocalized yer in *veter+k+a*.

(46)

vetErOka	<i>input(gen. sg)</i>	HEADMAX-V(OO)	DEP- __
veter]ok	<i>output (nom.sg)</i>		
veteroka			**!
* veterka			*

Here we take *vetEr+Ok+a* as the underlying form, and *veter+ok* as the surface form with which the surface candidates are in an output-output correspondence relation. In *veter+ok* the second yer is vocalized on phonological grounds; it blocks the appearance of a consonant cluster in coda position. We have seen in (43) that this vocalized yer is not located in a prosodic head of the ₋-category. This being the case it is not subject to HEADMAX-V(OO). Consequently, in (46) the two candidates vacuously satisfy this constraint. Therefore, lower ranked DEP-_{_} takes over. In the first candidate this constraint is violated twice, whereas the second candidate violates it just once. Consequently, the second candidate is the optimal one.

In sum, a vocalized yer can trigger opaque vocalization of a yer in a morphologically related form only if it is located in the head of a prosodic word. This can only happen if it is followed by another yer, which in its turn is followed by a suffix containing a stable vowel. Thus, in a case like *veter+k+a*, the vocalized yer triggers opaque vocalization of the first yer in the morphologically related form *veter+ok*. On the other hand, the second vocalized yer in *veter+ok* has no effect on the second underlying yer in the morphologically related form *vetEr+Ok+a*, which is therefore realized as *veter+k+a*. Similarly, the vocalized yer in a form like *veter* is not copied in the gen. sg. *vetr+a*, or other instances of the same inflected stem, because the vocalized yer is not located in a prosodic head of the ₋-category.

In this section I have argued that overapplication of yer vocalization can be explained in terms of Output-Output Correspondence. I have claimed that a vocalized yer which is located in a prosodic head of the ₋-category in some form is copied by another form if the two forms are in a correspondence relation with each other.

4. Conclusion

In this article I have shown that from the perspective of Yearley's analysis yer vocalization is opaque in two ways: sometimes the position of the vocalized yer is unexpected (positional opacity), and sometimes the number of vocalized yers is unexpected (overapplication). I have argued that both types can be reconciled with

Yearley's analysis, which claims that in essence a yer is vocalized in order to eliminate a consonant cluster in coda position. The former type is a consequence of ANCHOR, the family of constraints requiring alignment of prosodic and morphological boundaries. As a result of ANCHOR a multi-layered prosodic word is built if two yers in a row are followed by a stable vowel. This configuration explains why in this environment only the first yer can be vocalized. I have proposed that the second type of opacity can be explained in terms of OO-Correspondence. I have suggested that a vocalized yer located in a prosodic head of the $_$ -category is copied if the conditions mentioned in PARADIGM UNIFORMITY are met. This entails that a yer can be vocalized even though vocalization does not resolve a consonant cluster in coda position. This happens when a form is in an OO-Correspondence relation with another form that contains a yer located in a prosodic head of the $_$ -category.

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