

STRUCTURE AND STRESS IN THE PHONOLOGY OF RUSSIAN

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ABSTRACT

This thesis investigates the interaction between phonology and morphology in the stress system of Russian. Russian has an accent-based stress system, in which morphemes are characterized by two accentual properties: [\pm accented, \pm dominant]. Dominant morphemes trigger de-accentuation of the stem to which they attach.

Words surface with one stress, regardless of whether they contain zero or several lexically accented morphemes. I show that the stress rule in Russian applies cyclically, assigning stress to the leftmost accented vowel. Words with accented roots have stress fixed on the root. In the inflectional paradigm of words with unaccented roots, stress alternates between the initial and final vowels, depending on the accentual property of the inflectional suffix. I refer to this as mobile stress.

In Chapter One I observe an important correlation between stress and the derivational status of words. The generalization is the following: mobile stress occurs only in nonderived words or words derived from a nonsyllabic derivational suffix. To account for this fact, I show that it is crucial to assume not only that the stress rule is cyclic, but that all suffixes are cyclic. My analysis poses a challenge to theories which argue that morphemes which delete previously assigned metrical structure are necessarily cyclic while those which preserve previously assigned structure are noncyclic.

I adopt the framework of autosegmental phonology, whereby segmental, syllabification, and metrical processes operate on independent planes linked to a series of timing slots. Since vowels are the only stressable elements in Russian, they are the only elements represented on the

stress plane. This allows us to explain the fact that a nonsyllabic morpheme which triggers a cyclic rule on the segmental plane fails to trigger the cyclic stress rule, which operates on the stress plane.

In Chapter Two I introduce a class of apparent counterexamples to the claim that mobile stress can only occur in words derived from a nonsyllabic suffix. All of the problematic cases involve morphemes which exhibit vowel-zero alternations. I argue that these morphemes contain abstract vowels which consist of a floating feature matrix. Furthermore, I present both segmental and metrical evidence to show that there are three distinct abstract vowels in Russian. They have the representations (where $\Phi = \{-hi, -lo, \pm bk\}$):

	(i)	(ii)	(iii)
SYLLABLE PLANE:		N	N
SKELETON:		X	X
SEGMENTAL PLANE:	Φ	Φ	

Chapter Three addresses certain complexities in the adjectival system, which involve rules of post-accentuation and retraction.

Verbs exhibit stress alternations not found among other lexical categories. These alternations result from vowel sequences which are unique to derived verb stems. In Chapter Four, I show that stress assignment in these verbs involves a complex interaction between the stress rule, syllabification, and vowel truncation rules.

The thesis thus provides strong evidence for current theories of abstract elements in phonology, and suggests a different view of cyclicity than the one recently proposed by Halle and Vergnaud (1987) and Halle and Kenstowicz (1989). These authors have argued that only the dominant (stress-deleting) morphemes are cyclic. This thesis shows that both dominant and nondominant morphemes constitute cyclic domains, but the structural properties of a morpheme may prevent application of a cyclic rule on a particular plane.

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Chapter 1

CYCLICITY AND STRESS IN RUSSIAN

1.1 Introduction

Russian words (except for compounds) contain exactly one stressed vowel. The position of the stress cannot be predicted on the basis of the phonological properties of the word or from syllable counting. In fact, there are numerous examples of homophonous words with contrasting stress. Examples are shown in (1).¹

(1) Minimal Stress Pairs

- (i) zérkala (gen sg) 'mirror'
 zerkalá (nom pl)
- (ii) bágrít' 'to spear fish'
 bagrít' 'to paint crimson'
- (iii) glázki 'little eyes'
 glazkí 'peepholes'

In this chapter I will show that the stress system of Russian involves the interaction between lexically-determined accentual

properties of morphemes and a rule which assigns stress to the leftmost accented vowel or, in the absence of an accent, to the leftmost vowel.

1.2 Lexical Accent and Stress Assignment

1.2.1 Patterns of Nominal Stress

Let us begin with the problem of nominal stress. If we examine the complete inflectional paradigms of nouns in Russian, we can identify four basic patterns of stress.^{2 3} These are presented in (2).⁴ Included in the table is the approximate number of nouns exhibiting each pattern.⁵ In the examples, the plus sign separates the stem and inflection.

(2) Four Main Types of Nominal Stress

(i) FIXED ON THE STEM

example: rabót+a (f) (nom sg) 'work'
 rabót+y⁶ (nom pl)

approximate number: several thousand. About 90% of the nouns in the Russian dictionary exhibit this stress pattern.

(ii) FIXED ON THE INFLECTION (i.e. on the final vowel)

example: čert+á (f) (nom sg) 'line'
 čert+ý (nom pl)

approximate number: 2,000

(iii) ALTERNATING BETWEEN THE INITIAL AND FINAL VOWEL

example: borod+á (f) (nom sg) 'beard'
 bórod+y (nom pl)

approximate number: 450

(iv) ALTERNATING BETWEEN THE FINAL AND PENULTIMATE VOWEL

example: koles+ó (n) (nom sg) 'wheel'
 kolës+a' (nom pl)

approximate number: 250

I will adopt the term mobile stress to refer specifically to pattern (iii) and shifting stress to pattern (iv).

There are two additional facts about stress alternations in nouns which are important to keep in mind. First, all nouns with shifting stress have stress on the final vowel throughout the singular and penultimate stress throughout the plural. Second, there are various patterns of mobile stress, and each pattern correlates with a particular nominal gender. In other words, given two nouns which exhibit stress alternations between the initial and final vowel, in a particular case form one may have stress on the initial vowel and the other on the final vowel. Before proceeding with an analysis of these data, I will digress briefly in order to acquaint the reader with the basic facts of Russian nominal declension.

1.2.2 Russian Declension

In the singular, masculine (m) and neuter (n) nouns share almost the same set of inflections (the differences occur in the nominative and accusative).⁸ They are traditionally treated as belonging to one declension. Feminine (f) nouns fall into two different declensions. One of these, which I refer to as F_b in Table (3), is limited to nouns with stems ending in a soft (i.e. palatalized) or sibilant consonant. In the plural, virtually all nouns share the same inflections in the dat, loc, and instr. In the other pl case forms, the situation is more complicated. Most m and f_a nouns take the same inflections in the nom and acc, while n and f_a nouns generally take the same inflections in the gen.

A table of nominal inflections is given in (3).⁹

(3) Nominal Inflections

	SG				PL			
	M	N	F_a	F_b	M	N	F_a	F_b
NOM	ϕ	ϕ	a	ϕ	y/a	a	y	i
ACC	ϕ	o	u	ϕ	y/a	a	y	i
GEN		a	y	i	ov	ϕ	ϕ	ej
DAT		u	e	i			am	
INSTR		om	oj	ju			ami	
LOC		e	e	i			ax	

1.2.3 The Basic Accentuation Principle (BAP)

To account for the stress patterns in (2), let us begin by assuming that in Russian morphemes are accented or unaccented.¹⁰ I will define accent as a diacritic feature denoting metrical prominence. An accent is associated with a particular vowel in the underlying representation of a morpheme. Stress I will define as the phonetic interpretation of metrical prominence.

Based on work by Kiparsky and Halle (1977) (hereafter KH) on Proto-IndoEuropean stress, I will assume that Russian has retained the Indo-European stress rule. KH refer to this as the Basic Accentuation Principle (BAP). This rule assigns stress to the leftmost accented vowel. A preliminary formulation is given in (4).

(4) Basic Accentuation Principle (BAP)

Assign stress to the leftmost accented vowel; if there is no accented vowel, assign stress to the initial vowel.

For the time being I will limit the discussion to nouns which consist simply of a root and inflection (i.e. nonderived nouns), and I will simply stipulate that the BAP does not apply on the first cycle. Later on I will provide evidence which shows that the BAP is a cyclic rule which is subject to the Strict Cycle Condition.

Suppose a noun has an accented root. Since the BAP assigns stress to the leftmost accented vowel, we predict that stress will fall

on the accented vowel of the root in all forms of the inflectional paradigm. In this case, the accentual property of the inflection has no effect on stress assignment. We can account for stress pattern (2i) by assuming that these nouns have accented roots.

Suppose the root is unaccented. In this case, stress assignment will depend the accentual property of the inflection. If the inflection is accented, it will get stress. If it is unaccented, the default clause of the BAP will assign stress to the initial vowel. If there are both accented and unaccented inflectional suffixes, then we expect to find nouns exhibiting stress on the final vowel in certain case forms and on the initial vowel in others. This prediction is confirmed by pattern (2iii) (i.e. mobile stress).

To illustrate, I will present derivations of two forms of a noun with mobile stress (borodá 'beard'), one form having an accented inflection and the other an unaccented inflection. An accented vowel is marked with an asterisk. The BAP assigns stress either to the left-most accented vowel or, if there is no accented vowel, to the initial vowel. These derivations are simplified in order to avoid unnecessary complications at this early stage in the analysis. Once I have laid out the basic system, I will turn to the issue of the formal representation of stress.

(5) Derivation of Stress in a Noun with an Unaccented Root

ROOT: [borod] (-acc) 'beard'

NOM SG

NOM PL

INFLECTION: [a] (+acc)

INFLECTION: [y] (-acc)

CYCLE 2 ^{*}
[[borod] a]

CYCLE 2 [[borod] y]

BAP [[borod] á]

BAP [[bórod] y]

borodá

bórody

Notice that if the BAP were to apply on the first cycle, mobile stress would never occur. In nouns with unaccented roots, the default clause of the BAP would assign stress to the initial vowel in all forms of the inflectional paradigm, and therefore these nouns would exhibit fixed stress on the initial vowel.

I mentioned earlier that there are various patterns of mobile stress. In fact, there are three distinct patterns, with each pattern generally limited to nouns of a particular gender. The data are summarized in (6). Since abbreviated paradigms are sufficient to illustrate each pattern, I give only the nom, gen, and dat forms (and acc for f nouns) for each example.

(6) Patterns of Mobile Stress

- (i) PATTERN: stress on the initial vowel in sg; on the inflection in the pl

DISTRIBUTION: n nouns and those m nouns which take a in nom & acc pl

EXAMPLES:

<u>zérkalo</u> (n) 'mirror'			<u>górod</u> (m) 'city'		
	SG	PL		SG	PL
NOM	zérkal+o	zermal+á	NOM	górod+ø	gorod+á
DAT	zérkal+u	zermal+ám	DAT	górod+u	gorod+ám
INSTR	zérkal+om	zermal+ámi	INSTR	górod+om	gorod+ámi

- (ii) PATTERN: stress on the initial vowel in sg and nom pl; elsewhere on the inflection

DISTRIBUTION: m nouns

EXAMPLE: vólos (m) 'hair'

	SG	PL
NOM	vólos+ø	vólos+y
GEN	vólos+a	volos+óv
DAT	vólos+u	volos+ám

- (iii) PATTERN: stress on the initial vowel in acc sg, nom & acc pl; elsewhere on the inflection¹¹

DISTRIBUTION: f nouns

EXAMPLE: borodá (f) 'beard'

	SG	PL
NOM	borod+á	bórod+y
DAT	borod+é	borod+ám
INSTR	borod+ój	borod+ámi
ACC	bórod+u	bórod+y

My analysis provides a simple account of these facts. Certain case forms have more than one inflectional suffix, and the choice of inflection is linked to the gender of the noun. This is shown by the

table of inflections in (3). Certain inflectional suffixes are accented, while others are unaccented. Given that nouns with mobile stress have unaccented roots, the pattern of mobile stress which a particular noun exhibits will be a function of the accentual properties of the inflectional suffixes selected by that noun. Since the set of inflectional suffixes is determined largely by gender, each mobile stress pattern will correlate with a particular gender.

Below is a table showing the accentual properties of nominal inflections. An asterisk in parentheses indicates that the morpheme has both accented and unaccented alternants. The basis for determining the accentual properties of these inflections is the pattern of mobile stress exhibited by nouns of each gender. Complete paradigms are given in Appendix 1.8.

(7) The Accentual Properties of Nominal Inflections

	SG M	SG N	SG F _a	SG F _b	PL M	PL N	PL F _a	PL F _b
NOM	φ	o	* a	φ	* y/a	* a	y	i
ACC	φ	o	(*) u	φ	y	* a	y	i
GEN	a		* y	i	* ov	φ	φ	* ej
DAT	u		* e	i		* am		
INST	om		* oj	ju		* ami		
LOC	e		* e	i		* ax		

There remain two patterns of nominal stress to account for:

1. fixed on the inflection, as in (2ii); and
2. alternating between the inflection (i.e. final vowel) and the penult, as in (2iv)

Recall that I have adopted the term shifting stress to refer the latter.

1.2.3.1 Post-Accentuation

Based on the analysis developed thus far, both of these patterns are unexpected. Consider the case of fixed stress on the inflection. We have already established that there are both accented and unaccented inflectional suffixes. Therefore, we cannot account for this pattern simply by assuming that it occurs in nouns with unaccented roots. On the other hand, if these nouns have accented roots, we expect to find stress fixed on the root.

We can solve this problem by positing a rule which transfers stress one syllable to the right. A preliminary formulation of this rule, which I will call Post-Accentuation, is given below.¹²

(8) Rule of Post-Accentuation

$$[\dots\acute{\sigma}_{n-1} \sigma_n] \rightarrow [\dots\sigma_{n-1} \acute{\sigma}_n]$$

I will then posit a subclass of accented morphemes which are lexically marked to trigger this rule, and I will refer to them as post-accenting. It is important to emphasize that post-accenting morphemes are a subset of accented morphemes. I will identify them by placing a subscript *p* on the right-hand bracket in the underlying representation.

We will explore later on the question of where in the derivation post-accentuation occurs. For the time being, let us assume that the BAP

applies first. If the BAP assigns stress to a post-accenting morpheme, then the stress subsequently moves one syllable to the right.

Derivations are given in (9). I will use the symbol *-> to represent the rule of Post-Accentuation in the derivation.

(9) Derivations of a Noun with a Post-Accenting Root

ROOT: [čert] _P (+acc) 'line'			
	<u>NOM PL</u>		<u>DAT PL</u>
	*		* *
CYCLE 2	[čert] _P y]]	CYCLE 2	[čert] _P am]]
BAP	[čért] _P y]]	BAP	[čért] _P am]]
*->	[čert] _P ý]]	*->	[čert] _P ám]]
	<u>čertý</u>		<u>čertám</u>

We are now in a position to explain the fourth stress pattern (2iv). This pattern involves alternating stress, with stress falling on the inflection throughout the singular and on the stem-final (i.e. penultimate) vowel throughout the plural. For convenience, I repeat a partial paradigm of the noun kolesó 'wheel' in (10).

(10) Shifting Stress Pattern

	SG	PL
NOM	koles+ó	kolës+a
DAT	koles+ú	kolës+am

There are two hypotheses to consider. One is to assume that nouns exhibiting this stress pattern have accented roots which are subject to Post-Accentuation, but the rule of Post-Accentuation applies

only in the singular forms of the inflectional paradigm. We could assign the subscript p' to the roots of these nouns to distinguish them from those which undergo Post-Accentuation in all forms. This would account for stress in the example given in (10). Derivations are shown

in (11).¹³

(11) Derivations

	<u>DAT SG</u>		<u>DAT PL</u>
	* *		* *
CYCLE 2	[[koles] _p . u]	CYCLE 2	[[koles] _p . am]
BAP	[[kolés] _p . u]	BAP	[[kolés] _p . am]
*->	[[koles] _p . ú]	*->	n.a.
	<u>kolesú</u>		<u>kolësam</u>

Alternatively, we could assume that nouns exhibiting this stress pattern have accented roots which are subject to Post-Accentuation in all forms of the inflectional paradigm and posit a rule of retraction. This rule would apply in the plural forms of the nominal inflectional paradigm, shifting the stress one syllable to the left (in this instance, back onto the vowel which was originally assigned stress by the BAP).

Suppose we were to adopt the rule of Retraction shown in (12).

(12) Rule of Retraction

... $\sigma_1\acute{\sigma}_2$] ---> ... $\acute{\sigma}_1\sigma_2$]

Certain roots would be marked to undergo Retraction in the plural. I will use the subscript *r* to identify morphemes with this property. Since the examples we're looking at are all post-accenting roots, they will be marked with both the features *p* and *r*.

Below I show derivations of the same forms of kolesó as in (11), but including the rule of Retraction. I will represent the rule of Retraction by the symbol <-*.

(13) Derivations Involving both Post-Accentuation and Retraction

<u>DAT SG</u>		<u>DAT PL</u>	
	*		* *
CYCLE 2	[[koles] _{p/r} u]	CYCLE 2	[[koles] _{p/r} am]
BAP	[[kolés] _{p/r} u]	BAP	[[kolés] _{p/r} am]
*->	[[koles] _{p/r} ú]	*->	[[koles] _{p/r} ám]
<-*	n.a.	<-*	[[kolés] _{p/r} am]
	<u>kolesú</u>		<u>kolësam</u>

In the case of kolesó, either analysis would correctly assign stress. This would be true of any word in which the post-accenting root has the accent on the final vowel in the underlying representation of the root. Regardless of whether stress assignment in the plural involves the two steps of Post-Accentuation followed by Retraction, or simply results from the failure of the stem to transfer stress in the plural, the outcome will be the same.

In the nominal system, there appears to be no clear empirical basis for choosing one analysis over the other.¹⁴ However, we will see later on that there is evidence in the adjectival system for the Retraction rule in (12). Therefore, I will posit a subclass of post-accenting roots which have the additional lexical property that they trigger the rule of Retraction in the singular only. I will continue to identify these root morphemes with the subscript *p/r*. The fact that there are only about 250 nouns with a shifting stress pattern shows that, as we might expect, root morphemes of this type are relatively uncommon.

For convenience, I will adopt the following classification of morphemes, based on their accentual properties:

CLASS A: +accented

CLASS B: +accented, subject to Post-Accentuation

CLASS C: -accented

CLASS B': +accented, subject to Post-Accentuation and to Retraction in the plural

1.2.3.2 Two Minor Stress Patterns: Retraction in Nouns with Unaccented Roots

Having adopted the rule of Retraction in (12), we are able to extend the analysis to a small group of nonderived nouns (20 in all) exhibiting a stress pattern not previously discussed. In the singular paradigm, stress is either on the initial or final vowel (depending on

the declension of the noun). In the plural, stress is on the penult. We can explain what appear to be deviant patterns by assuming that these nouns have unaccented roots which trigger the Retraction rule in the plural. I will categorize these root morphemes as Class C' (Class C morphemes are unaccented). Two examples are given below, one neuter and the other feminine.

(14) Retraction in Nouns with Unaccented Roots

- (i) PATTERN: Stress on the initial in the singular; on the stem-final vowel in the plural

DISTRIBUTION: m & n nouns (7)

EXAMPLE: ózero 'lake'

	SG	PL
NOM	ózer+o	ozër+ta
DAT	ózer+u	ozër+am

- (ii) PATTERN: Stress on the root in the acc sg and throughout the plural; on the inflection elsewhere in the singular

DISTRIBUTION: f nouns only (13)

EXAMPLE: dušá 'soul'

	SG	PL
NOM	duš+á	dúš+i
DAT	duš+é	dúš+am
ACC	dúš+u	dúš+i

Nouns which exhibit these stress patterns I will refer to as Class C'.

1.2.4 Summary

We have examined the four major nominal stress patterns. These are summarized below.

Class A: Stress fixed on the stem

Class B: Stress fixed on the inflection

Class C: Stress alternating between the and the initial vowel of the word (Mobile Stress)

Class B': Stress alternating between the inflection in singular and the stem-final vowel in the plural (Shifting Stress)

I have accounted for each of these patterns by making three basic assumptions:

1. morphemes in Russian are either accented or unaccented in their underlying representation;
2. the rule of stress assignment is the Indo-European Basic Accentuation Principle (BAP); and
3. the BAP does not apply on the first cycle.

The BAP assigns stress to the first accented vowel, or if there is no accented vowel, to the initial vowel.

I argued that a subset of accented root morphemes are post-accenting. These morphemes are lexically marked to trigger a rule which transfers stress one syllable to the right.

In addition, I posited a rule of Retraction which moves stress one syllable to the left. A small set of root morphemes is lexically marked to trigger this rule.

1.3 Vowel-Zero Alternations, Null Inflections, and the Yers

Certain case forms appear to have no inflectional morpheme. These forms include the nom and acc sg of m nouns, the gen plural of n and f_a nouns, and the nom and acc sg of f_b nouns.¹⁵

Consider what happens to stress in these forms when the noun has an unaccented root. Examples of nouns with a null inflection in the gen pl are shown in (15).

(15) Stress in Case Forms with a Null Inflection

(i) borodá (f) 'beard' Root: [borod] (Class C)

	SG	PL
NOM	borod+á	bórod+y
GEN	borod+ŷ	boród+φ

(ii) zérkalo (n) 'mirror' Root: [zerkal] (Class C)

	SG	PL
NOM	zérkal+o	zerkal+á
GEN	zérkal+a	zerkál+φ

In each case, stress falls on the final syllable of the root. This is not what we predict, however. For if we assume that a null inflection has no phonological content at any level of representation, then the default clause of the BAP should assign stress to the initial vowel in words with unaccented roots.

We can account for stress in the gen pl forms of these nouns if we assume that the inflection is an underlying vowel of some type and that it is accented. If the root is unaccented, the BAP assigns stress to the accented vowel of the inflection. A later rule deletes the inflectional vowel (under conditions which will be discussed below), and stress moves to the left.

There is independent evidence to support the claim that these null nominal inflections are underlyingly vowels. Numerous words in Russian exhibit vowel-zero alternations. Consider, for example, the forms in (16).

(16) Vowel-Zero Alternations

NOM SG: botinok+ ϕ (m) 'boot'

GEN SG: botin ϕ k+a

GEN PL: kukol+ ϕ (f) 'doll'

NOM SG: kuk ϕ l+a

GEN PL: sosen+ ϕ (f) 'pine tree'

NOM SG: sos ϕ n+a

NOM SG: veter+ ϕ (m) 'wind'

GEN SG: vet ϕ r+a

Where alternations occur in the examples above, the vowel surfaces before a null inflection. The vowels involved are e and o.

Let us assume for the time being that Russian has six underlying vowels. These are given in (17).

(17) Underlying Vowel Inventory of Russian

	i	u	y	e	o	a
high	+	+	+	-	-	-
low	-	-	-	-	-	+
back	-	+	+	-	+	+
round	-	+	-	-	+	-

There is no phonological basis for predicting the occurrence of vowel-zero alternations in Russian. One can find numerous minimal or near-minimal pairs of words, in which one member exhibits the alternation and the other does not. Examples involving both nouns and adjectives are given in (18).

(18) Minimal or Near-Minimal Pairs

(i)	dolga (N) (gen sg)	dolg (nom sg)	'debt'
	dolga (ADJ) (f)	dolog (m)	'long'
(ii)	laska (N) (nom sg)	lask (gen pl)	'caress'
	laska (N) (nom sg)	lasok (gen pl)	'weasel'
(iii)	xrabra (ADJ) (f)	xrabr (m)	'brave'
	šabra (N) (gen sg)	šabër (gen sg)	(dial.) 'neighbor'

(iv)	Marka (N) (gen sg)	Mark (nom sg)	'Mark'
	marka (ADJ) (f)	marok (m)	'easily soiled'
(v)	nagla (ADJ) (f)	nagl (m)	'impudent'
	tjagla (N) (gen sg)	tjagol (gen pl)	'tax'
(vi)	svëkla (N) (nom sg)	svëkl (gen pl)	'beet'
	stekla (N) (gen sg)	stëkol (gen pl)	'glass'
(vii)	serna (N) (nom sg)	sern (gen pl)	(zool.)
			'chamois'
	zerna (N) (gen sg)	zeren (gen pl)	'grain'

These data show that vowel-zero alternations in Russian cannot be the result of epenthesis.¹⁶

We are thus led to conclude that there is some underlying distinction between those mid vowels which exhibit this alternation and those which do not, the distinction being neutralized in surface representations. In other words, we must posit a pair of vowels which belong to the underlying inventory of the language, but which surface as e or o.

Historically, Slavic had a pair of high lax vowels. These vowels, called yers, never surface in contemporary Slavic. Lightner (1965, 1972) was the first to argue that yers are part of the underlying structure of contemporary Slavic. His analysis distinguishes these vowels from the high front vowels i and u by the feature [-tense] and includes a synchronic rule known as Lower, which vocalizes a yer before a yer in the following syllable. The rule is given in (19).

(19) Rule of Lower

$$\begin{bmatrix} +hi \\ -tns \end{bmatrix} \rightarrow [-hi] / ______ C_o \begin{bmatrix} +hi \\ -tns \end{bmatrix}$$

Pesetsky (1979) showed that the Lowering rule applies cyclically, while a post-cyclic rule deletes nonlowered yers (i.e. vowels with the features [+hi, -tns]).

Let us assume that the null nominal inflections (i.e. nom and acc sg and gen pl) are yers and that nouns exhibiting vowel-zero alternations contain a yer in the underlying representation of the stem. Given the rule of Lower, we can account for the fact that a yer in the final syllable of a nominal stem will vocalize (i.e. as e or o) only in the nom sg and gen pl. We also correctly predict that the nom sg and gen pl inflections will always be null, since inflectional yers will always fail to meet the conditions for the Lower rule.

Lightner's analysis makes a further prediction. If a sequence of yers occurs within the stem, all except the stem-final yer will undergo Lowering (i.e. vocalize) in all forms of the inflectional paradigm. This is verified by the examples in (20). In each set, the diminutive suffix (e)k, which contains a yer, is added to a stem which likewise has a yer.¹⁷

(20) Nouns Containing a Sequence of Yers Within the Stem

	<u>NOM SG</u>	<u>GEN SG</u>	
(i)	dubók dubóček	dúbka dubóčka	'oakling' 'tiny oakling' ¹⁸
(ii)	úzel uzelók uzelóček	uzlá uzelká uzelóčka	'knot' 'little knot' 'tiny little knot'

Derivations of the nom sg and gen sg of uzeloček 'tiny little knot' are shown below. Hereafter, I will use capital E and O to distinguish underlying front and back yers from the vowels e and o. A rule of Velar Palatalization (Vel Pal) applies in the forms shown. This rule changes a velar consonant into a strident palatal (i.e. k->č, g->ž, x->š) before a front vowel or glide.¹⁹

(21) Derivations

(i) <u>uzelóček</u> (nom sg)		(ii) <u>uzelóčka</u> (gen sg)	
<u>CYCLE 2</u>	[[uzE1] Ek]	<u>CYCLE 2</u>	[[uzE1] Ek]
Lower	e	Lower	e
<u>CYCLE 3</u>	[[uzelEk] Ek]	<u>CYCLE 3</u>	[[uzelEk] Ek]
Lower	e	Lower	e
Vel Pal	č	Vel Pal	č
<u>CYCLE 4</u>	[[uzelečEk] O]	<u>CYCLE 4</u>	[[uzelečEk] a]
Lower	e	Lower	----
<u>POST-CYCLIC</u>	[uzelečekO]	<u>POST-CYCLIC</u>	[uzelečEka]
O/E->φ	φ	O/E->φ	φ

Lightner's analysis crucially relies on segmental features to distinguish between the abstract vowels E and O and the vowels i and u in underlying forms. In the next chapter, I will show that this analysis fails to account for the metrical behavior of these vowels, and consequently I will propose a different treatment of the yers. However, until we encounter the data which bear on this issue, there is no harm in simply following Lightner and assuming that there are two [+hi, -tns] vowels in the underlying inventory of Russian. One of these is [-back] and surfaces as e and the other is [+back] and surfaces as o. I will continue to transcribe underlying yers by capital letters E and O. Where a yer has deleted in the surface representation, I will use the symbol ϕ . I will assume that the rule of Lower is cyclic, while Yer-Deletion ([+hi, -tns] $\rightarrow \phi$) is post-cyclic.

Returning now to the question of null inflections, let us assume that the nom and acc sg and gen pl null inflections are underlying yers. We have seen that the yer representing the gen pl inflection is accented (see the examples in (15)). However, this is not true of the yer representing the nom sg. M nouns with unaccented roots have stress on the initial vowel in the nom sg, rather than on the final vowel of the root.

An example is given in (22). The fact that stress alternates between the initial and final vowel shows that the root is unaccented. The fact that stress falls on the initial vowel in the nom sg shows that

the underlying yer in this inflectional suffix is unaccented. If it were accented, stress would fall on the final vowel of the root.²⁰

(22) Evidence that the Yer in the Nom Sg Inflection is Unaccented

vólos (m) 'hair'
Root: Class C

	SG	PL
NOM	vólos	vólos+y
GEN	vólos+a	volos+óv
DAT	vólos+u	volos+ám

Derivations illustrating stress assignment in forms in which the inflectional suffix is a yer are given in (23). Both examples involve nouns with unaccented roots.

(23) Derivations

(i) zerkál (n) (gen pl)
'mirror'

Root: [zerkal] (-acc)
Infl: [0] (+acc)

CYCLE 2 [[zerkal] 0]
BAP [[zerkal] ɔ]
LOWER n.a.

POST-CYCLIC [zerkalɔ]

E/O->ϕ ϕ

zerkál

(ii) vólos (m) (nom sg)
'hair'

Root: [volos] (-acc)
Infl: [0] (-acc)

CYCLE 2 [[vclos] 0]
BAP [[vólos] 0]
LOWER n.a.

POST-CYCLIC [vólos0]

E/O->ϕ ϕ

vólos

1.4 Formal Representation of Stress

We have examined thus far the stress properties of nonderived nouns. Based on those data, I have argued that the stress system of Russian involves an interaction between lexically-determined accentual properties of morphemes and a rule which assigns stress to the leftmost accented vowel or to the leftmost vowel in forms which have no accent. In the derivations presented above, I identified accented vowels with an asterisk and simply showed the BAP assigning a stress to the leftmost accented vowel. That was, in fact, little more than a descriptive device to illustrate the basic system. Having laid the foundation of my analysis, I will now turn to the problem of formalizing the system of stress.

I begin by assuming a version of autosegmental phonology in which phonological representations are three-dimensional structures consisting of intersecting half-planes. Following Levin (1985), I assume that these half-planes intersect in a sequence of timing slots (the skeleton), whose phonetic content is specified on a separate autosegmental plane. Following Halle and Vergnaud (1987) (hereafter HV), I will posit a separate autosegmental plane for representing stress.²¹ In addition to the stress plane, for the purposes of the analysis presented here I will also posit autosegmental planes for segmental features and syllable structure.

The stress plane contains a metrical grid. All stressable elements are represented on this plane by a sequence of asterisks which constitute the bottom line (Line 0) of the grid. Since only vowels are stressable elements in Russian, only vowels are represented on the stress plane.

An accent is formally represented as a Line 1 asterisk in the grid. Formal representations of accented and unaccented morphemes are given in (24).

(24) Formal Representations of Accented and Unaccented Morphemes

	(i) -accented	(ii) +accented
	L1	L1 *
STRESS PLANE	L0 * *	L0 * *
SKELETON	[XXXXX]	[XXXXX]
SEGMENTAL PLANE	CVCVC	CVCVC

A theory of stress must account for the fact that deletion of a stressed vowel does not entail deletion of stress. Instead, vowel deletion typically results in movement of stress to an adjacent vowel. We have already seen evidence of this in Russian. To account for this, I will follow HV in assuming that sequences in the metrical grid are hierarchically organized into metrical constituents. Each constituent contains one metrically prominent element which functions as head.²² A head is designated as an element with a Line 1 asterisk.

HV argue that two binary parameters define the set of possible metrical constituents. The parameters are the following:

1. Whether or not the head of the constituent is adjacent to one of the constituent boundaries ([\pm Head Terminal (HT)])
2. Whether or not the head of the constituent is separated from its constituent boundaries by no more than one intervening element ([\pm Bounded (BND)])

In addition, languages with [+Head Terminal] constituents must specify the location of the head (i.e. constituents are either right-headed or left-headed.) In languages with right-headed feet (i.e. right-headed Line 0 constituents), deletion of a stressed vowel will result in the stress moving to the left; in languages with left-headed feet, stress will move to the right.

I will assume that in Russian, Line 0 metrical constituents are unbounded, head-terminal, and right-headed. This will account for the accent moving to the left when an accented vowel deletes.²³

In Russian stress falls on the leftmost accented vowel.²⁴ This is captured by the rule which has traditionally been referred to as the Basic Accentuation Principle (BAP). In the derivations of nominal stress in Section 1.2, I simply showed the BAP assigning stress to the leftmost accented vowel or to the leftmost vowel if the word contained no accented vowel. However, in the formal framework which I am adopting

here, the BAP is not itself a rule but rather is a description of two distinct metrical rules. One rule assigns a Line 1 asterisk to the initial vowel if there is no accented vowel. Another constructs an unbounded, left-headed constituent on Line 1. These rules together ensure that stress will fall on the leftmost accented vowel, or if there is no accented vowel, stress will fall on the initial vowel. Foot construction (i.e. construction of unbounded, right-headed constituents on Line 0) is an independent process, determined by the parameter settings [-BND, +HT, R-Headed].²⁵

Although Russian words may contain two or more accented morphemes, they surface with only one stress. Therefore, we must incorporate some kind of formal mechanism for suppressing all but the leftmost constituent on Line 0. I will adopt the HV convention of line conflation in the metrical grid. Modifying their proposal somewhat, I will assume that conflation completely eliminates Line 2 and preserves only the head element on Line 1. A constituent on Line 0 is preserved only if its head is preserved. Thus, conflation results in the elimination of all but the leftmost metrical constituent on Line 0.

To summarize the discussion thus far, I have assumed that stress is represented by means of a grid in which sequences of elements are organized into hierarchical constituents. The bottom line of the grid (Line 0) consists of a sequence of elements representing the stressable elements in a word. In Russian, only vowels are stressable elements.

Elements on Line 1 represent the heads of Line 0 constituents (a foot), while elements on Line 2 represent the heads of Line 1 constituents. There are two parameters which determine the set of possible types of constituents: (i) [\pm Bounded] and (ii) [\pm Head Terminal]. Languages which have [+HT] constituents must specify the location of the head. In Russian, Line 0 constituents are [-BND], [+HT], and [Right-Headed]. Line 1 constituents are [-BND], [+HT], and [Left-Headed].

The rules which are needed to account for stress assignment in Russian are given below.

(25) Metrical Rules for Russian

MR_a: Assign a Line 1 asterisk to all accented vowels; if there is no accented vowel, assign a Line 1 asterisk to the initial vowel

MR_b: Construct constituent boundaries on L0.

MR_c: Construct constituent boundaries on Line 1 and locate the head of Line 1 on Line 2.

MR_d: Conflate Lines 1 and 2

Hereafter I will simply use the term BAP to refer to this set of rules.

To illustrate how these rules assign stress, in (26) I present a derivation of a hypothetical form consisting of two accented morphemes. In the underlying representation, I will identify an accented vowel by underlining the X-slot associated with this vowel.

(26) Derivation

(i) Underlying Representation

```

L0      *      *      *          *      *
        |      |      |          |      |
        |      |      |          |      |
[[X X X X X X X] X X X X]
        |      |      |          |      |
        C V C V C V C      C V C V

```

(ii) (MR_a): assign a Line 1 asterisk to all lexically accented vowels

```

L1              *              *
L0      *      *      *          *      *
        |      |      |          |      |
        |      |      |          |      |
[[X X X X X X X] X X X X]
        |      |      |          |      |
        C V C V C V C      C V C V

```

(iii) (MR_b): construct constituent boundaries on Line 0
(Line 0 constituents are [-BND, +HT, R-Headed])

```

L1              *              *
L0      (*      *) (*          *      *)
        |      |      |          |      |
        |      |      |          |      |
[[X X X X X X X] X X X X]
        |      |      |          |      |
        C V C V C V C      C V C V

```

(iv) (MR_c): construct constituent boundaries on Line 1 and mark the
head on Line 2
(Line 1 constituents are [-BND, +HT, L-Headed])

```

L2              *
L1      (*          *)
L0      (*      *) (*          *      *)
        |      |      |          |      |
        |      |      |          |      |
[[X X X X X X X] X X X X]
        |      |      |          |      |
        C V C V C V C      C V C V

```

(v) (MR_d): conflate Lines 1 and 2

$$\begin{array}{ccccccc}
 L1 & & & * \\
 L0 & (* & *) & * & & * & * \\
 & | & | & | & & | & | \\
 [X & X & X & X & X & X & X] & X & X & X & X \\
 | & | & | & | & | & | & | & | & | & | & | \\
 C & V & C & V & C & V & C & C & V & C & V
 \end{array}$$

In the derivation above, two metrical constituents are constructed on Line 0, due to the presence of two lexically accented vowels. Furthermore, metrical structure is imposed on the entire string, since the rightmost accented vowel is at the edge of the word.

Let us consider a different case, namely one in which there is only one accented vowel, and this vowel is not located at the right edge of the word. Given the set of metrical rules which I have posited for Russian, it is not clear whether more than one metrical constituent will be constructed in this instance. There are two possibilities. One is that the foot-construction rule (MR_b) applies only where metrically prominent vowels are pre-determined by the lexicon (i.e. lexically accented vowels). The other possibility is that the rule applies exhaustively. In the latter case, even if the final vowel of the sequence is not lexically accented, an unbounded, right-headed foot is constructed at the right edge of the word, and the final vowel becomes the head of that constituent. Each possibility is illustrated below in derivations involving a form with one accented vowel.

(27) Noniterative Foot Construction

(i) Underlying Representation

```

L0      *      *      *          *      *
      |      |      |          |      |
    [[X X X X X X X] X X X X]
      | | | | | | |      | | | |
      C V C V C V C      C V C V
  
```

(ii) MR_a: assign a Line 1 asterisk to each accented vowel

```

L1          *
L0      *      *      *          *      *
      |      |      |          |      |
    [[X X X X X X X] X X X X]
      | | | | | | |      | | | |
      C V C V C V C      C V C V
  
```

(iii) MR_b: construct constituent boundaries on Line 0

```

L1          *
L0 (*      *) *          *      *
      |      |      |          |      |
    [[X X X X X X X] X X X X]
      | | | | | | |      | | | |
      C V C V C V C      C V C V
  
```

(iv) MR_c: construct constituent boundaries on Line 1 and mark the head on Line 2

```

L2          *
L1      (*)
L0 (*      *) *          *      *
      |      |      |          |      |
    [[X X X X X X X] X X X X]
      | | | | | | |      | | | |
      C V C V C V C      C V C V
  
```

(v) MR_d: conflate Lines 1 and 2

```

L1          *
L0 (*      *) *          *      *
      |      |      |          |      |
    [[X X X X X X X] X X X X]
      | | | | | | |      | | | |
      C V C V C V C      C V C V
  
```


(28) Iterative Foot Construction

(i) Underlying Representation

```

[[X X X X X X X] X X X X]
 | | | | | | | | | |
 C V C V C V C C V C V

```

(ii) MR_a: assign a Line 1 asterisk to each accented vowel

```

L1      *
L0  *    *    *      *    *
    |    |    |      |    |
[[X X X X X X X] X X X X]
 | | | | | | | | | |
 C V C V C V C C V C V

```

(iii) MR_b: construct constituent boundaries on Line 0 and (where necessary) mark the heads on Line 1

```

L1      *      *
L0  (*  *) (*      *  *)
    |    |    |      |    |
[[X X X X X X X] X X X X]
 | | | | | | | | | |
 C V C V C V C C V C V

```

(iv) MR_c: construct constituent boundaries on Line 1 and mark the head on Line 2

```

L2      *
L1      (*      *)
L0  (*  *) (*      *  *)
    |    |    |      |    |
[[X X X X X X X] X X X X]
 | | | | | | | | | |
 C V C V C V C C V C V

```

(v) MR_d: conflate Lines 1 and 2

```

L1      *
L0  (*  *) *      *    *
    |    |    |      |    |
[[X X X X X X X] X X X X]
 | | | | | | | | | |
 C V C V C V C C V C V

```

Clearly, either assumption will result in the correct assignment of stress to the only accented vowel in the word. Thus, there is no empirical motivation in Russian for imposing metrical structure on a sequence of vowels which do not fall within the domain of a lexically accented vowel.

However, HV incorporated into their framework a condition requiring that metrical structure be constructed over the entire string (their Exhaustivity Condition). In their view, all footing rules are iterative. Others have argued that this condition is language-specific and have proposed instead a parameter [\pm Iterative] (see, for example, Hayes (1981, 1987) and Levin (1989)). They propose that in languages with multiple stresses, the parameter is set to plus, while in languages with one stress, the parameter is set to minus. Thus, there are two alternative proposals: (i) the Exhaustivity Condition supplemented by the rule of conflation and (ii) a parameter [\pm Iterative].

Halle (1989) has shown that there are languages in which words typically have a single stressed syllable, but for which a [-Iterative] setting of the parameter fails to account for stress assignment. One example is Cairene Arabic. The facts of Cairene stress are given in (29) (these are from McCarthy (1979), cited by Halle (1989, 8)).

(29) Cairene Stress

- a. If the last syllable of the word is super-heavy, it is stressed, otherwise
- b. If the penultimate syllable is heavy, it is stressed, otherwise
- c. Stress goes on the antepenult or the penult, depending on which of the two is separated by $2n$ (an even number or zero) syllables from the preceding heavy syllable or--in the absence of such a syllable--from the beginning of the word.

If neither conditions (a) nor (b) are met, then in order to assign stress, one has to count the number of syllables between the antepenultimate syllable and either a preceding heavy syllable or the beginning of the word. The only mechanism for determining whether an element is odd or even is binary foot construction. And this will only work if foot construction is iterative. Thus, in Cairene Arabic foot construction must apply iteratively even though words have only one stress.

In light of these facts, I will assume the Exhaustivity Condition on foot construction. In Russian this means that any elements on the right edge of the word which do not fall within the domain of an accented vowel are incorporated into an unbounded foot. Given that Line 0 constituents are right-headed in Russian, a Line 1 asterisk will be assigned to the final vowel to mark it as the head. This was illustrated in (28).

1.5 Dominance, Cyclicity, and Stress Assignment in Derived Nouns

1.5.1 Introduction

In this section I will extend my analysis to derived nouns. I will point out an important correlation between the derivational status of nouns and stress, and show that this correlation is explained by making two additional assumptions. The assumptions are the following: (i) the BAP is a cyclic rule and (ii) all suffixes in Russian are cyclic.

We will see that suffixes actually fall into four distinct accentual classes, rather than two. Independent of their accentual status (i.e. [\pm accented]), suffixes may have the additional property that they wipe out any accent on the stem to which they attach. This property I will refer to as dominance (following Halle and Kiparsky (1977) and Halle and Vergnaud (1985)).

1.5.2 The Nonderived Noun Generalization

At this point I want to introduce an observation that is crucial to the present analysis, and which provides the empirical basis for one of the main theoretical claims that I want to make. The generalization is the following: **only nonderived nouns have mobile stress.**²⁶

(30) Nonderived Noun Generalization

Mobile stress occurs only in nonderived nouns (i.e. nouns consisting of only a root and an inflection).

In other words, a pattern in which stress alternates between the inflection and the initial vowel does not occur in nouns which contain a derivational suffix.

In Sect. 1.2.3 I argued that nouns with mobile stress have unaccented roots. If the inflection is accented, it gets stress. If the inflection is unaccented, stress ends up on the initial vowel due to the default clause of the BAP (i.e. by MR_a, a Line 1 asterisk is assigned to the initial vowel if there is no lexically accented vowel in the word).

From the fact that mobile stress occurs, we know that the BAP does not apply on the first cycle. If it did, a root morpheme would never enter the inflectional cycle without an accent and consequently stress would always end up on the stem. However, the data in Sect. 1.2.1 do not provide a basis for determining whether the BAP applies cyclically or post-cyclically. Since those forms included only a root and inflection, either assumption produces the correct result.

The absence of mobile stress in derived forms means that stems consisting of more than one morpheme are always accented. There are two possible explanations for this fact. One is that all derivational suffixes are accented. The other explanation involves three assumptions,

(i) there are both accented and unaccented derivational suffixes; (ii) the stress rule applies cyclically; and (iii) all suffixes are cyclic. The second hypothesis predicts that if a root and derivational suffix are both unaccented, the default clause of the BAP will apply on the second cycle, assigning an accent to the initial vowel. Since stress falls on the leftmost accented vowel, the accentual property of the inflection would have no effect on stress assignment in derived forms. I will show that it is the second hypothesis which explains the Nonderived Noun Generalization.

1.5.3 [-Accented, -Dominant] Derivational Suffixes

Let us begin by considering the crucial case of derived nouns whose stems contain only unaccented morphemes. Unlike their nonderived counterparts (i.e. the Class C nouns presented in Section 1.2.1), these words have fixed stress, with stress falling on the initial vowel throughout the inflectional paradigm.

Because some of the data involve adjectival stems, I need to digress very briefly before presenting these examples and give some background about adjectival stress.

Many adjectives have both a long and short form, depending on the type of inflection involved. Short form adjectives show simple gender or number agreement. The short form inflections are the following: ϕ (m sg); o (n sg); a (f sg); y (pl). The m sg inflection is

underlyingly a [+back] yer (o). Long form adjectives are fully declined for gender, number, and case.²⁷ In this discussion, it is only the short form type that concerns us.

Nonderived short form adjectives exhibit three of the four major stress patterns seen in the nouns. These include: fixed stress on the stem, fixed stress on the inflection, and mobile stress. I will refer to these as Classes A, B, and C, respectively. In the Class C (mobile stress) paradigm of short form adjectives, stress falls on the inflection in the feminine, and on the initial vowel in the remaining forms. (The m agreement suffix is o). An example is given below.

(31) Mobile Stress in Short Form Adjectives

M: mólod+φ 'young'
N: mólod+o
F: molod+á
PL: mólod+y

Clearly this pattern suggests that the f agreement suffix (a) is accented, while the others are unaccented. Thus, the diagnostic test for an unaccented adjectival stem is mobile stress.²⁸

Now consider the data in (32). These are nouns derived from the unaccented suffix ost. This very productive suffix attaches to adjectival stems, creating f nouns which mean 'having the quality x', where "x" is the quality referred to by the adjectival stem. I include in the examples both the surface form and a simplified version of the underlying form (indicating an accented vowel simply by placing an

asterisk over it). The pl and f forms of the corresponding short form adjective are presented first, to demonstrate the accentual property of the root. Note that these nouns belong to the f₆ declension (see Section 1.2.2).

(32) Nouns Derived with a [-Accented, -Dominant] Suffix

(i) SHORT FORM ADJECTIVE:

gorbát+a, gorbát+y (A) 'humpbacked'

DERIVED NOUN:

(a) gorbátost+i (gen sg) 'condition of being humpbacked'

*

UR: [[[gorbat] ost] i]

(b) gorbátost+am (dat pl)

* *

UR: [[[gorbat] ost] am]

(ii) SHORT FORM ADJECTIVE:

molod+á, mólod+y (C) 'young'

DERIVED NOUN:

(a) mólodost+i (gen sg) 'youth'

UR: [[[molod] ost] i]

(b) mólodost+am (dat pl)

*

UR: [[[molod] ost] am]

Example (i) is trivial. The root is accented. That being the leftmost accent, it will get stress in all forms of the inflectional paradigm.

Example (ii) is what interests us. Here the root is unaccented, as shown by the stress shift in the short form adjective. The fact that stress does not fall on the suffix ost tells us that it is likewise unaccented. Now consider first the gen sg form mólodosti. We know from the stress patterns of nonderived nouns that the gen sg inflection is unaccented. Therefore, we predict that the default clause of the BAP will assign stress to the initial vowel in the form molodosti. Notice that in this case, the BAP could be applying either on the second cycle or post-cyclically and the result would be the same.

But now consider the dat pl form. In this case, the inflection is accented. Nevertheless, even though it is the only accented morpheme in the word, stress does not fall on the inflection. Instead, the word behaves like a form containing no accented morpheme, with stress assigned to the initial vowel.

We have already established that the BAP does not apply on the first cycle. Given this fact, what the dat pl form in (30(ii)) shows is the following:

1. In derived forms (i.e. those containing more than two morphemes), the BAP applies on the second cycle. Thus, the BAP is a cyclic rule.
2. The BAP does not apply on the first cycle. Therefore, it is subject to the Strict Cycle Condition.
3. The suffix ost, which is [-accented, -dominant], triggers the BAP on Cycle 2. This means that ost is a cyclic suffix. This shows that the property of dominance cannot be reduced to cyclicity, and explains why derived nouns like mólodost have fixed stress.

Other examples of nouns derived from unaccented roots with this suffix include: grúbost' (adj: grubá, grúby) 'coarseness'; strógost' (adj: strogá, strógi) 'strictness'; glúpost' (adj: glupá, glúpy) 'stupidity'; and skórost' (adj: skorá, skóry) 'speed'.

In (33) I give derivations of the gen sg and dat pl of mólodost'.

Before presenting the derivations, however, it will be helpful to review the formal system of stress assignment. Recall that I have adopted the following set of metrical rules:

1. MR_a : assign a Line 1 asterisk to all lexically accented vowels;
if there is no accent, assign one to the initial vowel.
2. MR_b : construct unbounded, right-headed constituents on Line 0
and (where necessary) mark the head on Line 1.
3. MR_c : construct unbounded, left-headed constituents on Line 1,
and mark the head on Line 2.
4. MR_d : conflate Lines 1 and 2

I assume that footing (i.e. construction of Line 0 constituents) is iterative, applying across the entire string. All of these rules apply cyclically, in the order indicated. For convenience, I will continue to refer to these rules as the BAP.²⁹

(33) Stress Assignment in a Derived Noun with No Accented Morpheme in the Stem

L0 * *
 | |
CYCLE 1 {XXXXX}
 |||||
 molod

BAP SCC

L0 * * *
 | | |
CYCLE 2 {[XXXXX] XXX}
 ||||| |||
 molod ost

BAP

L2 *
 L1 (* *)
 L0 (*|* *)
 | | |
 {[XXXXX] XXX}
 ||||| |||
 molod ost

CONFLATION

L1 *
 L0 (*)* *
 | | |
 {[XXXXX] XXX}
 ||||| |||
 molod ost

L1 *
 L0 (*)* * *
 | | | |
CYCLE 3 {[XXXXXXXXX] X}
 ||||| |||
 molodost i

L2 *
 L1 (* *)
 L0 (*|* * *)
 | | | |
 BAP {[XXXXXXXXX] X}
 ||||| |||
 molodost i

L0 * *
 | |
CYCLE 1 {XXXXX}
 |||||
 molod

BAP SCC

L0 * * *
 | | |
CYCLE 2 {[XXXXX] XXX}
 ||||| |||
 molod ost

BAP

L2 *
 L1 (* *)
 L0 (*|* *)
 | | |
 {[XXXXX] XXX}
 ||||| |||
 molod ost

CONFLATION

L1 *
 L0 (*)* *
 | | |
 {[XXXXX] XXX}
 ||||| |||
 molod ost

L1 * *
 L0 (*)* * *
 | | | |
CYCLE 3 {[XXXXXXXXX] XX}
 ||||| |||
 molodost am

L2 *
 L1 (* *)
 L0 (*|* * *)
 | | | |
 BAP {[XXXXXXXXX] XX}
 ||||| |||
 molodost am

CONFLATION

L1	*		
L0	(*)	*	*
	[XXXXXXXX]		X]
	molodost		i

mólodosti (gen sg)

CONFLATION

L1	*		
L0	(*)	*	*
	[XXXXXXXX]		XX]
	molodost		am

mólodostam (dat pl)

In these forms, there is no lexically accented vowel on the second cycle (i.e. the stem is unaccented). Therefore, the default clause of the BAP (technically it is MR₁) assigns a Line 1 asterisk to the initial vowel. The final vowel in this form is assigned a Line 1 asterisk as well, due to the Exhaustivity Condition on foot construction and the fact that feet are unbounded and right-headed in Russian. However, Conflation eliminates all but the first constituent.

Another [-accented, -dominant] suffix is nik, which attaches to nominal stems and forms masculine nouns. This suffix actually has two allomorphs: one which is [-accented, -dominant] and the other which is [+accented, +dominant]. The accentual difference correlates to some extent with a difference in meaning. The former generally derives nouns referring to a person, while the latter often refers to a type of object. It is the [-accented, -dominant] form that is relevant to this discussion.

Examples are given in (34). Again, I include the related nonderived noun, noting the accentual class of the stem. Observe that all the derived forms belong to Class A, which means that they have

fixed stress on the stem. Notice as well that post-accenting roots (Class B) do not transfer the accent to the stem suffix in the derived forms.³⁰

(34) Nouns Derived with the [-Accented, -Dominant] Suffix nik

<u>BASE NOUN</u>		<u>DERIVED NOUN</u>
jábeda (f) (A) 'slander'	---->	jábednik (m) (A) 'informer'
póst (m) (B) 'fasting'	---->	póstnik (m) (A) 'faster'
láger' (m) (C) 'camp'	---->	lágernik (m) (A) 'camp inmate'
pójezd (m) (C) 'train'	---->	pójezdnik (m) (A) 'commuter'
léto (n) (C) 'summer'	---->	létnik (m) (A) 'annual plant'
vodá (f) (C) 'water'	---->	vódnik (m) (A) 'water transport worker'

1.5.3.1 Dominance, Cyclicity and the Nonderived Noun Generalization

Vedic Sanskrit and Lithuanian have stress systems which are closely related to that of Russian. Based on data from these languages, Halle and Mohanan (1985) argue that distinctions between stress-sensitive and stress-neutral suffixes (e.g. in English) and between dominant and recessive suffixes (e.g. in Sanskrit and Lithuanian) is one of cyclicity. They argue that stress-sensitive and dominant suffixes are cyclic, while stress-neutral and recessive suffixes are noncyclic.

Halle and Vergnaud (1987) interpret this formally in the following way:

1. cyclic morphemes are affixed on a plane distinct from that of the stem, whereas noncyclic morphemes are affixed on the same plane as the stem;
2. cyclic affixation is accompanied by a process of copying the content of the stem onto the plane of the affix, leaving the content of the stem plane intact;
3. however, not all information available in the plane is copied;
4. in particular, information contained in the metrical grid is not copied.

Halle and Kenstowicz (1989) propose that cyclic affixes trigger a convention of universal grammar which deletes stresses assigned on earlier passes through the rules of the cyclic block.

In the previous section I presented two examples of unaccented, recessive suffixes (ost and nik). We can establish that they are not accent-deleting by the fact that an accented root retains its accent in the presence of these suffixes. Nevertheless, both clearly exhibit the properties of cyclic suffixes, since they trigger application of the BAP. This is most clearly illustrated by the dat pl example in (33), where it was shown that stress falls on the initial vowel of the word, even when the inflection is lexically accented. This shows that the reduction of dominance to cyclicity cannot be maintained as a general principle.

We can now explain why mobile stress is confined to nonderived forms in Russian (i.e. the Nonderived Noun Generalization). If all suffixes are cyclic, then in a word containing at least one derivational suffix, the stem can never enter the inflectional cycle without an accent already having been assigned by the BAP. And given the "leftmost accent wins" clause of the BAP, a stem accent will always prevail over an accent on the inflection.³¹

1.5.3.2 Level-Ordering and the Relation between Morphological and Phonological Processes

There remains the problem of how to represent the distinction between dominant and recessive suffixes. An observation that potentially bears on this question is that dominant suffixes in Russian always precede recessive suffixes.³² One possibility, therefore, is to assume a level-ordered morphology, and posit a rule of Accent Deletion which is restricted to Level I.

The idea of level-ordered morphology was first proposed by Siegel (1974) and Allen (1978). Their hypothesis was that word-formation rules are partitioned into two blocks or levels, which are ordered with respect to each other. This ordering defines the ordering of morphological processes. A further claim was that phonological rules fall into two classes, cyclic and noncyclic. Level I affixation precedes application of cyclic phonological rules, while Level II affixation

follows application of cyclic rules. For example, Siegel argued that Level I affixes in English are stress-sensitive, while Level II affixes are stress neutral. Her model captures this by assigning the stress rule to Level I.

The theory of Lexical Phonology has its origins in Pesetsky's (1979) study of Russian, in which he proposes certain revisions in Siegel's and Allen's model of the relation between morphology and phonology. While maintaining that the lexicon is organized into levels, with each level defined by a set of affixes and the phonological rules which apply to them, Pesetsky argued that certain phonological rules belong to the word-formation component of the grammar, applying in the lexicon after each word-formation process. Thus, according to his model, the output of each word-formation process is input to the phonology. He also incorporates the Strict Cycle Condition into the theory by ordering Bracket Erasure at the end of each cycle. In this way, the distinction between material that is first available on a given cycle and material introduced on an earlier cycle is maintained throughout the cycle, but is eliminated before the next cycle.

Both Pesetsky's model, as well as that of Allen and Siegel, predict that all affixes which trigger Level I phonological rules will occur to the left of those which trigger Level II phonological rules. Pesetsky's model crucially differs in that it derives cyclicity. Cyclic rule application is a consequence of where in the grammar a phonological

rule applies: rules which apply in the lexicon are necessarily cyclic, whereas those which apply after word-formation are necessarily noncyclic (given the Bracket Erasure Convention).

The theory of Lexical Phonology has been modified and developed in various ways in work by Mohanan (1982), Kiparsky (1982a&b), Pulleyblank (1983), Rubach (1984), and Halle and Mohanan (1985), among others. In particular, the view that word-formation rules are interleaved among rules of the word phonology, has been challenged in recent work by Halle and Vergnaud (1987) and Halle and Kenstowicz (1989). Among the evidence they they bring to bear on this issue are counterexamples to Siegel's claim that the distinction between stress neutral and stress-sensitive suffixes in English is captured by ordering of affixation processes in relation to the stress rule. These counterexamples, first noted by Aronoff (1976), involve words in which a stress-neutral suffix precedes one which is stress-sensitive (e.g. *pátentable* - *patentability* and *développement* - *developmental*).

In light of these and other data, both Halle and Vergnaud and Halle and Kenstowicz propose to eliminate the interleaving of these two components, while at the same time preserving the organization of the phonology into distinct blocks of cyclic and noncyclic rules. They argue that the set of phonological rules which an affix triggers (i.e. cyclic or noncyclic) cannot be predicted from any other property of that morpheme, and thus it must be supplied by a diacritic feature.

Consequently, affixes which do not trigger cyclic rules may precede those which do. Their theory implies that cyclicity is a property both of individual morphemes and of blocks or strata of phonological rules.³³

Let us assume that phonological rules are organized into two blocks, cyclic and noncyclic. In Russian, all suffixes are cyclic. Nevertheless, suffixes do fall into two distinct classes, depending upon whether they eliminate or preserve accents of the stem to which they attach.

To capture the distinction between dominant and recessive suffixes, we can revise the formal approach of Halle and Vergnaud. Let us assume that dominance is an arbitrary property of a suffix, which is supplied by a lexical feature and interpreted in the following way: dominant suffixes are affixed on a plane distinct from the stem, while nondominant suffixes are not. Affixation of a dominant suffix is accompanied by copying the content of the stem except for metrical information. Nondominant suffixes are represented on the same plane as the stem. No further distinction is made. The BAP, as well as all other cyclic rules, apply freely to all suffixes.³⁴

Although the data of Russian are consistent with the standard version of Lexical Phonology in which the output of word-formation rules is input to the phonology, in light of the problems raised by the English examples I will assume that phonological rules apply after the morphology.

1.5.3.3 Stress Assignment and the Strict Cycle Condition

We have seen that the Strict Cycle Condition governs application of the stress rule in Russian.³⁵ Stated informally, the SCC blocks application of a cyclic rule R unless the environment in which the rule applies is derived in the immediate cycle in one of the following ways:

1. by concatenation of two morphemes; or
2. by application of a different rule whose output creates the environment for the rule R.

Kiparsky (1982a,b) points out that cyclic rules have one of two functions. They either introduce structure or features or change structure or features. He argues that structure-(feature-) changing rules apply only in derived environments. This follows from the Elsewhere Condition, on the assumption that every lexical entry constitutes an identity rule whose structural description is the same as its structural change. Given a lexical entry (i.e. a lexical identity rule (LIR)) and a cyclic rule, the two will be in a disjunctive ordering relation if: (i) the structural description of the LIR properly includes the structural description of the cyclic rule and (ii) the outputs of each are distinct.³⁶

In Russian, vowels may be designated as metrically prominent in the lexicon (i.e. they may be accented). Moreover, morphemes which are

identical segmentally may differ according to this one property. Thus, accent is a distinctive feature in Russian. It follows that the BAP is a structure-changing, rather than structure-building, rule. Consequently, we expect that the stress rule in Russian will be subject to the Strict Cycle Condition, thus applying only in derived environments.

Consider, for example, the unaccented nominal root [borod] 'beard'. If the BAP applies on the root cycle, it will assign an accent to the initial vowel, with the result that the output of the rule is distinct from the output of the LIR. Thus the LIR will apply, blocking application of the cyclic rule on the first cycle.

In languages in which metrical prominence is not a distinctive property, the stress rule introduces metrical structure and therefore is not subject to the SCC. The outputs of the LIR and the stress rule on the first cycle will not be distinct: one has no metrical structure while the other does. Therefore the stress rule is free to apply on the first cycle.³⁷

1.5.4 [+Accented, -Dominant] Derivational Suffixes

Next let us consider forms derived with suffixes which are accented, but not accent-deleting (i.e. [+accented, -dominant]). We have already encountered suffixes of this type in the inflectional morphology. This is the simplest case of a derived form, requiring no extensions of the analysis developed thus far.

We predict that stress assignment will depend on the accentual property of the root morpheme. If the root is accented, it will get stress; if the root is unaccented, the accented derivational suffix will get stress. Since stress falls on the leftmost accented vowel, an accented derivational suffix will win out over an accented inflectional suffix.

This prediction is verified by nouns derived with the suffix ic. This suffix attaches either to nominal or adjectival stems, forming feminine nouns usually designating some type of female person. Occasionally it acts as a diminutive suffix.

In (35) I give examples of nouns derived with the accented suffix ic, including with each one the noun or adjective from which it is derived and its accentual class (Class A (fixed stress on stem) = accented stems; Class B (fixed stress on inflection) = post-accenting stems; Class C (mobile stress) = unaccented stems). All of the derived nouns fall into Class A, having fixed stress on the stem.

(35) Nouns Derived with the [+Accented, -Dominant] Suffix ic

<u>BASE NOUN</u>		<u>DERIVED NOUN</u>
lůža (A) 'puddle'	---->	lůžica (dim.)
rýba (A) 'fish'	---->	rýbica (affect.)
čast' (C) 'part'	---->	častíca (dim.)
vešč' (C) 'thing'	---->	veščíca (dim.)
vodá (C') 'water'	---->	vodíca
zeml'á (C') 'earth'	---->	zemlíca

<u>BASE ADJECTIVE</u>			<u>DERIVED NOUN</u>
<u>F</u>	<u>PL</u>		
leníva	lenívy (A)	'lazy'	----> lenívica 'lazy female'
golá	góly (C)	'naked'	----> golíca 'naked female'
molodá	mólogy (C)	'young'	----> molodíca 'young married peasant woman'
tupá	túpy (C)	'dull'	----> tupíca 'dimwit'

If the stem to which ic attaches is accented, then the BAP determines that it will also be accented in the derived form. If, on the other hand, the stem is unaccented, then stress will fall on ic, since this suffix is lexically accented.³⁸ Two derivations are shown in (36), one with an accented and one with an unaccented stem.

(36) Derivations

(i) lenívica (f, nom sg)
'lazy woman'

(ii) molodíca (f, nom sg)
'young married
peasant woman'

UR: [[[leniv] ic] a]

UR: [[[molod] ic] a]

L1 *

L0 * *

 | |

CYCLE 1 [XXXXX]

 | | | |

 leniv

BAP SCC

L1 *

L0 * *

 | |

CYCLE 1 [XXXXX]

 | | | |

 molod

BAP SCC

```

      L1      *      *
      L0      *      *
          |      |      |
CYCLE 2  [[XXXXX] XX]
          |||||      ||
          leniv      ic

```

BAP

```

          *
      L1      (*      *)
      L0      (*      *)
          |      |      |
          [[XXXXX] XX]
          |||||      ||
          leniv      ic

```

CONFLATION

```

      L1      *
      L0      (*      *)
          |      |      |
          [[XXXXX] XX]
          |||||      ||
          leniv      ic

```

```

      L1      *
      L0      *      *
          |      |      |
CYCLE 2  [[XXXXX] XX]
          |||||      ||
          molod      ic

```

BAP

```

          *
      L1      (*      *)
      L0      (*      *)
          |      |      |
          [[XXXXX] XX]
          |||||      ||
          molod      ic

```

CONFLATION

```

          *
      L0      (*      *)
          |      |      |
          [[XXXXX] XX]
          |||||      ||
          molod      ic

```



```

      L1      *      *
      L0  (* *)*      *
          | | |      |
CYCLE 3  [[XXXXXXX] X]
          |||||      |
          lenivic    a

```

```

      L1      *      *
      L0  (* *)*      *
          | | |      |
CYCLE 3  [[XXXXXXX] X]
          |||||      |
          molodic    a

```

BAP

```

      L2      *
      L1      (*      *)
      L0  (* *)*      *)
          | | |      |
          [[XXXXXXX] X]
          |||||      |
          lenivic    a

```

BAP

```

      L1      *
      L1      (*      *)
      L0  (* *)*      *)
          | | |      |
          [[XXXXXXX] X]
          |||||      |
          molodic    a

```

CONFLATION

```

      L1      *
      L0  (* *)*      *
          | | |      |
          [[XXXXXXX] X]
          |||||      |
          lenivic    a

```

CONFLATION

```

      L1      *
      L0  (* *)*      *
          | | |      |
          [[XXXXXXX] X]
          |||||      |
          molodic    a

```

lenívica

molodíca

Another example of an accented, recessive suffix is išč. This suffix forms both feminine and neuter nouns with an augmentative (sometimes pejorative) meaning from nominal stems. Examples are given in (37). All of the derived nouns have fixed stress on the stem.³⁹

(37) Nouns Derived with the [+Accented, -Dominant] Suffix išč

<u>BASE NOUN</u>		<u>DERIVED NOUN</u>
kníga (f) (A) 'book'	---->	knížiščá (f)
jáma (f) (A) 'pit'	---->	jámiščá (f)
rýba (f) (A) 'fish'	---->	rýbiščá (f)
bolóto (n) (A) 'swamp'	---->	bolótiščé (n)
golová (f) (C) 'head'	---->	goloviščá (f)
borodá (f) (C) 'beard'	---->	borodiščá (f)
gorá (f) (C) 'mountain'	---->	goriščá (f)
gorod (m) (C) 'city'	---->	gorodiščé (n)

1.5.5 [+Accented, +Dominant] Derivational Suffixes

Next consider the the data in (38). Here we have nouns derived with the suffix ač. This suffix attaches to nominal, adjectival, and verbal stems, deriving masculine nouns referring to a type of person. In each case, the derived noun has fixed stress on the final vowel (i.e. stress pattern B).⁴⁰

(38) Nouns Derived with the Suffix ač

<u>BASE NOUN</u>		<u>DERIVED NOUN</u>
púzo (n) (A) 'belly'	---->	puzáč (B) 'man with paunch'
sméx (m) (A) 'laughter'	---->	smexáč (B) 'person who laughs'
górlo (n) (A) 'throat'	---->	gorláč (B) 'person who yells a lot'
skrip (m) (A) 'squeak'	---->	skripáč (B) 'violinist'
síla (A) 'strong'	---->	siláč (B) 'strong man'
zurná (f) (B) 'zurna' (kind of clarinet)	---->	zurnáč (B) 'one who plays...'
boroda (f) (C) 'beard'	---->	borodáč (B) 'bearded man'
vólos (m) (C) 'hair'	---->	volosáč (B) 'hairy person'

The crucial cases are those nouns which are derived from a base which has an accented stem (i.e. Class A). The analysis I have presented thus far predicts that, regardless of whether the suffix ač is accented or unaccented, the derived form should retain the accent on the same syllable as in the base form. This is because the BAP will select the leftmost accent. And if the stem to which ač attaches is accented, then it should get the stress rather than the suffix.

The data, however, show otherwise. In every form, stress is assigned to the stem-final suffix ač.

Here is where the property of dominance comes in. To account for these facts, we need to postulate that certain suffixes wipe out any accent on the stem to which they attach. As noted earlier, other Indo-European languages whose stress systems are similar to Russian (e.g. Vedic, Lithuanian, Ukrainian, and Serbo-Croatian) have dominant suffixes as well.

I will assume that dominance is a feature associated with a suffix. I will use a subscript d to identify a suffix with this property. The suffix ač is post-accenting (i.e. it derives stems belonging to Class 3), which means that it triggers a rule which transfers the accent to the adjacent syllable on the right. I will represent this by the subscript p.

To understand how stress is assigned to words containing a dominant suffix, let us go through a derivation of the noun siláč 'strong man'. The base noun síla is accented, having fixed stress on the stem. I identify dominant suffixes by the subscript d. Following Lieber (1981), I assume that this feature percolates to become a property of the stem.⁴¹

Having established that the BAP does not apply on the first cycle, I begin the derivation on cycle 2. Rather than posit a rule of Accent Deletion, I assume that affixation of a dominant suffix wipes out any accent on the stem by convention.

(39) Derivation of a Noun Formed from the [+Accented, +Dominant]
Suffix ač

silačá (gen sg) 'strong man'

UR: [[[sil] ač] a]

	L1	*	*		L1	*	
	L0	*	*		L0	*	*
<u>CYCLE 2</u>	[[XXX]	XX]	a/p	---	[[XXX]	XX]	p
	sil	ač			sil	ač	

BAP

	L1	*	
	L0	(*)	(*)
	[[XXX]	XX]	p
	sil	ač	

	L1	*	
	L0	(*)	(*)
<u>CYCLE 3</u>	[[XXXXX]	p	X]
	silač	a	

BAP

----> CONFLATION

	L2	*	
	L1	(*)	(*)
	L0	(*)	(*)
	[[XXXXX]	p	X]
	silač	a	

	L1	*	
	L0	(*)	(*)
	[[XXXXX]	p	X]
	silač	a	

*->

	L1	(*)	
	L0	(*)	(*)
	[[XXXXX]	p	X]
	silač	a	

silačá

The root [sil] is accented.⁴² On the second cycle, a dominant accented suffix is introduced, wiping out the root accent. Since the stem is left with only one accent, namely the accent associated with the suffix, application of the BAP is trivial. An unbounded, right-headed foot is constructed on Line 0, with the accented vowel as head. The third cycle introduces an unaccented inflection. Although the vowel representing the inflection is not lexically accented, the Exhaustivity Condition (see Sect. 1.6) requires that foot-construction apply to the entire string of stressable elements. Therefore, the final vowel comprises a separate foot. Because ač is post-accenting and stem-final in this form, it transfers the accent to the right, onto the inflection. The word surfaces with stress on the inflection in this, as well as all other forms of the paradigm.

It is a curious fact that most dominant accented suffixes are post-accenting. In addition to ač, we find the following: the diminutive suffix Ek and the group of related semi-productive suffixes ak, jak, and yk, which have a variety of meanings. Exceptions to this generalization include the various forms of the augmentative suffix, which forms nouns of the feminine gender: jag, yg, and jug (e.g. rabóta (f) (A) 'work' --> rabotjága (f) (A) 'hard worker'); and the foreign borrowing ist (e.g. svjaz (f) 'communications' --> svjazíst (m) (nom sg), svjazísta (gen sg) 'signaller').

Examples of nouns derived from [+accented, +dominant] suffixes are given in (40). In (i) the citation forms of the derived nouns are gen sg and nom pl; in (ii) the nom and gen sg.

(40) Nouns Derived with [+Accented, +Dominant] Suffixes

(i) ak, jak, yk

BASE NOUN

DERIVED NOUN

ryba (f) (A) 'fish'	---->	rybaká, rybakí (m) (B) 'fisherman'
búr (m) (A) 'auger'	---->	buraká, burakí (m) (B) 'beetroot'
búrsa (f) (A) 'seminary'	---->	bursaká, bursakí (m) (B) 'seminarist'
slíz' (f) (A) 'slime'	---->	sliznjaká, sliznjakí (m) (B) 'worthless person'
kóst' (f) (A) 'bone'	---->	kostjaká, kostjakí (m) (B) 'skeleton'

(ii) Ek⁴³

BASE NOUN

DERIVED NOUN (diminutive)

óbráz (m) (A) 'shape'	---->	obrazók, obrazká (m) (B)
sméx (m) (A) 'laughter'	---->	smešók, smešká (m) (B)
šúm (m) (A) 'noise'	---->	šumók, šumká (m) (B)
kust (m) (B) 'bush'	---->	kustók, kustká (m) (B)
vólos (m) (C) 'hair'	---->	volosók, voloská (m) (B)
volk (m) (C) 'wolf'	---->	volčók, volčká (m) (B)

In this section we have seen that in the presence of certain suffixes, the leftmost accented vowel in the stem does not end up with the stress, in apparent violation of the BAP. To account for these facts, I argued that certain suffixes are accent-deleting. That is, their affixation triggers the elimination of an accent on the stem prior to application of the BAP. I also noted that other Indo-European languages with stress systems closely resembling Russian have suffixes with this property as well. Thus, we now have a two-feature system for classifying suffixes: \pm accented, \pm dominant.

1.5.6 [-Accented, +Dominant] Derivational Suffixes

We have seen evidence of three types of suffixes in Russian: (i) [-accented, -dominant] (ii) [+accented, -dominant] and (iii) [+accented, +dominant]. The feature system provides for a fourth possibility, namely suffixes which are dominant and unaccented. What properties would we expect of this kind of suffix? First, since it is dominant, it should wipe out any accent on the stem to which it attaches. Second, since it has no accent itself, the BAP should assign an accent to the initial vowel of the stem.

There is evidence of one such suffix in Russian. However, it is unproductive and hence there are few examples. The suffix is Enj, and it forms masculine nouns with various meanings. Examples are given in (41). The semantic associations between the related forms require some imagination. What is important to observe is that in every instance, stress falls on the initial vowel of the word.

(41) Nouns Derived with the [-Accented, +Dominant] Suffix Enj

<u>BASE NOUN</u>		<u>DERIVED NOUN</u>
oborót (m) (A) 'turn'	---->	óboroten' (m) (A) 'werewolf'
rasskáz (m) (A) 'story'	---->	rósskazøni (m) (nom pl--no sg) (A) 'old wife's tale'
prolíf (m) (A) (geog.) 'strait'	---->	próliven' (m) (A) 'downpour'
skovorodá (f) (C) 'frying pan'	---->	skóvoroden' (m) (A) (tech.) 'dovetail joint'
xvost (m) (B) 'tail'	---->	příxvosten' (m) 'hanger-on'

Three of the examples have prefixed stems (o+borót, ras+skaz, and pro+liv). This is of particular interest, because prefixes are generally not stressed in Russian. (This issue will be addressed in Chapter 4).

A derivation of a nom sg form (óboroten') is given below. As in the previous section, I identify the dominant suffix by the subscript d. Both the derivational and inflectional suffixes contain a yer, one being [-back] and the other [+back].⁴⁴ I represent these on the segmental plane as capital E and O. The stem yer will undergo Lowering to e on the third cycle (see the discussion in Sect. 1.3), and the inflectional yer will delete post-cyclically. The stem-final glide triggers Secondary Palatalization (C->C'). Another rule deletes a glide word-finally if preceded by a consonant (j->ϕ).

(42) Derivation

	L1		*									
	L0	*	*	*	*			L0	*	*	*	*
<u>CYCLE 2</u>		[XXXXXXXX] XXX]a				---		[XXXXXXXX] XXX]				
		oborot						oborot				
		Enj						Enj				

BAP **---** **CONFLATION**

L2 *

L1 (* *)

L0 (*|* *)

| | | |

{[XXXXXX] xxx}

||||| |

oborot Enj

L1 *

L0 (*)* * *

| | | |

{[XXXXXX] xxx}

||||| |

oborot Enj


```

L1  *
L0  (*) * * * *
    | | | | |
CYCLE 3 [[XXXXXXXXX] X]
    | | | | | | | | |
    oborotEnj 0

```

BAP

```

L2  *
L1  (*) * * * *
L0  (*) * * * *
    | | | | |
    [[XXXXXXXXX] X]
    | | | | | | | | |
    oborotEnj 0

```

---> CONFLATION

```

L1  *
L0  (*) * * * *
    | | | | |
    [[XXXXXXXXX] X]
    | | | | | | | | |
    oborotEnj 0

```

LOWER

e

POST-CYCLIC [oborotenj0]

```

C->C'          n'
E/O->φ          φ
j->φ            φ

```

óboroten' (nom sg)

Affixation of the dominant, unaccented suffix to the accented stem triggers deletion of the stem accent. Then the BAP applies, assigning an accent to the initial vowel and constructing unbounded, right-headed feet on Line 0. Due to the Exhaustivity Condition, two metrical feet are constructed on cycle 2, one consisting of the initial vowel and the other consisting of all remaining Line 0 elements. The second foot is eliminated by conflation. Cycle 3 introduces an inflectional suffix. Regardless of whether the inflection is accented or unaccented, the stem accent "wins" and therefore stress surfaces on the initial vowel.

The fact that I could find only one example of a dominant, unaccented suffix, and a rather unproductive one at that, is curious. Nothing in the analysis predicts that suffixes of a given accentual type will be more highly marked than another. For the moment I will simply leave this as an observation.

1.6 Nonsyllabic Suffixes and the Strict Cycle Condition: Stress Assignment in Nonderived Verbs

1.6.1 Introduction

Verbs present certain complications for my analysis, complications which have their source in the greater complexity of the morphology and segmental phonology of the verbal system. This will be the focus of Chapter 4. In this section, however, I am going to proceed with an introduction to the simplest verb forms and show how the analysis developed thus far does provide an account of stress in nonderived (athematic) verbs. These verbs provide confirmation for the analysis developed thus far. Moreover, they provide us with an important new piece of data concerning the notion of a derived environment and thus have a bearing on our formulation of the Strict Cycle Condition.

1.6.2 Verbal Inflection

Before presenting the various stress paradigms of athematic verbs, I want to familiarize the reader with the morphology of verbal inflections. We will be looking at two tenses: present and past. In contrast to nominal inflections, these are not monomorphemic. Both the present and past tense inflections consist of a tense suffix (TS) and an agreement suffix (AS). In the present tense, the AS represents person and number, while in the past tense the AS represents gender and number.

The present tense suffix of athematic verbs is represented by the vowel e. The agreement suffixes are given in (43).

(43) Person Markers

	SG	PL
1ST	u	m
2ND	ŷ	te
3RD	t	ut

The past tense suffix is l, while the agreement suffixes are identical to those in the short form adjectives (see Sect. 1.5.3): o (m), a (f), o (n), and i (pl).

Now let us turn to the stress patterns of athematic verbs.

1.6.3 Data: Stress Patterns of Nonderived (Athematic) Verbs

There is a relatively small set of verbs in Russian (approximately 90) which consist simply of a root and inflection. These

are traditionally referred to as athematic verbs. These verbs exhibit the same four main stress patterns as nonderived nouns. These patterns are summarized in (44), along with the accentual property I attribute to the root morphemes of each class.⁴⁵

(44) Stress Patterns of Nonderived Verbs

	<u>ROOT</u>	<u>STRESS PATTERN</u>
(i)	Class A: accented	fixed stress on the stem
(ii)	Class B: post-accenting	fixed stress on the inflection
(iii)	Class C: unaccented	mobile stress: on the inflection when it is accented, otherwise on the initial vowel
(iv)	Class B': post-accenting, with Retraction in some forms	shifting stress: on the stem-final vowel in forms where Retraction applies; otherwise on the inflection

Each stress pattern is illustrated in (45). Because consonant deletion or mutation sometimes obscures the underlying form of a root, I include the underlying form with each example.⁴⁶

(45) Stress in the Present and Past Tense of Nonderived (Athematic) Verbs

- (i) STRESS: fixed on the stem
ROOT: Class A (accented)
EXAMPLE: lezt' 'to climb' Root: [lez]

	<u>PRESENT</u>		<u>PAST</u>
	<u>SG</u>	<u>PL</u>	<u>M</u> léz+φ
1	léz+u	léz+em	<u>F</u> léz+la
2	léz+eš	léz+ete	<u>N</u> léz+lo
3	léz+et	léz+ut	<u>PL</u> léz+li

- (ii) STRESS: fixed on the inflection
ROOT: Class B (post-accenting)
EXAMPLE: peč' 'to bake' Root: [pek]

PRESENT			PAST	
	SG	PL	M	
1	pek+ú	peč+ěm	F	pek+lá
2	peč+ěš	peč+ěte	N	pek+ló
3	peč+ět	pek+út	PL	pek+lí

- (iii) STRESS: on the inflection throughout the present
and in the f past; otherwise on the
initial vowel (mobile stress)
ROOT: Class C (unaccented)
EXAMPLE: žit' 'to live' Root: [žiw]˘

PRESENT			PAST	
	SG	PL	M	
1	živ+ú	živ+ěm	F	ží+lá
2	živ+ěš	živ+ěte	N	ží+lo
3	živ+ět	živ+út	PL	ží+li

- (iv) STRESS: on the inflection throughout the present;
on the stem-final vowel throughout the past
(shifting stress)
ROOT: Class B' (post-accenting with Retraction in the past tense)
EXAMPLE: strič' 'to shear' Root: [strig]

PRESENT			PAST	
	SG	PL	M	
1	strig+ú	striž+ěm	F	stríg+la
2	striž+ěš	striž+ěte	N	stríg+lo
3	striž+ět	strig+út	PL	stríg+li

Two of the patterns shown above, namely (iii) and (iv), exhibit alternating stress. The type of pattern illustrated by žit' I refer to as mobile and the one illustrated by strič' as shifting. Recall that I have used the term mobile to refer specifically to stress alternating

between the inflection and the initial vowel of the stem. This pattern occurs when the stem is unaccented. Stress falls on the inflectional suffix when it is accented; otherwise on the initial vowel. Shifting stress, on the other hand, refers to a pattern in which stress alternates between the inflection and the final vowel of the stem. This occurs when the stem is post-accenting, but subject to a rule of Retraction in certain forms.

It happens that all athematic verbs with alternating stress have monosyllabic roots. Consequently, the distinction between mobile and shifting stress is not immediately obvious. However, there are two reasons for analyzing verbs like žit' as having Class C roots and mobile stress and verbs like strič' as having Class B' roots and shifting stress. First, verbs and short form adjectives share the same agreement suffixes. Evidence from the adjectival system showed that only the f agreement suffix is accented (see Sect. 1.5.3). If we assume that verbs like žit' have unaccented roots, then we easily account for the fact that in the past tense stress is on the inflection only in the f form. Second, we shall see later on that when certain verbs with the stress pattern of žit' have prefixed stems, stress may fall on the prefix when the inflection is unaccented. This is never true of strič'-type verbs. Therefore, I assume that verbs like žit' have unaccented roots and mobile stress, while verbs like strič' have post-accenting roots which undergo Retraction in certain forms and therefore shifting stress.~

1.6.4 Morphological Composition of the Present Tense 1st Sg and 3rd Pl

Let us take a closer look at the present tense forms of nonderived verbs. I have said that two suffixes make up the present tense inflection, one denoting tense and the other denoting number and person. Notice, however, that in the 1st sg and 3rd pl, the present tense suffix e never appears. This raises the question whether the suffix e is present underlyingly and deletes or whether it is completely absent in these two forms of the paradigm.

Two facts suggest that the present tense suffix e is absent in the underlying representation of the 1st sg and 3rd pl. First, verbs with unaccented roots have a stress alternation in the past tense but fixed stress on the inflection in the present tense (e.g. Žit'). One thing this tells us is that the present tense suffix e is an accented morpheme. If it were unaccented, stress would fall on the initial vowel in those forms consisting of an unaccented root and a present tense suffix.

Assuming now that the suffix e is accented, suppose that it is present in the underlying representation of the 1st sg and 3rd pl, and that it deletes in the course of the derivation. If we continue to assume that all suffixes are cyclic, then the BAP will apply to the constituent comprising the root and the suffix e ([[ROOT] e]), constructing an unbounded, right-headed foot with the suffixal vowel e

as head. If this vowel deletes, we expect the accent to move to the left. Stress should surface on the root (regardless of the accentual properties of the 1st sg and 3rd pl agreement morphemes). This is illustrated in (46) with the unaccented verb root [žiw], meaning 'live'. I begin the derivation on the second cycle. I will simplify the derivation by including Conflation as part of the BAP.

(46) Predicted Stress in Class C Verbs if Tense Suffix is Present in the 1st Sg and 3rd Pl

1ST SG				3RD PL			
	L1		*		L1		*
	L0	*	*		L0	*	*
<u>CYCLE 2</u>		[[XXX]	X]	<u>CYCLE 2</u>		[XXX]	X]
		žiw	e			žiw	e
BAP				BAP			
	L1		(*)		L1		(*)
	L0	(*	*)		L0	(*	*)
		[[XXX]	X]			[XXX]	X]
		žiw	e			žiw	e

L1 (*) *
 L0 (*) * *
 | | |
CYCLE 3 {[XXXX] X}
 | | | |
 žiwe u

BAP

L1 (*)
 L0 (*) * *
 | | |
 {[XXXX] X}
 | | | |
 žiwe u

V->φ φ
 W->V v
 *živu

L1 (*) *
 L0 (*) * *
 | | |
CYCLE 3 {[XXXX] XX}
 | | | |
 žiwe ut

BAP

L1 (*)
 L0 (*) * *
 | | |
 {[XXXX] XX}
 | | | |
 žiwe ut

V->φ φ
 W->V v
 *živut

Instead, stress surfaces on the agreement suffixes u and ut. This we can account for by assuming that the 1st sg and 3rd pl agreement suffixes are accented, and that the tense suffix is absent in these two forms of the paradigm.

The second piece of evidence which supports my analysis involves the rule of Velar Palatalization (Vel Pal). Recall that this rule changes velar consonants into high coronals (i.e. k->č, g->ž, x->š) when they occur before a [-bk] vowel or glide. In the verbs peč' (root: [pek]) and strič' (root: [strig]), Vel Pal fails to apply in precisely two forms: 1st sg and 3rd pl. The assumption that the present tense suffix e is absent in these forms enables us to account for the velar-palatal alternations in the final consonant of the root.⁴⁰

An alternative hypothesis would be that the present tense suffix is indeed present in all forms, but that it is a noncyclic suffix. We would then need to posit the following rule of vowel deletion: $e \rightarrow \phi / __ u$. This rule would crucially have to apply before Velar Palatalization (Vel Pal) and the BAP. Otherwise, stem-final velars would undergo palatalization and stress would move leftward onto the root after deletion of the tense vowel e. This would, of course, also entail assigning the rule Vel Pal and the BAP to both the cyclic and noncyclic blocks of rules. However, we can reject this hypothesis on both theoretical and empirical grounds. First, it weakens my analysis by introducing noncyclic suffixes, without contributing any greater explanatory power. Second, I will show later on that the assumption that the present tense suffix is absent in the 1st sg and 3rd pl is crucial to explaining stress in derived verbs.

Let us review the analysis of present tense stress in nonderived verbs. Verb roots fall into the same four classes as nominal roots: (i) accented (Class A); (ii) post-accenting (Class B); (iii) unaccented (Class C); and (iv) post-accenting, with Retraction applying in the past tense (Class B'). The present tense suffix e is accented, as are the 1st sg and 3rd pl agreement suffixes, u and ut.⁴⁰ I assume, given the absence of evidence to the contrary, that all suffixes are cyclic. Furthermore, I assume that the 1st sg and 3rd pl forms lack a present tense suffix.

The BAP is a cyclic rule which constructs an unbounded, right-headed metrical constituent with the leftmost accented vowel as head. If there is no accented vowel on a given cycle, the BAP assigns an accent to the initial vowel and constructs a constituent comprising just that one element. The BAP is subject to the Strict Cycle Condition.

Since stress falls on the leftmost accented vowel, verbs with accented roots have stress fixed on the root. Verbs with post-accenting roots transfer their accent to the adjacent vowel on the right. Therefore, stress falls on the final vowel throughout. Verbs with Class B' undergo Retraction in the past tense. Therefore, stress is on the final vowel in the present, and on the penult in the past. Finally, since the present tense suffix, as well as the 1st sg and 3rd pl agreement suffixes, are accented, verbs with unaccented roots have stress fixed on the inflection in the present tense.

Below I give derivations of the 1st sg and pl for each type of nonderived verb (excluding B', since these are identical to Class B in the present tense). I use the subscript p to identify a post-accenting morpheme. The derivations begin with the second cycle. I have simplified the derivations in two ways. First, since the 1st pl agreement suffix is a consonant (m), I include it on the same cycle as the tense suffix. Second, as in the previous derivation, I include line conflation as part of the BAP.

(47) Derivations of Present Tense Forms of Nonderived Verbs

(i) ROOT: Class A

EXAMPLE: lézt 'to crawl' Root: [lez]

1ST SG: lézu

	L1	*	*
	L0	*	*
<u>CYCLE 2</u>		[{XXX} X]	
		lez	u

BAP

	L1	(*)
	L0	(*) *
		[{XXX} X]
		lez u

lézu 'I crawl'

2ND PL: lézem

	L1	*	*
	L0	*	*
<u>CYCLE 2</u>		[{XXX} X]	
		lez	e

BAP

	L1	(*)
	L0	(*) *
		[{XXX} XX]
		lez em

lézem 'we crawl'

(ii) ROOT: Class B

EXAMPLE: peč' 'to bake' ROOT: [pek]

1ST SG: pekú

	L1	*	*
	L0	*	*
<u>CYCLE 2</u>		[[XXX] _p	X]
		pek	u

BAP

L1	(*)	
L0	(*)	*
	[[XXX] _p	X]
	pek	u

*->

L1		(*)
L0	(*	*)
	[[XXX] _p	X]
	pek	u

pekú 'I bake'

2ND PL: pečēm

	L1	*	*
	L0	*	*
<u>CYCLE 3</u>		[[XXX] _p	XX]
		pek	em

BAP

L1	(*)	
L0	(*)	*
	[[XXX] _p	XX]
	pek	em

*->

L1		(*)
L0	(*	*)
	[[XXX] _p	XX]
	pek	em

Vel Pal

pečēm 'we bake'

(iii) ROOT: Class C

EXAMPLE: Žit' 'to live' ROOT: [Žiw]

1ST SG: Živú

	L1		*
	L0	*	*
<u>CYCLE 2</u>		[[XXX]	X]
		Žiw	u

BAP

	L1		(*)
	L0	(*	*)
		[[XXX]	X]
		Žiw	u
		<u>Živú</u>	'I live'

1ST PL: Živēm

	L1		*
	L0	*	*
<u>CYCLE 2</u>		[[XXX]	XX]
		Žiw	em

BAP

	L1		(*)
	L0	(*	*)
		[[XXX]	XX]
		Žiw	em
		<u>Živēm</u>	'we live'

1.6.5 The Nonsyllabic Suffix l

In the past tense, nonderived verbs with unaccented roots have mobile stress. In the f form, stress is on the final vowel, and in the other three forms stress is on the initial vowel. This pattern is significant for two reasons. First, it tells us that the past tense verbal agreement suffixes have the same accentual properties as the short form adjectival agreement suffixes (see Sect. 1.5.3). The feminine a is accented, while the others are unaccented (o (m), o (n), and i (pl)). Second, it shows that a nonsyllabic suffix (in this case the past tense suffix l) fails to trigger the BAP.

Let us assume that the tense suffix l is cyclic. Then the past tense form of a nonderived verb consists of three cycles: root + tense suffix (TS) + agreement suffix (AS). If it were the case that the past tense suffix triggered the BAP, then on the second cycle the BAP would apply, assigning an accent to the initial vowel of the root and constructing a Line 0 metrical constituent consisting of that one vowel. This analysis predicts that verb roots which are underlyingly unaccented will always bear an accent by the time the agreement suffix enters the derivation (i.e. cycle 3). Since stress falls on the leftmost accented vowel, we would then expect Class C verbs to have stress fixed on the root (i.e. on the initial vowel) in all forms of the past tense. The fact that they do not have fixed stress on the root, but rather have mobile stress, shows that the nonsyllabic suffix l does not trigger the BAP.

Although vowels are the only stressable elements in Russian, this fact does not in principle rule out the possibility that in a language like Russian, with an accent-based stress system, nonsyllabic suffixes could bear an accent. However, I have assumed, following Halle and Vergnaud (1987), that only vowels are projected onto the stress plane. Since a nonsyllabic suffix is not represented on the stress plane, it is not visible to the BAP. Therefore, a nonsyllabic suffix does not create a derived environment for the BAP, and consequently the Strict Cycle Condition will block the BAP from applying on that cycle. The same suffix may, of course, trigger a cyclic rule on some other

antosegmental plane, e.g. a segmental rule on the melody plane. In fact, we will see evidence of this in Chapter 2.

Derivations of the f and pl past tense forms of žít 'to live' are given below.

(48) Derivations of Past Tense Forms of a Nonderived Verb with an Unaccented Root

<u>F: žilá</u>		<u>PL: žíli</u>	
UR: [[[žiw]l]a]		UR: [[[žiw]l]i]	
L1 L0 * <u>CYCLE 2</u> [[XXX] X] žiw l		L1 L0 * <u>CYCLE 2</u> [[XXX] X] žiw l	
BAP	SCC	BAP	SCC
L1 * L0 * * <u>CYCLE 3</u> [[XXXX] X] žiwl a		L1 * L0 * * <u>CYCLE 3</u> [[XXXX] X] žiwl i	
BAP		BAP	
L1 * L0 (* *) [[XXXX] X] žiwl a		L1 * L0 (* *) [[XXXX] X] žiwl i	
<u>žilá</u> 'she lived'		<u>žíli</u> 'they lived'	

Past tense stress in the other three classes of nonderived verbs is straightforward. Verbs with accented roots have stress fixed on the

root. Those with post-accenting roots have stress fixed on the inflection (except in the *m* form where the *yer* deletes, causing stress to shift back onto the root). Those with post-accenting roots which undergo Retraction in the past tense, have stress on the root in this tense (but on the inflection in the present).

1.7 Summary

We have focused thus far on stress assignment in nouns, with some discussion of stress in nonderived verbs. From the data presented, we have seen that stress assignment in Russian is the product of rule-governed interactions between lexical properties of morphemes and word-formation processes.

Four major stress patterns occur in nonderived nouns: (i) Class A: fixed stress on the stem; (ii) Class B: fixed stress on the inflection; (iii) Class B': shifting stress, alternating between the inflection in the pl and the stem-final vowel in the sg; and (iv) Class C: mobile stress, alternating between the initial vowel and inflection.

To account for the complex patterns of alternating and fixed stress, I adopted a two-feature system for classifying the accentual properties of morphemes: [\pm accented, \pm dominant]. Each type of suffix is attested in the language. In addition, I noted that a subset of accented

morphemes are post-accenting. I argued that Class A nouns have accented stems; Class B nouns have stems which are post-accenting in all forms; Class B' nouns have stems which are post-accenting in the sg only; and Class C nouns have unaccented stems. I adopted the Indo-European Basic Accentuation Principle (BAP) as the rule assigning stress in Russian, and showed that it applies cyclically.

Finally, I observed that there is an important relation between the derivational status of nouns and their stress properties: namely, mobile stress only occurs in nonderived forms. My analysis predicts that this generalization should extend to all lexical categories. The assumption that all suffixes are cyclic is crucial to explaining this generalization. My analysis therefore argues against the reduction of dominance to cyclicity. The fact that shifting stress does occur in nonderived words shows that the stress rule in Russian is subject to the Strict Cycle Condition. This is what we expect. Given that accent is a distinctive property of morphemes in Russian, the stress rule is structure-changing rather than structure-building.

1.8 APPENDIX A: Mobile Stress Paradigms

Nouns with unaccented roots have mobile stress. Because there are four distinct (though overlapping) sets of nominal inflections,

there are four different mobile stress patterns. These serve as the basis for determining the accentual properties of inflectional suffixes. Stress on the inflection indicates an accented inflection, while stress on the root indicates the inflection is unaccented.

The four mobile stress paradigms are given below.

(i) zérkalo (n) 'mirror' Root: [zermal]

	SG	PL
NOM	zérkal+o	zermal+á
ACC	zérkal+o	zermal+á
GEN	zérkal+a	zermal+ø
DAT	zérkal+u	zermal+ám
INSTR	zérkal+om	zermal+ámi
LOC	zérkal+e	zermal+áx

(ii) vólos (m) 'hair' Root: [volos]

	SG	PL
NOM	vólos+ø	vólos+y
ACC	vólos+ø	vólos+y
GEN	vólos+a	volós+ø
DAT	vólos+u	volos+ám
INSTR	vólos+om	volos+ámi
LOC	vólos+e	volos+áx

(iii) borodá (f) 'beard' Root: [borod]

	SG	PL
NOM	borod+á	bórod+y
ACC	bórod+u	bórod+y
GEN	borod+ý	boród+ø
DAT	borod+é	borod+ám
INSTR	borod+ój	borod+ámi
LOC	borod+é	borod+áx

(iv) plóšcad' (f) 'area' Root: [ploščad]

	SG	PL
NOM	plóščad'+ø	plóščad+i
ACC	plóščad'+ø	plóščad+i
GEN	plóščad+i	ploščad+ej
DAT	plóščad+i	ploščad'+ám
INSTR	plóščad'+ju	ploščad'+ámi
LOC	plóščad'+i	ploščad'+áx

1.9 APPENDIX B: Exceptional Stress in a Small Class of Loan Words

There are a number of English loan words in Russian which end in the sequence -or. Examples include: ténor, diréktor, tráktor, and proféssor. Some of them (including the four cited above) have a stress pattern which is not predicted by my analysis. In the sg, stress is fixed on the stem. More important is the fact that in trisyllabic roots, stress is fixed on the second syllable of the stem throughout the sg. In the pl, stress is fixed on the inflection. This is illustrated below, with the noun diréktor.

	SG	PL
NCM	diréktor+ ϕ	direktor+á
GEN	diréktor+a	direktor+óv
DAT	diréktor+u	direktor+ám

One way of handling these is to stipulate that there are two distinct underlying forms of the root morpheme, one for the sg and one for the pl. The sg form is accented, while the pl form is unaccented.

Most loan words ending in the sequence -or do not have exceptional stress (e.g. seléktor, invéstor, imitátor). Stress is fixed on the same syllable throughout the inflectional paradigm, which indicates that the root is underlyingly accented (Class A).

Most of those which do exhibit the exceptional stress pattern end in the sequence -ktor.

Notes: Chapter 1

1. In Russian, consonants are softened before a front vowel or glide. This means that they undergo a process that I refer to as Secondary Palatalization, whereby the blade of the tongue is raised toward the palate, without altering the primary place of articulation. The symbol ' indicates a soft consonant.

I will only include this diacritic feature in cases where the soft consonant is not predictable from the surface form, due to deletion of the front vowel or glide.

2. Russian nouns are distinguished by gender (masculine (m), neuter (n), and feminine (f)) and inflect for number and case. There are six cases: nominative (nom), genitive (gen), dative (dat), accusative (acc), locative (loc), and instrumental (instr).

3. In an extensive examination of Russian accent, Halle (1973) provides a typology of all the major nominal stress patterns, including their correlation with gender and declension and their relative frequency. Although the analysis developed below differs in fundamental ways from the one he presents, that study provided the foundation on which much of my own work is based.

4. The vast majority of nouns exhibit one of these four patterns. One additional nominal stress pattern will be discussed later on.

5. These figures are based on data in Halle (1973) and Zaliznjak (1967).

6. y represents a high, back, unrounded vowel.

7. Orthographic ë, a reflex of e under stress, is phonetically ó.

8.
Abbreviations:

nominative	nom
genitive	gen
dative	dat
accusative	acc
instrumental	instr
locative	loc
singular	sg
pl	pl

9. As mentioned above, all F_b stems end in a soft (i.e. palatalized) or sibilant consonant. The grapheme i is always preceded by a soft consonant, alternating with y, which follows hard consonants. I will gloss over for now the details of the segmental phonology that relate to the hard/soft distinction, since these have no bearing on my analysis of stress.

10. This idea was originally proposed by Jakobson (1963), in his work on Slavic, and further developed in Jakobson (1965). The proposal has been adopted in subsequent work on stress systems of Indo-European languages, including Kiparsky and Halle (1977), Halle (1973), Kiparsky (1982), Zaliznjak (1985), and Halle and Vergnaud (1985).

11. There is a small subset of nouns which deviate from this pattern in one form: in the acc sg stress falls on the inflection, rather than on the initial vowel. Examples include: slobodá (acc sg: slobodú) 'historically, a settlement exempted from normal State obligations'; borozdá (acc sg: borozdú) 'furrow'; and skovorodá (acc sg: skovorodú) 'frying pan'. According to Zaliznjak (1977), the latter two may have stress either initially or finally in the acc sg. I will argue that this deviation is due to the ambiguous accentual status of this inflection: i.e. it may be either accented or unaccented, the accented alternant being preferred in contemporary Russian.

12. As formulated in (8), the rule of Post-Accentuation applies only to representations in which the vowel assigned stress by the BAP is penultimate, thus implying that the rule only transfers stress to a word-final syllable. I will present evidence for this condition later on, when we turn to stress assignment in derived forms.

13. Recall that ë is a reflex of e under stress.

14. One type of evidence I looked for was a pattern in which stress in the singular is on the inflection and in the plural on a pre-penultimate syllable. Given that the Retraction rule retracts stress only one syllable, such a pattern could be interpreted as evidence that Post-Accentuation simply doesn't apply in the plural, thus permitting the accented vowel of the root to get stress. I found no such pattern.

M. Kenstowicz (personal communication) suggested that there might be difference in vowel quality between final vowels which were never assigned stress in the course of the derivation and those to which stress was assigned and then retracted, thus supporting the Retraction analysis. I have not found any evidence of such a difference.

15. For inanimate m and n nouns, the nom and acc inflections are the same.

16. In their work on Polish phonology, Gussman (1980) and Rubach (1984) come to the same conclusion, arguing that yers are part of the underlying structure of Polish. However, Gorecka (1986) argues against an analysis which posits underlying yers and proposes instead a vowel epenthesis analysis of vowel-zero alternations in Polish.

17. Under certain conditions, which need not concern us here, a stressed mid front vowel becomes [+bk]. This accounts for the surface form ok when the suffixal vowel is stressed.

18. There is a rule which palatalizes velar consonants before a [-bk] vowel or glide (k->č, g->ž, x->š).

19. There is another process affecting consonants in Russian which also occurs before front vowels, and which is also commonly referred to as palatalization. This process, which I refer to as Secondary Palatalization, involves raising the blade of the tongue toward the palate while maintaining the underlying point of articulation, with the result that the consonant is softened. In derivations this rule is represented by the symbols C->C'. It applies post-cyclically. We can infer that the inflectional yers are specified [+bk] by the fact that stem-final consonants do not undergo Sec Pal in the nom or acc sg or gen pl.

20. On the basis of stress alone, one could argue that there is no nom sg inflectional morpheme. However, the examples in (20) show that in m nouns exhibiting vowel-zero alternations, the stem-final vowel surfaces in the nom sg. For the Lower rule to apply, the inflectional suffix must be an underlying yer.

21. The idea of treating stress by means of the same basic formalism as tone was first proposed by Liberman (1975).

22. In this respect the Halle and Vergnaud theory poses a challenge to the theory of Prince (1983), which denies the existence of constituents in the metrical grid.

23. Thus far we have only observed deletion of a vowel in word-final position (i.e when the inflectional suffix is a yer). In Chapter 4, I will show that word-internally, when an accented vowel becomes a glide, the accent shifts to the left.

24. This generalization will be qualified later on when I show that there is a class of suffixes which trigger deaccentuation of the stem.

25. Vedic Sanskrit has the same stress rule as Russian (see Kiparsky and Halle (1977) and Kiparsky (1982c)). However, an accent moves to the right when an accented vowel deletes or becomes a glide. Thus, in contrast to Russian, Line 0 constituents in Sanskrit are unbounded and left-headed.

26. This generalization was independently noted by Shapiro (1965). I am grateful to Wayles Browne for pointing this out to me.

27. A short form adjective functions as a sentence predicate, while a long form adjective occurs internal to an NP.

28. Fixed stress on the root and fixed stress on the suffix are illustrated by the following examples:

	<u>M</u>	<u>F</u>	<u>N</u>	<u>PL</u>	
<u>CLASS A:</u>	unýl+φ	unýl+a	unýl+o	unýl+y	'depressed'
<u>CLASS B:</u>	golúb+φ	golub+á	golub+ó	golub+y^	'pale blue'

29. Due to spacing constrictions in some derivations, I will occasionally use the symbol | in place of back-to-back parentheses)(to mark a boundary between two constituents. Thus, for example, the representation (* * *|* * *) is equivalent to the representation (* * *)(* * *).

30. Some nouns whose stems end in the sequence -nik appear to have stress fixed on a different stem vowel from what we would expect. Examples include the following (I cite the related nonderived noun for each): (i) večérnik 'nightschool student' (véčer (C) 'evening') and (ii) zavístnik 'jealous person' (závist (A) 'envy'). If these words were derived from the related nonderived noun, we would expect the following: (i) *véčernik (ii) *závistnik. However, there is a suffix ik which forms nouns from adjectival stems ending in -(e)n. Both of these nouns are actually derived from an adjectival, rather than a nominal stem: (i) večérnyj (A) 'evening' --> večérnik; (ii) zavístnij (A) 'jealous' --> zavístnik. Therefore, stress in the derived forms is what we would predict. However, there are some nouns derived with the suffix nik

which are exceptions: (i) pomóšćnik 'helper' (from pómošć (C) 'help') and (ii) lošádnik 'horse-lover' (from lóšad (C) 'horse').

31. Unless an inflectional suffix is accent-deleting and itself accented. There is one inflection that does seem to have a dominant, accented allomorph: the gen pl inflection ej. This is suggested by a noun like plóšćad (f) 'square,' which has stress on the stem throughout the sg and in all forms of the pl except the gen. This tells us that the stem is accented. In the gen pl, however, the accent falls on the inflection: plošćad+éj. That this suffix has a non-dominant allomorph is shown by the stress pattern of tetrád (f) 'notebook,' which also takes the gen pl inflection ej. Stress in this noun falls on the stem in all forms, including the gen pl (tetrádej). The [+dominant] allomorph does not occur in derived nouns.

Recall that we encountered a similar type of allomorphy in the acc sg inflection of the f_{a} declension.

32. This is true in Vedic Sanskrit and Lithuanian, as well (see Kiparsky and Halle (op.cit.) and Kiparsky (1982c)).

33. Similar conclusions are reached by Cole (1987), in her work on the phonology and morphology of Seri, and by Czajkowska-Higgins (1989), in her work on stress in Columbian Salish.

34. Unfortunately, this leaves unexplained the ordering of dominant and recessive suffixes.

35. The Strict Cycle Condition was first proposed by Chomsky (1973) for syntax. Kean (1974) was the first to argue that the Strict Cycle Condition is a principle governing the application of phonological processes as well. According to Kean's proposal, a derived environment is created by affixation. Specifically, she states that "on any cycle A no cyclic rule may apply to material within a previous cycle B without making crucial use of material uniquely in A (p. 179)." Her proposal was revised by Mascarò (1976), to include another condition: that a rule R can make use of material uniquely contained within B by a rule applying before R.

36. Kiparsky's precise formulation of the Elsewhere Condition is as follows:

Rules A,B in the same component apply disjunctively
to a form Φ if and only if

- (i) The structural description of A (the special rule) properly includes the structural description of B (the general rule).
- (ii) The result of applying A to Φ is distinct from the result of applying B to Φ . (Kiparsky (1982a, p.8)).

37. Rules of syllabification are usually structure-building, and hence free of the SCC, as well.

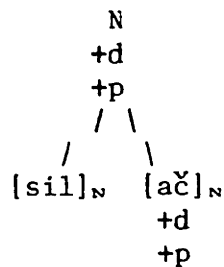
38. One apparent exception is graníca 'frontier, border'. There is a nonderived noun, gran 'border, verge', which has fixed stress (Class A). If the root morpheme [gran] is accented, we expect stress in the derived noun to be *gránica. However, it could be argued that the stem is treated as one morpheme. If so, then its stress is consistent with other nouns which have the sequence ic in the stem, but are clearly not derived stems. Examples include: stolíca 'capital'; tablíca 'table'; and kaplíca 'Roman Catholic chapel'.

We should also note that there is evidence of a [+accented, +dominant] nominalizing suffix ic, which derives the female form of a noun referring to a person or animal. Stress ends up on the suffix, regardless of the accentual property of the stem. Examples include: tigríca 'female tiger' (from tígr (A) 'tiger'); caríca 'tsarina' (from car (B) 'tsar'); and orlíca 'female eagle' (from orěl (B) 'eagle').

39. There are some exceptions. For example, grjazíščá comes from a Class A noun grjáz (f) 'mud'. We would expect stress on the root morpheme: *grjáziščá. Also, from the Class B noun, temnotá (f) 'darkness' we get temnotíščá rather than the expected *temnótiščá.

40. As we would expect, a noun with an unanalyzed stem that happens to end in the syllable ač does not behave in the same way as nouns derived with the suffix ač: e.g. díspač (nom sg), díspača (gen sg).

41. Lieber (1981) proposes the Feature Percolation Convention. One part of that convention is stated as follows: "All features of an affix morpheme, including category features, percolate to the first branching node dominating that morpheme." (p. 49) A representation of the stem of the derived noun siláč is shown below:



42. The nonderived noun síla has fixed stress on the root.

43. Because this suffix contains a yer, the derived forms will show vowel-zero alternations. The Lower rule will apply in the nom sg and gen pl, since the underlying vowels representing these inflectional suffixes are yers. Therefore, a mid-vowel surfaces in these two cases.

Note that velar consonants (k, g, x) palatalize before this suffix. Descriptively, the rule is as follows:

{k,g,x} --> {č, ǰ, š} / ___ [-cons, -bk]. This rule is cyclic. A later, noncyclic rule, backs e before a hard consonant. This explains why the [-bk] yer E surfaces as o in the nom sg and gen pl.

44. We know that the nom sg inflection is not a front vowel because stem-final consonants are not raised (i.e. they do not undergo Secondary Palatalization) in the nom sg form. We also know that it is unaccented, because nonderived nouns with unaccented roots have stress on the initial vowel in the nom sg (e.g. górod (nom sg), górodu (dat sg), gorodá (nom pl), gorodám (dat pl) 'city'; vólos (nom sg), vólosu (dat sg), vólosy (nom pl), volosám (dat pl) 'hair').

45. There is one athematic verb whose stress is exceptional: moč' 'to be able'. The pattern is as follows:

	PRESENT		PAST
	SG	PL	
1ST	mog+ú	móž+em	M: móg+ø
2ND	móž+eš	móž+ete	F: mog+lá
			N: mog+ló
3RD	móž+et	móg+ut	PL: mog+lí

The most obvious way of accounting for this verb is to say that it is post-accenting, with Retraction occurring in all forms of the present tense, except the 1st sg. We will see that the stress pattern of this verb coincides with the stress pattern of a large class of derived verbs discussed in Chapter 4.

46. I will generally confine my discussion of segmental processes to those which have a direct bearing on stress assignment.

Although consonant truncation in past tense forms of nonderived verbs does not affect stress, it is of some interest for other reasons. The

conditions under which they apply suggest that they are sensitive to the distinction between inflectional and derivational morphology.

Consider the m past tense forms of these four athematic verbs. I give both their surface and underlying representations:

- (i) lez 'crawl' UR: [[[lez] 1] 0]
- (ii) pek 'bake' UR: [[[pek] 1] 0]
- (iii) klal 'put' UR: [[[klad] 1] 0]
- (iv) žil 'live' UR: [[[žiw] 1] 0]

Yer-deletion applies in all of the examples.

Another rule deletes coronal stops before the past tense suffix l. This explains the deletion of the root-final d in klal. This rule is morphologically conditioned, for the same clusters are allowed in m short form adjectives: e.g. podl 'mean'. In the case of the adjective, l is a derivational suffix, which suggests that the rule may be sensitive to the distinction between derivational and inflectional morphemes.

Another rule deletes a word-final l which is part of a consonant cluster (e.g. pek). This process is also morphologically conditioned, failing to apply before the adjectival suffix l (i.e. in the masculine short form of the adjective). Lightner cites a number of minimal pairs: čax (UR: [[[čax] 1] 0]) 'he withered', čaxl (UR: [[[čax] 1] 0]) 'stunted'; xrip (UR: [[[xrip] 1] 0]) 'he became hoarse', xripl (UR: [[[xrip] 1] 0]) 'hoarse'; and blek (UR: [[[blek] 1] 0]) 'he faded', blekl (UR: [[[blek] 1] 0]) 'faded'.

The truncation of v in Żil is due to a syllable-structure constraint which disallows a sonorant + consonant sequence in a coda. If the consonant following the sonorant cannot join the onset of a following syllable, the sonorant drops. In Russian, v derives from the glide w (cf. Lightner, 114-115). Therefore, the rule applies to the form Żiwl to derive Żil.

Note that yer-deletion must precede all the consonant-truncation rules. Among the latter, the rule l-->∅/ C__#v must apply last.

47. There is a rule which changes w to v before a vowel. This accounts for the present tense form of the root.

48. Gussmann (1980a) and Rubach (1984) assume that the present tense suffix is absent in the 1st sg and 3rd pl present tense in Polish for precisely this reason.

49. The only other present tense agreement suffix which contains a vowel is the 2nd pl - te. I will assume that it is unaccented. However, nothing hinges on this assumption. Since it is always preceded by the accented present tense suffix, te could never get stress.

Chapter 2

ABSTRACT VOWELS IN RUSSIAN

2.1 Introduction

In Chapter 1 we saw that a mobile stress pattern, in which stress alternates between the initial and final syllable, occurs only in words with unaccented stems. It is the different accentual properties of inflectional suffixes that produces the pattern of alternating stress. If the inflection is accented, it gets the stress; if it is unaccented, the default clause of the BAP will assign an accent to the initial vowel of the word, and stress will surface on the initial syllable.

I observed that in the nominal system, this kind of stress pattern is limited to nonderived forms (i.e. the Nonderived Noun Generalization). I showed that this generalization follows from two assumptions:

1. the BAP is a cyclic rule; and
2. all suffixes are cyclic.

These assumptions lead to the prediction that a stem which contains more than one morpheme cannot enter the inflectional cycle without an accent.

To see this, consider the case of a bimorphemic stem, in which neither stem morpheme bears a lexical accent. The BAP will not apply on the first cycle, due to the Strict Cycle Condition. On the second cycle, the BAP does apply, assigning an accent to the initial vowel. Since stress falls on the leftmost accented vowel, even if the inflectional suffix is accented, the accented vowel of the stem will get the stress. This is illustrated below. I have included line conflation as part of the BAP (see Chap. 1, Sect. 4).

(1) Illustration of Stress Assignment in a Word with a Bimorphemic, Unaccented Stem

	L1			
	L0	*	*	*
<u>CYCLE 2</u>		[XXXXX]	XX]	
		CVCVC	VC	
BAP				
	L1	*		
	L0	(*)*	*	
		[XXXXX]	XX]	
		CVCVC	VC	

```

      L1  *      *
      L0 (*)* *  *
          | | |  |
CYCLE 3 [[XXXXXXX] XX]
          |||||  ||
          CVCVCVC VC
BAP
      L1  *
      L0 (*)* *  *
          | | |  |
          [[XXXXXXX] XX]
          |||||  ||
          CVCVCVC VC

```

My analysis predicts that the Nonderived Noun Generalization should extend to all lexical categories. Thus we expect that adjectives and verbs whose stems include a syllabic derivational suffix will not exhibit mobile stress. However, there appears to be a substantial number of counterexamples to this claim. Many derived adjectives have mobile stress.

I will begin this chapter by examining these problematic data and then proposing a solution which preserves my earlier assumption that all syllabic suffixes are cyclic. It turns out that the adjectives which violate what I will henceforth call the Nonderived Word Generalization, are all derived from suffixes whose only vowel is a yer. Following an idea proposed by Kenstowicz and Rubach (1987) in their work on Slovak syllable structure, I will argue for an autosegmental treatment of the yers in these suffixes which in effect allows us to treat the suffixes as nonsyllabic. I will argue that in their underlying representation,

these yers are represented only on the segmental tier, and thus are not visible to the stress rule.

I will then go on to present additional problems in the segmental phonology and stress of derived nouns. I will show that this autosegmental analysis of the yers can be naturally extended in a way that solves these problems. We will see that the autosegmental analysis provides us with three logical possibilities for the underlying representations of yers:

1. A yer may consist of a set of floating features on the segmental plane:¹

SYLLABLE PLANE:

SKELETON:

SEGMENTAL PLANE: $\Phi = [-\text{cons}, -\text{hi}, -\text{lo}, \text{fback}]$

I will refer to this as a Φ -yer.

2. A yer may be a segmentally unspecified syllable nucleus associated with a timing slot in the skeleton.

SYLLABLE PLANE: N

SKELETON: X

SEGMENTAL PLANE:

I will refer to this as an X-yer.

3. A yer may combine both of these. In other words, it may consist of segmental features which are not underlyingly associated with the skeletal tier, but at the same time have a nuclear projection from the skeletal tier onto the syllable and stress tiers.

SYLLABLE PLANE:	N
SKELETON:	X
SEGMENTAL PLANE:	Φ

I will refer to this as a ΦX-yer.

By virtue of its status as a vowel, a yer which is associated with a syllable nucleus in its underlying representation is represented on the stress plane.

The term yer will now be used specifically to refer to a segment which is in some way structurally deficient in its underlying representation. I will show that each of these three types of yers is attested in Russian. In other words, my claim is that what has traditionally been identified as a pair of front and back high, lax vowels are actually three underlyingly distinct vowels in Russian. The distinctions between them are structural. We will see that each of these yers exhibits precisely the properties we would predict from its underlying representation.

Irrespective of their structural differences, all yers surface as either a front or back mid vowel (e or o). I will continue to use the capital letters E and O to represent these abstract vowels, making no orthographic distinction among the three types.

It is important to keep in mind that there are two different types of vowel-zero alternations which a yer can exhibit, for which I will use the terms paradigmatic and syntagmatic. If a yer is in a stem-final syllable, then it will exhibit vowel-zero alternations within an inflectional paradigm. If a suffix containing a yer is embedded in a stem, the yer will either surface in all forms of the paradigm or in none of the forms, depending on the specific phonological environment (i.e. whether the derivational suffix which follows contains a yer).

2.2 Mobile Stress in Derived Short-Form Adjectives

2.2.1 The Problem

In the previous chapter I showed that both dominant and recessive suffixes in Russian are cyclic. One source of evidence consisted of nouns derived from unaccented adjectival roots with the [-accented, -dominant] suffix ost. When both morphemes comprising the stem

are unaccented, stress uniformly falls on the initial vowel of the stem, never on the inflection.

Three examples are given in (2). Included are two forms of the derived noun, one with an unaccented inflection (sg) and the other with an accented inflection (pl).

(2)

<u>BASE ADJECTIVE</u>			<u>DERIVED NOUN</u>		
<u>F</u>	<u>PL</u>		<u>DAT SG</u>	<u>DAT PL</u>	
skor+á	skór+y	'fast'	---	skórost+i	skórost+am 'speed'
slab+á	sláb+y	'weak'	---	slábost+i	slábost+am 'weakness'
grub+á	grúb+y	'coarse'	---	grúbost+i	grúbost+am 'rude remark'

I also presented evidence to show that nonsyllabic suffixes are ignored by the BAP and thus do not constitute a cycle for the stress rule. The relevant examples were past tense forms of athematic verbs. Because the past tense inflection is bimorphemic, consisting of the past tense suffix l and a vocalic agreement marker, these verbs consist of three morphemes. Nevertheless, when the root is unaccented, stress will alternate between an accented inflection and the root (Ži+l+á 'she lived', Ži+l+o 'it lived', Ži+l+i 'they lived'). This follows from the formal representation, since a nonsyllabic suffix has no vowel to project onto the stress plane.

2.2.2 Data

With this analysis in mind, consider the data in (3). Here we have short form adjectives consisting of a root, adjectival suffix, and inflection. The data are divided into two groups: the first are adjectives derived with the suffix En, the second are derived with the suffix Ok. Recall that yers vocalize when the following syllable contains a yer; otherwise they delete (see Chap. 1, Sect. 3). Three forms are given: m, f, and pl.

(3) Mobile Stress in Adjectives Derived with Suffixes En and Ok

(i) En

<u>ROOT</u>	<u>DERIVED ADJECTIVE</u>			
	<u>F</u>	<u>M</u>	<u>PL</u>	
slav	slavn+á	sláven+φ	slávn+y	'glorious'
trud	trudn+á	trúden+φ	trúdn+y	'difficult'
mrak	mračn+á	mráčen+φ	mráčn+y	'gloomy'
dux	dušn+á	dúšen+φ	dúšn+y	'stuffy'
drug	družn+á	drúžen+φ	drúžn+y	'friendly'
xolod	xolodn+á	xóloden+φ	xólodn+y	'cold'
golod	golodn+á	góloten+φ	gólodn+y	'hungry'

(ii) Ok

<u>ROOT</u>	<u>DERIVED ADJECTIVE</u>			
	<u>F</u>	<u>M</u>	<u>PL</u>	
gib	gibk+á	gíbok+φ	gíbki ²	'pliant'
mel	melk+á	mélok+φ	mélki	'petty'
krep	krepk+á	krépok+φ	krépk+i	'strong'
leg	legk+á	légok+φ	légki	'light'
korot	korotk+á	kórotok+φ	kórotki	'short'

These words exhibit the canonical stress pattern of words whose stems are unaccented, with stress alternating between the initial vowel

and the inflection. Notice, in particular, the forms containing polysyllabic roots. The question is this: since all of these stems consist of both a root and derivational suffix, how do they escape the BAP on the second cycle?

One answer might be that they don't escape it. The argument would go like this: En is a dominant, post-accenting suffix and there is Retraction in all forms except the feminine.

However, three important pieces of evidence show that this cannot be right. First, these adjectives exhibit exactly the same stress as we saw in nonderived adjectives with unaccented roots (e.g. molod+á, mólod+ø, mólod+y 'young'). Recall that in my analysis of this pattern, I postulated that the *f* agreement suffix is accented, while the others are unaccented. This was consistent with the analysis of past tense athematic verbs, where we find the same type of alternating stress and the same set of agreement suffixes.

Second, the Retraction rule operative in the nouns moves the stress one syllable to the left. In the examples in (3), a Retraction rule would have to be formulated in such a way that it allows stress to be shifted one, two, or even three syllables to the left, depending on the number of syllables in the stem, in order to ensure that stress always ends up on the initial syllable in all forms except the *f*.

Third, the vast majority of adjectives derived with En have stress fixed on the root, which shows that the suffix is not dominant, let alone post-accenting with Retraction (e.g. págubn+a, páguben+φ, págubn+y 'ruinous'; směžn+a, směžen+φ, směžn+y 'adjacent'; zlóstn+a, zlósten+φ, zlóstn+y 'malicious'). Thus we have firm grounds for assuming that the stems in these derived adjectives are unaccented, and we can proceed to explain why.

2.3 An Autosegmental Analysis of the Yers: Background

All of the Slavic languages have a set of vowels which, in specific contexts, alternate with zero. These were discussed in Chapter 1, Sect. 3. In surface form, they are indistinguishable from front and back mid vowels (e and o) which exhibit no such alternation. Lightner (1965, 1972) proposed an analysis of these vowels (yers) in Russian in which he postulated an underlying vocalic inventory that distinguished between tense and lax high vowels, even though such a distinction is not manifested in surface representation. He proposed that yers are underlyingly [+hi, -lo, -tns], and undergo either a process of lowering (to e or o) or deletion, depending on the phonological environment.

Lightner's analysis does indeed capture the systematic alternations which these vowels exhibit, but it does so within the

limitations of a linear model of representation. Within the SPE framework, underlying feature distinctions were the only means available for representing phonological distinctions. With the development of autosegmental phonology, new possibilities become available. Phonological distinctions can be captured by the geometry of the representation, rather than simply through features.

Spencer (1986) was the first to propose an autosegmental treatment of the yers. In re-examining work of Gussmann (1980) and Rubach (1984) on Polish, Spencer argues that the distinction between yers and the vowels e and o is not segmental, but rather structural. Appealing to Archangeli's (1984) theory of underspecification, he posits segmentally unspecified V-slots as the underlying representation of yers in Polish and formulates a cyclic rule of e-insertion on the segmental plane, with the final V extrametrical.³

In their analysis of syllabic nuclei in Slovak, a West Slavic language, Kenstowicz and Rubach (KR) (1987) propose a somewhat different analysis of the yers within the three-dimensional model of phonological representation. They propose that yers are underlyingly represented only on the segmental plane, with no link to an X-slot in the skeleton. This analysis assumes that, in terms of their segmental representation, yers are indistinguishable from non-alternating e and o.⁴

Given this analysis, KR formulate the rule of yer-vocalization given in (4). A circled V stands for a vocalic segment which is unassociated with the skeleton.

(4) Yer-Vocalization (VOC)

$$\begin{array}{c} \textcircled{V} \text{---> } V / \text{---} C \textcircled{V} \\ | \\ X \end{array}$$

A number of consequences follow from their analysis. For example, they argue that the underlying vowel inventory of Slovak is highly symmetric, exhibiting pairs of long and short vowels, front and back, at each of the three heights. Yers, however, stand apart from other vowels in failing to exhibit long-short oppositions. The autosegmental analysis explains this, since yers are not linked to any X-slot in their underlying representation.

The KR analysis also explains why the Slovak Rhythmic Law treats yers differently from other vowels. This law, first formulated by Jakobson (1939), belongs to the class of shortening rules in Slovak. Very simply, the rule shortens a long vowel when it is immediately preceded by a syllable containing a long vowel. Compare the two sets of Slovak nouns in (5). In these examples, the accute accent mark indicates a long vowel, rather than stress.

(5) Slovak Nouns Exhibiting the Slovak Rhythmic Law

<u>NOM SG</u>	<u>GEN PL</u>	<u>LOC PL</u>	
záhrad+a	záhrad+ø	záhrad+ách	'garden'
písm+o	písem+ø	písm+ach	'letter'

The loc pl inflection has an underlying long vowel. In the first example, the rule of shortening fails to apply because another vowel intervenes between the long vowels of the root and inflection. In the second example, we can see that the stem contains a yer. However, this vowel does not block the rule. This is easily explained on the assumption that the yer is not linked to the skeleton at the stage in which the shortening rule applies.

There is an striking connection between what is going on in these Slovak nouns and what is going on in the Russian adjectives cited in (3). In Slovak, an intervening vowel blocks the Rhythmic Rule from applying. However, the yers uniquely fail to block the rule. In Russian, syllabic suffixes trigger the BAP. However, certain suffixes whose only vowels are yers--En and Ok-- fail to trigger the BAP.

Pursuing this observation, suppose that we adopt KR's analysis and postulate the same representation for yers in Russian. In the next section I will show that this approach to the yers solves the problem of mobile stress in adjectives derived with the suffixes En and Ok, and it does so in a way that is consistent with the analysis of stress presented in the previous chapter.

2.4 A Floating Feature Segment in Russian

I have assumed that stress assignment is carried out on a separate stress plane. Since only vowels are stressable elements in Russian, only vowels are projected onto that plane. Following KR, suppose we assume that yers are represented underlyingly only on the segmental plane, thus in essence comprising only a set of floating features.

We know that only vowels are stressable elements in Russian. In the autosegmental framework I am adopting, a vowel is defined not by a feature [\pm vocalic], but rather structurally, by an association between a skeletal position and a syllable nucleus. From this it follows that if a yer is not linked to a syllable nucleus at the point at which the stress rule applies, then it will not be visible to the stress rule. Let us pursue this idea, adopting the term Φ -yer to refer to a segment which is underlyingly represented as a set of features on the segmental plane which are not linked to the skeleton.

We know from our investigation of stress in athematic verbs, that a nonsyllabic suffix does not trigger the BAP (see Chap.1, Sect. 6). The past tense morpheme l does not trigger the stress rule. This explains why mobile stress occurs in the past tense of athematic verbs, despite the fact that these verbs forms consist of three morphemes. When the root is unaccented, stress will fall on the f agreement suffix,

which is accented; since the other agreement suffixes are unaccented, the default clause of the BAP assigns stress to the initial vowel (e.g. Ži+l+á 'she lived'; Ži+l+o 'it lived'; Ži+l+i 'they lived'). Even though the forms contain three morphemes, there are only two cycles for the stress rule. A morpheme which contains no other vowel than one which is underlyingly represented as a set of floating features on the segmental plane will be treated by the BAP in exactly the same way.

To see how this analysis works, consider first an adjective derived with the suffix En: xolodn+á (f), xóloden+ø (m), xólodn+y (pl) 'cold'. The root is [xolod], which is unaccented. This morpheme will have the (somewhat simplified) formal representation shown in (6).

(6) Representation of the Unaccented Root Morpheme [xolod]

(a)

STRESS PLANE:		*		*	
SKELETON:	X	X	X	X	X
SEGMENTAL PLANE:	x	o	l	o	d

I assume that the skeleton is simply a series of timing slots. Each autosegmental plane is independently linked to the skeleton, thus defining what is actually an autonomous plane. The entire representation, then, should be thought of as a set of intersecting planes. The phonetic content of each skeletal slot is specified on the segmental plane. Throughout most of the discussion, I will simply use

phonemic symbols, rather than features, to designate the contents of this plane.

Following Levin (1985), I dispense with the feature \pm vocalic, and assume that vocalic status derives from the projection of a vocalic nucleus from the skeleton onto the syllable plane.

As I discussed in Chap. 1, the stress plane contains hierarchically organized sequences of elements. Each element associated with a syllable nucleus is represented on the stress plane. These elements constitute the bottom line (Line 0) of the grid. Those vowels which are accented (whether lexically or by the BAP during the course of the derivation) are marked with an asterisk on Line 1. Since the root morpheme xolod is unaccented, it will have no Line 1 asterisk in its underlying representation.

Let us suppose that the adjectival suffix En is represented as in (7).

(7) Underlying Representation of the Adjectival Suffix En

X
|
e n

Implicit in this representation is the assumption that a Φ -yer which has the feature [-back] and which undergoes systematic vowel-zero alternations, is segmentally identical to the front, mid vowel which exhibits no such alternation.

The feminine agreement suffix is represented as in (8). Since it is accented, a column of two asterisks appears on the stress plane.

(8) Representation of the Feminine Agreement Suffix

L1	*
L0	*
	X
	a

Now let us examine a derivation of xolodná (f) 'cold'. I will adopt the rule of Vocalization given in (4), thus eliminating the earlier rule of Lower. Furthermore, we can dispense with the rule of Yer-Deletion. The vowel fails to vocalize not because its features are eliminated, but because there is no association line between its feature specification on the segmental plane and the skeleton.

(9) Derivation

xolodná (f) 'cold'

UR: [[[xolod] En] a]

	L1	
	L0	* *
<u>CYCLE 1</u>		[XXXXX]
		xolod
BAP		SCC

```

      L1
      L0  *  *
          |  |
CYCLE 2  [[XXXXX] X]
          ||||| |
          xolod en

```

BAP SCC

```

      L1
      L0  *  *      *
          |  |      |
CYCLE 3  [[XXXXX X] X]
          ||||| |  |
          xoloden a

```

BAP

```

      L1
      L0  (*  *      *)
          |  |      |
          [[XXXXX X] X]
          ||||| |  |
          xoloden a

```

VOC N.A.

xolodná

The first cycle consists of an unaccented root. Therefore, on the stress plane, there are only Line 0 asterisks representing the vowels of this morpheme. The BAP fails to apply due to the SCC.

On the second cycle, the suffix En enters the derivation. This suffix is not visible to the BAP, however. E is underlyingly represented as a set of floating features (i.e. [-cons, -back, -hi, -lo]). Since the suffix contains no segment which is underlyingly linked to a syllable nucleus, it is not represented on the stress plane. Consequently, for the stress rule, affixation of this suffix does not constitute a derived

environment. Hence, the BAP is again blocked by the SCC. However, I will present evidence later on to show that this suffix does trigger cyclic rules on the segmental plane.

On the third and final cycle, the agreement suffix is introduced. This suffix is syllabic and thus triggers the BAP. Since the inflectional vowel a is the only accented vowel in the word, the BAP constructs an unbounded, right-headed metrical constituent with this vowel as head. This constituent extends over the entire word, and stress surfaces on the accented vowel a. Note as well that the rule of Vocalization does not apply because there is no sequence of floating features. Therefore the yer in En does not vocalize in this form.

Now consider the plural form of this adjective, xólodn+y. The agreement suffix in this instance is unaccented. Since the word contains no lexically accented morpheme, the BAP assigns an accent to the initial vowel. That accented vowel thus becomes the head of an unbounded, righthanded constituent which, in this instance, is the smallest possible domain: a single vowel. The Exhaustivity Condition requires iterative footing on Line 0 (see Chap. 1, Sect. 4). Therefore, another constituent is constructed over the remaining elements, with the final vowel designated as head of the second constituent (because the parameter in Russian is set at [-Bounded, +Head-Terminal, R-Headed]). The derivation is given below, beginning with the third cycle.⁵

(10) Derivation

xólodny (pl) 'cold'

UR: [[[xolod] En] y]

	L1			
	L0	*	*	*
<u>CYCLE 3</u>		[[XXXXX X]	X]	X]
		xoloden	y	

BAP

L2	*		
L1	(*		*)
L0	(* *		*)
	[[XXXXX X]	X]	X]
	xoloden	y	

----> CONFLATION

L1	*		
L0	(*)*		*
	[[XXXXX X]	X]	X]
	xoloden	y	

VOC

N.A.

xólodny

I have assumed that the vowel in the suffix En is segmentally identical to a nonalternating e, its features being [-cons, -hi, -lo, -bk]. We cannot observe this directly in f and pl forms, since the vowel doesn't surface. However, in the m form it does appear. This is because the m agreement suffix is itself a yer, and thus the conditions for Vocalization are met, resulting in the form xóloden. I will have more to say about this form below, but first I want to make one more point about the suffix En.

Looking back at the set of adjectives given in (3), which are derived with En, we find one further piece of evidence for postulating

an underlying front vowel in this suffix. Notice that in three of the examples the root-final consonant undergoes mutation. These examples are repeated in (11), along with a related form in which the underlying velar consonant does not undergo palatalization.

(11)

<u>ROOT</u>	<u>NOUN</u>	<u>ADJECTIVE</u>	
		<u>F</u>	<u>M</u>
mrak	mrak (m) 'darkness'	mračn+á	mráčēn+ø 'gloomy'
drug	drug (m) 'friend'	družn+á	drúžēn+ø 'friendly'
dux	duxotá (f) 'stuffiness'	dušn+á	dúšēn+ø 'stuffy'

The three velar consonants become coronals in the derived adjectives. Recall that in Chap. 1, I introduced a rule which palatalizes velar consonants before a front vowel or glide (VEL PAL). A descriptive formulation of this rule is repeated in (12).

(12) Velar Palatalization Rule

VEL PAL: {k,g,x} ----> {č,ž,š} / ____ [-cons, -bk]

Because this rule does not apply morpheme internally, I assume that it is cyclic and applies only in derived environments.⁶ To account for velar-palatal alternations in forms like those in (11), we must assume that a front vowel immediately follows the root-final velar consonant. Even though this vowel is "inert" as far as the (mid) vowel (ö). We have no direct evidence for this claim, since the agreement suffix is always word-final and thus the yer in this position is never eligible to undergo Vocalization. However, there is indirect evidence in the fact that stem-final velar consonants do not undergo palatalization

in the m form (e.g. stróg (m) 'strict'; tíx (m) 'quiet'; dík (m) 'wild').⁷ Nothing crucial in my analysis hinges on the particular choice of front or back vowel in this suffix, however, for the condition on Vocalization is structural rather than segmental.

The autosegmental representation implies that the m agreement suffix 0 will be invisible to the BAP in the same way that the adjectival suffix En was. This is because the vowel is not linked to the skeleton and therefore it is not represented on the stress plane. We know, however, that this word is stressed. Therefore, we must assume that the BAP applies not only cyclically, but at the post-cyclic stage of the derivation as well. (We will encounter additional evidence for this assumption later on.)

The derivation of xóloden is given in (13). I begin with the third cycle. Note that, as a result of the rule of Vocalization applying on the third cycle, the vowel e is represented for the first time on the stress plane at the post-cyclic stage of the derivation. I have simplified the derivation by including Conflation as part of the BAP.

(13) Derivation

xóloden (m) 'cold'

UR: [[[xolod] En] 0]

L1
 L0 * *
 | |
CYCLE 3 [[XXXXX X]]
 ||||| |
 xoloden o

BAP SCC

VOC N
 |
 X
 |
 e --> e

L1
 L0 * * *
 | | |
POST-CYCLIC [XXXXXXXX]
 |||||
 xolodeno

L1 (*)
 L0 (*)* *
 | | |
 BAP [XXXXXXXX]
 |||||
 xolodeno

xóloden

Given that Vocalization is a cyclic rule, the e in the adjectival suffix will associate with the skeleton on the third cycle and automatically project onto the stress plane. The word contains no lexically accented vowel. Therefore, the BAP assigns an accent to the initial vowel, and constructs right-headed, unbounded feet on Line 0.

The accented initial vowel will itself constitute a foot. Conflation will eliminate all but the leftmost constituent on Line 0. Hence, stress will surface on the initial vowel.

Another adjectival derivational suffix which behaves like En is Ok. We expect forms derived with this suffix to have the following properties: (i) if the root is unaccented, the word will have mobile stress; (ii) the yer will vocalize only in the m form; and (iii) Velar Palatalization should not apply before this suffix, since it is specified [-bk]. The examples in (3), repeated below, verify that each of these predictions is true.

(14) Adjectives Derived with the Suffix Ok

<u>ROOT</u>	<u>DERIVED ADJECTIVE</u>			
	<u>F</u>	<u>M</u>	<u>PL</u>	
gib	gibk+á	gíbok+ø	gíbki	'pliant'
mel	melk+á	mélok+ø	mélki	'petty'
krep	krepk+á	krépok+ø	krépk+i	'strong'
leg	legk+á	légok+ø	légki	'light'
korot	korotk+á	kórotok+ø	kórotki	'short'

2.4.1 The Adjectival Suffix l

There is a third set of derived adjectives with mobile stress. These are formed with the suffix l. Examples are given in (15). Notice the absence of vowel-zero alternations in these forms.

(15) Adjectives Derived with the Suffix l

<u>ROOT</u>	<u>DERIVED ADJECTIVE</u>			
	<u>F</u>	<u>M</u>	<u>PL</u>	
dr'ab	dr'abl+á	dr'ábl+ø	dr'ábl+i	'flabby'
pod	podl+á	pódl+ø	pódl+i	'mean'
poš	pošl+á	póšl+ø	póšl+i	'vulgar'
smug	smugl+á	smúgl+ø	smúgl+i	'dark-complexioned'
krug	krugl+á	krúgl+ø	krúgl+i	'round'
tusk	tuskl+á	túskl+ø	túskl+i	'dull'
tux	tuxl+á	túxl+ø	túxl+i	'rotten'

In contrast to the two adjectival suffixes En and Ok, I will assume that this suffix has no underlying vowel. This explains why the yer does not vocalize in the m forms.^a

2.4.2 Summary

I began this section by presenting counterexamples to my prediction that only nonderived words can have mobile stress. The evidence consisted of short form adjectives derived from the suffixes En and Ok. The fact that both suffixes contain yers turned out to be of crucial importance.

Following Kenstowicz and Rubach's (1987) analysis of yers in Slovak, I proposed to treat these suffixal yers in Russian as floating features on the segmental plane. Because they are not linked to the skeleton in their underlyingly representation, and are not associated with a nucleus on the syllable plane, they are not represented on the stress plane. Therefore, these vowels are not visible to the BAP, which

applies on the stress plane. This means that affixation of these suffixes does not create a derived environment for the stress rule. Consequently, the Strict Cycle Condition prevents application of the BAP on the cycle comprising these suffixes. The suffixes En and Ok fail to trigger the BAP for the same reason that the nonsyllabic past tense suffix l and the nonsyllabic adjectival suffix l fail to do so. Thus, we have a principled explanation for the occurrence of mobile stress in these derived adjectives.

The Nonderived Word Generalization must be re-stated as follows:

(16) Revised Nonderived Word Generalization

Mobile stress can only occur in words with monomorphemic stems or stems derived with suffixes which are underlyingly nonsyllabic.⁹

2.5 A Segmentally Unspecified Syllabic Yer

2.5.1 Introduction

The analysis presented in the previous section leads to the following prediction: if the stem of a noun, short form adjective, or past tense verb consists of an unaccented root and a derivational suffix containing a yer, it not only can, but it must exhibit mobile stress. This prediction turns out to be too strong. In this section we will

examine a class of nouns which we would expect to have mobile stress, but do not. To incorporate these data into my analysis, I will propose an extension of the autosegmental analysis of the yers, postulating a vowel which is underlyingly represented on the syllable and stress planes, but not on the segmental plane.

We are going to return to the nominal system and examine a set of nouns derived from the suffix Estv.¹⁰ The vowel in this suffix does not exhibit paradigmatic vowel-zero alternations. Instead, in some words, the vowel appears in all inflected forms, while in others it never surfaces. This suffix attaches primarily to nominal stems, and to some adjectival stems as well. The derived nouns are 1st declension neuter nouns with an abstract or collective meaning. The question of the underlying representation of this morpheme will be the central issue here.

In the first part of the discussion, the only point about the stress properties of these nouns that is crucial to the analysis is the fact that stress is always fixed. It is important that the reader keep this in mind. What particular vowel gets stress will be treated as a separate issue. In order not to divert our attention from the main point, I will put aside for the moment the problem of stress assignment in these nouns.

2.5.2 Data

First consider the data in (17). In all these examples the suffix appears without a vowel (stv).

(17) Nouns Derived with the Suffix Estv in which the Suffixal Vowel Never Surfaces

<u>BASE NOUN OR ADJECTIVE</u>	<u>DERIVED NOUN</u>		
	<u>NOM SG</u>	<u>GEN PL</u>	
zloděj (m) (A) 'villain'	zlodějstv+o	zlodějstv+ø	'evil deed'
brát (m) (A) 'brother'	brátstv+o	brátstv+ø	'brotherhood'
soséd (m) (A) 'neighbor'	sosédstv+o	sosédstv+ø	'neighborhood'
zver' (m) (C) 'wild animal'	zvérvstv+o	zvérvstv+ø	'brutality'
lékar' (m) (A or C) (pejor) 'physician'	lekárstv+o	lekárstv+ø	'drug'
sxodn+á, sxódn+y (C) 'similar'	sxódstv+o	sxódstv+ø	'likeness'

The derived nouns in (17) have fixed stress, even when the root is unaccented (i.e. the base noun or adjective belongs to stress Class C). This tells us that the derivational suffix must trigger the BAP. If it triggers the BAP, then it must have an underlying vowel which is projected onto the stress plane. However, in the examples above, there is no evidence of such a vowel. Furthermore, notice that Vocalization does not apply in the stem in the gen pl form. This must be due to a property of the stem suffix, rather than the inflection, for the gen pl inflection does generally trigger Vocalization, as we have already seen. Examples are shown in (18).

(18) Evidence that Gen Pl Inflectional Yer Triggers Vocalization

<u>NOM SG</u>	<u>GEN PL</u>	
okn+ó	ókon+φ	(n) 'window'
pis'm+ó	písem+φ	(n) 'letter'
ovc+á	ovéc+φ	(f) 'sheep'
kúkl+a	kúkol+φ	(f) 'doll'
svád'ba	svádeb+φ	(f) 'wedding'

These examples support an analysis in which the gen pl inflection is represented as a set of floating features on the segmental plane (i.e. [-cons, -bk, -hi, -lo]).

The evidence, then, is conflicting. In most words derived with this suffix, there is no segmental evidence of a vowel. But the fact that these derived nouns have fixed stress tells us that the BAP is treating this as a syllabic suffix. What we are confronting here is a problem which is exactly the opposite of what we encountered in the previous section. Forms which we predict will have mobile stress turn out to have fixed stress.

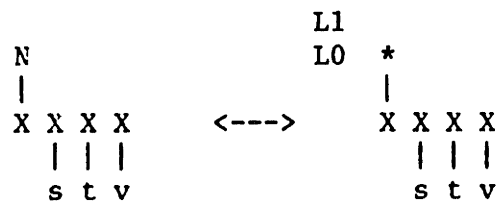
2.5.3 Metrical and Segmental Evidence

Suppose we assume that the derivational suffix does have an underlying vowel. The problem then is to explain its failure to surface in a large number of nouns derived with this suffix. We can do this by postulating a second type of abstract vowel (i.e. a yer) in Russian. The data in (17) tell us that this vowel has at least the following two properties: (i) it participates in the metrical phonology; and (ii) it

is not subject to the rule of Vocalization. An autosegmental analysis can capture exactly these properties. What we need to assume is that there is a vowel which is segmentally unspecified. It is simply a syllable nucleus which is linked to a timing slot in the skeleton and, by virtue of its status as a syllable nucleus, it is represented on the stress plane.

According to this analysis, the suffix Estv will have the underlying representation given in (19). In order to show both the syllable and stress planes, I give two separate representations, both of which include the skeleton and segmental plane. The bidirectional arrow is used to indicate that they are two aspects of the same underlying representation. Let us refer to the abstract vowel represented below as an X-yer. (The question of why a vowel does surface in certain forms will be taken up next.)

(19) Underlying Representation of the Suffix Estv



Notice that this representation allows for the possibility that this abstract vowel is underlyingly accented.¹¹ However, I will assume that it is unaccented. Evidence for this will be given later on.

Before examining a derivation, let us review the rule of Vocalization (Voc). This is a cyclic rule which associates a floating feature segment (i.e. a Φ -yer) to the skeleton if it is followed by a floating feature segment. The rule is given below.

(20) Rule of Vocalization

$$\textcircled{V} \rightarrow \begin{array}{c} x \\ | \\ v \end{array} / \text{ ___ } (c) \textcircled{V}$$

Association with the skeleton results in the projection of a syllable nucleus on the syllable plane.

Now let us turn to the derivation of zvérstvo 'brutality', given in (21). I will continue to assume that the vowel in the suffix Estv is accented.

(21) Derivation

zvérstvo (nom sg) 'brutality'

UR: [[[zver] Estv] o]

	L1	
	L0	*
<u>CYCLE 1</u>		[XXXX]
		zver

BAP SCC

	L1		
	L0	*	*
<u>CYCLE 2</u>		[[XXXX]	XXXX]
		zver	stv

BAP	L2	*	----	CONFLATION	
	L1	(*) (*)		L1	*
	L0	(*) (*)		L0	(*) *
		[[XXXX] XXXX]			[[XXXX] XXXX]
		zver stv			zver stv
	L1	*			
	L0	(*)* *			
<u>CYCLE 3</u>		[[XXXXXXXX] X]			
		zver stv o			
BAP	L2	*	----	CONFLATION	
	L1	(*) (*)		L1	*
	L0	(*)* *		L0	(*)* *
		[[XXXXXXXX] X]			[[XXXXXXXX] X]
		zver stv o			zver stv o
				VOC	N.A.
					zvérstvo

On the second cycle, the BAP applies. There is no accented element on the stress plane. The BAP assigns an accent to the initial vowel and constructs unbounded, right-headed feet on Line 0 (i.e. in this instance, two feet, each of which comprises one element). Conflation eliminates the second foot. On the third cycle, an unaccented inflection appears. Application of the BAP and Conflation result in the preservation of only the leftmost foot on Line 0. Therefore, stress falls on the initial syllable.

In the table of examples in (17), I included the gen pl forms along with the nom sg. I did this in order to show that the rule of Vocalization does not apply in these words, even when the inflection is itself a yer. The important point is that in most words derived with the suffix Estv, the underlying vowel of the stem suffix never surfaces. Moreover, even when no other derivational suffix is present, these nouns always have fixed stress.

The fact that vowel-zero alternations do not occur in the inflectional paradigm of words derived with this suffix, shows that the rule of Vocalization does not apply to this suffix. Having posited a segmentally unspecified vowel in the suffix Estv, this is what we expect. Vocalization is a rule which applies on the segmental plane, associating a set of floating features to the skeleton. For the rule to apply on a given cycle, there must be a sequence of floating feature matrices on the segmental plane.

2.5.3.1 Default Features

By extending the autosegmental analysis of yers, we have succeeded in explaining both the stress properties of words derived with the suffix Estv and the failure of the suffixal vowel to surface in examples like those (17). The data, however, are more complicated than what has been presented thus far. There are words derived with this suffix in which the vowel e appears in the stem in all forms of the

inflectional paradigm. Examples are given in (22). Notice that consonant mutations occur in some of the derived forms.

(22) Nouns Derived with the Suffix Estv in which the Suffixal Vowel Surfaces in All Forms

<u>BASE NOUN OR ADJECTIVE</u>	<u>DERIVED NOUN</u>	
	<u>NOM SG</u>	<u>GEN SG</u>
čudák (m) (B) 'eccentric'	čudáčestv+o	čudáčestv+a 'eccentricity' ¹²
drug (m) (C) 'friend'	drůžestv+o	drůžestv+a 'friendship'
pastůx (m) (B) 'shepherd'	pastůš ^v estv+o	pastůš ^v estv+a 'occupation of a shepherd'
stárec (m) (A) 'old man'	stárčestv+o	stárčestv+a 'old age'
muž (m) (C) 'husband; man'	můžestv+o	můžestv+a 'courage'
sv'atóša (f) (A) 'sanctimonious person'	sv'atóšestv+o	sv'atóšestv+a 'sanctimonious behavior'
óbšij (A) 'common'	óbščestv+o	óbščestv+a 'society'

These data raise two problems:

1. Why does the vowel e appear in all forms?
2. If the segmentally unspecified vowel of the suffix Estv is accented and surfaces (as e), why does stress never fall on this suffixal vowel?

Let us begin with the first question. In the derived forms in (22), the consonant preceding the vowel e which surfaces in the suffix Estv is a strident palatal. In some instances, the palatal consonant is underlying, while in others (i.e. the first three examples) it appears to be derived by the rule of Velar Palatalization. Recall that this rule palatalizes velars before a front vowel or glide (i.e. (k->č, g->ž, x->š^v). I argued earlier that this rule is cyclic. Consequently, in

order for this rule to apply correctly in these words, on the second cycle there must be an element represented on the segmental plane which is specified [-back].

I will assume that the default features for a vowel in Russian are [-bk, -hi, -lo]. (We will see further evidence for this later on). In addition, I will posit a cyclic rule which inserts these features on the segmental plane, as well as an association line linking them to the empty skeletal slot, when the preceding segment is [-anterior]. This accounts for the presence of the vowel e in the suffix Estv after the following set of consonants: k, g, x, č, ž, š, šč, and c.¹³ Insertion of the features for the vowel e will in turn trigger Velar Palatalization and another rule which changes c to a strident palatal (c→č).¹⁴

Returning to the question of the accentual status of the X-yer in Estv, note that in (22) stress never surfaces on this vowel, even when it vocalizes. In particular, note that the derived nouns múžestvo 'courage' and drúžestvo 'friendship', both of which have unaccented roots, have stress on the initial syllable. This is additional evidence that the segmentally unspecified vowel in this suffix is unaccented.¹⁵

2.5.4 Further Evidence for an X-Yer

Let us review the arguments given thus far for positing a segmentally unspecified vowel in the underlying inventory of Russian. First, I provided evidence that the suffix Estv triggers the BAP, even

when no suffixal vowel surfaces. Nouns derived with this suffix never have mobile stress, even if the root is unaccented (e.g. zvérstvo 'drug'). We have already seen that nonsyllabic suffixes do not trigger the stress rule. Therefore, the suffix Estv must have a vowel which is segmentally unspecified but nevertheless represented on the stress plane and thus visible to the BAP.

Second, we have seen that this suffix does not exhibit paradigmatic vowel-zero alternations. The vowel is either present in all inflectional forms (due to default feature insertion) or absent in all inflectional forms. In particular, Vocalization does not apply in the gen pl form, where the inflection is itself a segmentally specified yer (i.e. a Φ -yer).

There is another prediction which follows from my analysis. If a morpheme containing a yer whose segmental content is specified but unlinked to the skeleton (e.g. a Φ -yer) immediately precedes the suffix Estv, that yer will not vocalize. In other words, the vowel in the suffix Estv, an X-yer, should both fail to trigger and fail to undergo Vocalization. The evidence supports this prediction.

Consider, for example, a set of words derived with the suffix Ec.¹⁶ This suffix creates masculine nouns from nominal, adjectival, and verbal stems, which refer to a type of person. These nouns exhibit the vowel-zero alternations characteristic of yers. When the suffix Estv is

added to the stems of these words, the vowel in Ec fails to surface in all forms of the newly derived noun.

Examples are given in (23). For the base noun, I cite both the nom and gen sg, to show that the suffix Ec undergoes vowel-zero alternations. The nom sg form verifies that the suffixal yer undergoes Vocalization. (Recall that I have assumed that the 1st declension nom sg inflection is a Φ -yer.) One form is sufficient to show that this same yer does not surface when embedded in a stem ending in the suffix Estv.

(23)

<u>BASE NOUN</u> (stem + <u>Ec</u> + infl)		<u>NOUN DERIVED WITH Estv</u> (stem + <u>Ec</u> + <u>Estv</u> + infl)	
<u>NOM SG</u>	<u>GEN SG</u>	<u>NOM SG</u>	
mladénec+ Φ	mladénc+a 'infant'	mladénčestv+o	'infancy'
skopéc+ Φ	skopc+á 'eunuch'	skópčestv+o	'condition of being a eunuch'
tvoréc+ Φ	tvorc+á 'creator'	tvórčestv+o	'creation'
povstánec+ Φ	povstánc+a 'insurrectionist'	povstánčestv+o	'rebellious action'
stárec+ Φ	stárc+a 'old man'	stárčestv+o	'old age'
poražénec+ Φ	poražénc+a 'defeatist'	poražénčestv+o	'defeatism'
uprošćenec+ Φ	uproščénc+a 'oversimplifier'	uproščénčestv+o	'over- simplification'

The segmental processes which affect these forms are illustrated below, in a derivation of mladénčestvo 'infancy'. Since I am ignoring stress for the time being, I will omit the stress plane. Instead, I will include the syllable plane, but show only the syllable nuclei. I abbreviate the rule which inserts the default features [-cons, -hi, -bk] as $\Phi \rightarrow e$.

(24) Derivation

mladenčestvo (nom sg) 'infancy'

UR: [[[[mladen] Ec] Estv] o]

```

      N N
      | |
CYCLE 2 [ [XXXXXX]  X]
      |||||  |
      mladen ec

```

VOC **N.A.**

```

      N N      N
      | |      |
CYCLE 3  {[XXXXXX X] XXXX}
      ||||| |   |||
      mladenec   stv

```

VOC N.A.

```

      N N      N
      | |      |
    { [xxxxxx X] xxxx }
      ||||| |  ||||
    φ->e      mladenec      estv
    c->ĉ      ĉ

```

	N	N	N	N
CYCLE 4	[{	}	X]
	m	l	a	d
	e	n	e	č
	ě	s	t	v
				o

VOC N.A.

mladénčestvo

There are some exceptions. That is, there are words in which a *y*er in the syllable preceding the suffix *Estv* does vocalize, contrary to our expectation. In particular, it is interesting to note the following doublet: (i) *ótčestvo* 'patronymic' and (ii) *otéčestvo* 'fatherland'.

These are both derived from the noun otéc+φ (nom sg) ~ otc+á (gen sg) 'father'. (i) is the predicted form, with the yer in the root morpheme not vocalizing, while (ii) is the exception. Two other exceptions are nouns containing the suffix Ec in the stem: molodéc+φ ~ molodc+á 'fine fellow' ----> molodéčestv+o 'spirit, dash' (the predicted form is *molódčestvo) and kupéc+φ ~ kupc+á 'merchant' ----> kupéčestv+o (collect.) 'the merchants' (the predicted form is (*kúpčestvo)). For now I will account for these simply by assuming that they are subject to a special lexically-determined rule of Vocalization.

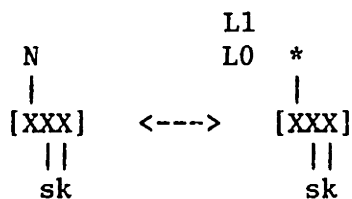
Another suffix with precisely the same properties as Estv is the productive adjectival suffix Esk. This suffix attaches to nominal stems to form relational adjectives. Examples are given in (25). These adjectives occur only in long form, and I have used the m nom sg as the citation form. The data are divided into three parts. Parts (i) and (ii) illustrate the conditions under which the suffixal vowel is either absent or present. In addition, certain forms in (ii) show that Velar Palatalization applies when the vowel is present. Part (iii) shows that the suffix fails to trigger Vocalization in a preceding suffix. Several of the examples given below are derived from the same base noun as the examples given earlier which were derived with Estv ((17), (22), (23)).

(25) Adjectives Derives with the Suffix Esk

BASE NOUN		DERIVED ADJECTIVE	
NOM SG	DAT PL	NOM SG, M	
(i)			
zloděj+φ	zloděj+am (m) 'villain'	zlodějsk+ij	'villainous'
brát+φ	brát'+am (m) 'brother'	brátsk+ij	'brotherly'
soséd+φ	soséd+am (m) 'neighbor'	sosédsk+ij	'neighbor's'
xolóp+φ	xolóp+am (m) 'lackey'	xolópsk+ij	'servile'
člén+φ	člén+am (m) 'member'	člénsk+ij	'member's'
(ii)			
můž+φ	muž+ám (m) 'man'	můžesk+ij	'masculine'
vrág+φ	vrag+ám (m) 'enemy'	vrážesk+ij	'enemy'
jaz'k+φ	jazyk+ám (m) 'language'	jaz'česk+ij	'heathen'
pastux+φ	pastux+ám (m) 'shepherd'	pastúšesk+ij	'shepherd's'
(iii)			
tvoréc+φ	tvorc+ám (m) 'creator'	tvórčesk+ij	'creative'
stárec+φ	stárc+am (m) 'old man'	stárčesk+ij	'old man's'
mladénec+φ	mladénc+a (m) 'baby'	mladénčesk+ij	'infantile'

I assume that this suffix has a segmentally unspecified vowel (i.e. an X-yer). Its underlying representation is given below. I also assume that it is unaccented.

(26) Underlying Representation of the Adjectival Suffix Esk



The default features [-hi, -bk] are inserted under the conditions given earlier, namely after [-ant] consonants.

Again, we find some exceptions. These exceptions fall into three groups. One set consists of forms with stems ending in a velar consonant in which the suffixal vowel does not surface. Most of these are proper names. Examples are given below.

(27) Exceptions: Failure of a Velar Consonant to Palatalize

<u>BASE</u>	<u>EXPECTED</u>	<u>OCCURRING</u>
gércog 'duke'	*gércožeskij	gércogskij ¹⁷
peterbúrg	*peterbúržeskij	peterbúrgskij
uzbék	*uzbéčeskij	uzbékskij
irák	*iráčeskij	irákskij
kazák	*kazášeskij	kazáxskij

Another set shows unexpected vocalization of a Φ -yer in the base stem. Most of these examples are based on stems that showed the same type of exceptional behavior in nouns derived with Estv, discussed above.

(28) Exceptions: Unexpected Vocalization of a Φ -Yer in the Stem

<u>NOM SG</u>	<u>BASE</u>	<u>GEN SG</u>	<u>EXPECTED</u>	<u>OCCURRING</u>
kupéc+ ϕ		kupc+á 'merchant'	*kúpčeskij	kupéčeskij
otéc+ ϕ		otc+á 'father'	ótčeskij	ótčeskij & otéčeskij ¹⁸

The third group of exceptions is characterized by three properties: (i) the base stem ends in an unvoiced velar or palatal consonant; (ii) the adjectival suffix appears without a vowel; and (iii) the adjectival suffix surfaces as ck, rather than sk. Examples are given in (29). (In last three, I include two forms of the base noun to show

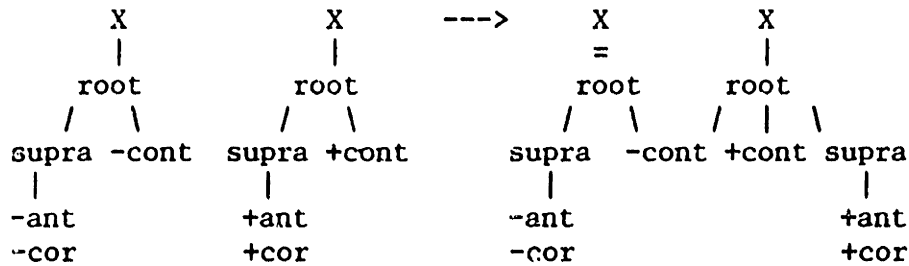
that the stem undergoes vowel-zero alternations and thus contains a yer.)

(29) Exceptions: Adjectival Suffix Surfaces as ck(ij)

<u>BASE</u>	<u>EXPECTED</u>	<u>OCCURRING</u>
<u>NOM SG</u>		
durák 'fool'	*duráčeskij	duráckij
slovák 'slovak'	*slováčeskij	slováckij
mužík 'Russian peasant'	*mužičeskij	mužickij
morják 'sailor'	*morjáčeskij	morjáckij
tkáč 'weaver'	*tkáčeskij	tkáckij
čtéc 'reader'	*čtéčeskij	čtéckij
lovéc/lovcá 'fisherman'	*lówčeskij	lovéckij
molodéc/molodcá 'fine fellow'	*molódčeskij	molodéckij
piséc/piscá 'scribe'	*písčeskij	piséckij

These forms are marked as exceptions for the rule inserting default features ($\phi \rightarrow \underline{e}$). In those forms which are derived from a stem ending in a velar, affixation of the suffix Esk results in the following consonant sequence on the segmental plane: ksk. Following Sagey's (1986) analysis of affricates as contour segments, which assumes a hierarchical organization of segmental features, we can account for the c in these forms by assuming a merger between these two consonants. The association line linking the segmental representation of k to the skeleton is severed, and the class feature [continuant] associates to the root node of the following consonant, s. This is shown below, in a somewhat simplified representation.

(30)



2.5.5 Summary

In this section I argued that in Russian there are vowels which are segmentally unspecified in their underlying representation. I refer to this type of vowel as an X-yer. Since it is represented on the stress plane, a suffix containing an X-yer will trigger the BAP. However, because the X-yer lacks specification on the segmental plane, it is neither subject to Vocalization nor can it trigger Vocalization. By positing this type of vowel, we are able to account for both the segmental and metrical behavior of words derived with the nominal suffix Estv and the adjectival suffix Esk.

The X-yer is maximally distinct from a Φ -yer, which has only a segmental specification. A Φ -yer both triggers and undergoes Vocalization. However, because its underlying representation does not include association to a syllable nucleus, it is not represented on the stress plane. Thus, it does not trigger the BAP.

2.6 A Third Type of Yer

So far we have seen evidence for two types of yers. Their properties are summarized in (31).

(31)

(i) Φ -yer

- (a) represented only on the segmental plane
- (b) triggers and undergoes Vocalization
- (c) triggers Velar Palatalization
- (d) cannot be lexically accented, since it has no underlying representation on the stress plane
- (e) suffixes containing this vowel do not trigger the BAP

(ii) X-yer

- (a) represented as an X-slot on the skeleton which is linked to a syllable nucleus and thus is represented on the syllable and stress planes
- (b) neither triggers nor undergoes Vocalization
- (c) does not trigger Velar Palatalization
- (d) can be lexically accented
- (e) suffixes containing this vowel trigger the BAP

There is evidence of yet a third type of abstract vowel in Russian. This vowel exhibits the metrical behavior of an X-yer and the segmental behavior of a Φ -yer. Its properties are summarized below:

1. it both triggers and undergoes Vocalization
2. it triggers Velar Palatalization
3. it can be lexically accented
4. it triggers the BAP

Let us call this vowel a ΦX-yer, since it combines the properties of both a Φ-yer and an X-yer. Given the autosegmental framework which I have adopted, such a vowel would have to have the representation shown in (32). (Recall that I use the symbol Φ to denote the features [-cons, -hi, -lo, ±bk].) The stress plane is omitted in this representation.

(32) Underlying Representation of a ΦX-Yer

SYLLABLE PLANE:	N
SKELETON:	X
SEGMENTAL PLANE:	Φ

What is distinctive about this hypothetical vowel is that, although it is fully specified on the segmental and syllable planes, the planes are not linked in the underlying representation. The theory of autosegmental phonology does not rule out this possibility. However, it is important to note that the representation in (32) implies that association lines have the status of independent entities in the theory.

There is indeed evidence in Russian of a vowel of exactly this type. One source of evidence comes from nouns derived with the nominal diminutive suffix Ek. This suffix derives nouns of all three genders.

Examples of m diminutive nouns are given in (33). The derived forms all have the meaning 'little x', where "x" is the base noun.

(33) Masculine Nouns Derived with the Diminutive Suffix Ek

BASE NOUN		DERIVED NOUN	
<u>NOM SG</u>	<u>DAT PL</u>	<u>NOM SG</u>	<u>DAT PL</u>
(i)			
xólod+φ	xolod+ám (C) 'spell of cold weather'	xolodók+φ	xolodk+ám
pógreb+φ	pogreb+ám (C) 'cellar'	pogrebók+φ	pogrebk+ám
górod+φ	gorod+ám (C) 'city'	gorodók+φ	gorodk+ám
(ii)			
léd+φ	l'd+ám (A) 'ice'	ledók+φ	ledk+ám
véter+φ	vétr+am (A) 'wind'	veterók+φ	veterk+ám
kostér+φ	kostr+ám (B) 'campfire'	kosterók+φ	kosterk+ám
(iii)			
béreg+φ	bereg+ám (C) 'shore'	berežók+φ	berežk+ám
durák+φ	durak+ám (B) 'fool'	duračók+φ	duračk+ám
sméx+φ	sméx+am (A) 'laugh'	smešók+φ	smešk+ám

The examples under (i) have unaccented stems, as shown by the mobile stress pattern of the base noun. Since the derived forms do not have mobile stress, we know that this suffix triggers the BAP.

It is clear from the two derived forms cited in each example that the yer in this derivational suffix undergoes Vocalization. The forms in (ii) demonstrate, in addition, that the suffix triggers Vocalization of a yer in the stem.

The forms in (iii) show that this suffixal vowel triggers Velar Palatalization. Since we know that palatalization processes occur before a front vowel or glide, let us assume that the vowel in this suffix is underlyingly specified [-bk]. There is a late rule which backs a mid front vowel when the following consonant is hard, i.e. nonpalatalized.

I will assume, then, that there is a third type of yer in Russian. This vowel is segmentally specified and it is represented on the syllable and stress planes. However, there is no underlying link between the segmental plane and the skeleton. I have adopted the term Φ X-yer to refer to this vowel.

2.6.1 The Accentual Property of the Diminutive Suffix Ek

Let us turn now to the question of the accentual property of the diminutive suffix Ek. All of the derived nouns in (33) are post-accenting (Class B), regardless of the accentual property of the base stem. This shows that an accent on a base stem (i.e. base nouns of Class A & B) is always eliminated. From this we can infer that the vowel of the diminutive suffix is accented and, furthermore, that the suffix is dominant and post-accenting.

In order to demonstrate how my analysis of the yers interacts with stress assignment and the segmental phonology, I will present derivations of the dat pl and nom sg forms of the diminutive noun veterók 'breeze'. The related nonderived noun, véter 'wind', exhibits a vowel-zero alternation (véter (nom sg), vétram (dat pl)) and has fixed stress. A discussion of the derivation is included at the end of each cycle. Recall that dominance is a property of a suffix which I represent by the subscript d.¹⁹ I use the subscript p as a feature identifying a suffix as post-accenting.

(34) Derivations

(i) veterkám (dat pl) 'breeze'

UR: [[[veter] Ek] am]

	L1	*
	L0	*
<u>CYCLE 1</u>	[XXX X]	
	veter	

BAP SCC

DISCUSSION: The root morpheme contains a Φ -yer, as well as a full vowel. We know that the initial vowel is accented, because the nonderived noun véter 'wind' has fixed stress. The Strict Cycle Condition prevents the BAP from applying on the first cycle.

	L1	*	*		L1	*
	L0	*	*		L0	*
<u>CYCLE 2</u>	[[XXX X]	XX]	_{d/p}	---->	[[XXX X]	XX]
	veter	ek			veter	ek

	L1	*
	L0	(* *)
BAP	[[XXX X]	XX]
	veter	ek

	L1	*
	L0	(* * *)
VOC	[[XXXXX]	XX]
	veter	ek

DISCUSSION: The second cycle introduces the dominant, accented diminutive suffix Ek. Like most dominant suffixes, Ek is post-accenting. This suffix contains a Φ X-yer. It is specified [-back]. Affixation of the dominant suffix eliminates the accent of the base stem. The BAP applies. Since the suffixal vowel is accented, it marks the righthand boundary of an unbounded metrical foot. Next, the rule of Vocalization applies. Although the yers belonging to the root and suffix are structurally different, they both have floating segmental features, thus satisfying the conditions for this rule. The Φ -yer in the root-final syllable is associated to an inserted X-slot and represented on the syllable and stress planes.

CYCLE 3

L1	(*)	*
L0	(* * *)	*
	[[XXXXXXXX] _p	XX]
	veterek	am

BAP

---> CONFLATION

L2	(*)
L1	(* *)
L0	(* * *) (*)
	[[XXXXXXXX] _p XX]
	veterek am

L1	*
L0	(* * *) *
	[[XXXXYXX] _p XX]
	veterek am

VOC

N.A.

DISCUSSION: The third cycle introduces the dat pl inflectional suffix, which is accented. Since this suffix is not dominant (i.e. it is not accent-deleting), previous assigned metrical structure remains intact. The accented vowel of the inflection forms a metrical foot. The two Line 1 elements form an unbounded, left-headed constituent, and the head is marked on Line 2. Since Russian has no secondary stress, Lines 1 and 2 are conflated. Any constituent on Line 0 left without a head is then dissolved, with the result that only the leftmost constituent on Line 1 is preserved. Thus, stress surfaces on the leftmost accented syllable. Vocalization does not apply because there is no sequence of floating features present on the third cycle.

The segmental content of the Φ X-yer in the diminutive suffix fails to associate with skeleton. Therefore, the vowel simply fails to vocalize.

```

      L1      *
      L0  (* * *)*
          | | | |
POST-CYCLIC [XXXXXXXXX]p
          ||||| |||
          veterekam

```

*->

```

      L1      *
      L0  (* * * *)
          | | | |
          [XXXXXXXXX]
          ||||| |||
          veterekam

```

veterkám

DISCUSSION: The post-accenting property of the suffix percolates to become a property of the word. Since the accent is on the penultimate vowel. Post-Accentuation applies, transferring the accent to the final vowel. Formally, this means that the metrical constituent is expanded by one element, acquiring a new head.

(ii) veterók (nom sg)

UR: [[[veter] Ek] 0]

Note: Since the first two cycles are identical in the dat pl and nom sg, I begin this derivation on cycle 3.

```

      L1      *
      L0  (* * *)
          | | |
CYCLE 3  [[XXXXXXXX]P ]
          ||||| |
          veterék  o

```

BAP	SCC
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
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87	87
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89	89
90	90
91	91
92	92
93	93
94	94
95	95
96	96
97	97
98	98
99	99
100	100

VOC

$$\begin{array}{ccc} \text{N} & & \text{N} \\ | & & | \\ \text{X} & \longrightarrow & \text{X} \\ | & & | \\ \text{e} & & \text{e} \end{array}$$

```

L1      *
L0 (* * *)
    | | |
    [[XXXXXXXX]p ]
    |||||
    veterék o

```

DISCUSSION: The stem contains a Φ X- γ er, while the nom sg inflectional suffix is a Φ - γ er. The suffix Ek is accented, dominant, and post-accenting. The vowel representing the inflectional suffix consists only of a set of floating features on the segmental plane. Therefore, it is not represented on the stress plane. Consequently, it does not trigger the BAP.

Vocalization applies to the stem yer (a Φ X-yer) because affixation of the inflection results in a sequence of two floating feature matrices on the segmental plane. Since this vowel is the head of the Line 0 constituent, it surfaces with stress. The inflectional yer does not undergo Vocalization and hence does not surface. Nevertheless, we infer that it is present underlyingly from the fact that Vocalization applies to the stem yer.

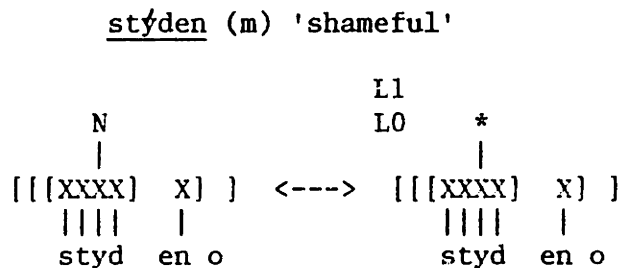
	L1	*
	L0	(* * *)
<u>POST-CYCLIC</u>	[XXXXXXX]	▷
	vetereko	
 *->	 N.A.	
 <u>e->o</u>	 o	
	 <u>veterók</u>	

DISCUSSION: Post-Accentuation cannot apply, because there is no position on the stress plane which the the Line 1 asterisk can move to.

My assumption that the 1st declension nom sg inflection is a Φ -yer has an important implication. It means that, from the standpoint of the BAP, in the nom sg, nonderived nouns of the 1st declension are consist of only one cycle. Unless we allow the stress rule to apply post-cyclically as well, the Strict Cycle Condition will prevent the BAP from applying to these forms and they will surface without stress.

Recall that I argued earlier, based on data presented in Sect. 3, that the BAP applies both cyclically and post-cyclically. The data involved *m* short form adjectives derived with the suffixes En and Ok. These forms contain only one underlyingly syllabic morpheme, which is the root. Thus, consider for example the adjective stydn+á (f), stydn+i (pl), styden+ø (m) 'shameful'. The *m* form is composed of the following morphemes, all of which are unaccented: Root: [styd] + [En] + [O]. The word has the following underlying representation:

(35)



Since the two suffixes have no representation on the syllable or stress planes, they are not visible to the BAP. Therefore, the BAP must be allowed to apply once more at the post-cyclic stage of the derivation.

2.6.2 The Feminine Diminutive Suffix Ek

There is another diminutive suffix Ek which forms *f* nouns of the second declension. In terms of its structural and segmental properties, this suffix is identical to the *m* diminutive suffix. However, in contrast to the latter, it is neither dominant nor post-accenting, but

is simply accented. The data in (36) show that it has all the properties we expect of a suffix containing a yer which is represented on both the stress and segmental planes, but with no underlying link between the segmental plane and skeleton: (i) it triggers the BAP; (ii) the vowel undergoes and triggers Vocalization (unlike the suffixes Estv and Esk); and (iii) the vowel causes palatalization of a preceding velar consonant.

There is one problematic aspect of these data, however. Notice that in words derived from unaccented roots (i.e. the base noun is Class C, meaning that it has mobile stress), in the gen pl forms stress falls on the vowel immediately preceding the suffix. We would expect it to fall on the vowel of the diminutive suffix. I will have more to say about this later on.

(36) Second Declension F Nouns Derived with the Diminutive Suffix Ek

BASE NOUN				DERIVED NOUN			
NOM SG		GEN PL		NOM SG		GEN PL	
(i)	kómnat+a	kómnat+ø	(f) (A) 'room'	kómnatk+a	kómnatok+ø		
(ii)	kníg+a	kníg+ø	(f) (A) 'book'	knížk+a	knížok+ø		
(iii)	drák+a	drák+ø	(f) (A) 'fight'	dráčk+a	dráčok+ø		
(iv)	múx+a	múx+ø	(f) (A) 'fly'	múšk+a	múšok+ø		
(v)	kórob+ø	korob+óv	(m) (C) 'box'	koróbk+a	koróbok+ø		
(vi)	svád'b+a	svádeb+ø	(f) (A) 'wedding'	svádebk+a	svádebok+ø		
(vii)	polos+á	polós+ø	(f) (C) ²⁰ 'stripe'	polósk+a	polósok+ø		
(viii)	lošad'+ø	lošad'+éj	(f) (C) 'horse'	lošádk+a	lošádok+ø		

The derived forms in example (i) simply show that the suffix exhibits paradigmatic vowel-zero alternations. Examples (ii)-(iv) show that Velar Palatalization applies before this suffixal vowel. This tells

us that the vowel is specified [-bk]. The vowel surfaces as o due to a late rule which backs a mid vowel before nonpalatalized consonants. The stem of the base noun in example (vi) contains a yer. The derived forms show that the suffixal vowel not only undergoes Vocalization, but triggers it as well. And finally, examples (v), (vi), and (viii) testify to the fact that the suffix is accented: the base nouns have mobile stress, while the derived nouns have fixed stress.

Let us pursue the problem of stress assignment in the derived nouns whose roots are unaccented ((v), (vii), (viii)). Given my assumption that the derivational suffix is accented, we expect that in these cases the accent of the derivational suffix will "win". The accent will subsequently move to the adjacent vowel on the left when the accented suffixal yer fails to vocalize. This leftward movement of the accent is due to the fact that metrical constituents in Russian are right-headed, and the suffixal vowel constitutes the head in these cases. We then predict that stress will surface on the vowel immediately preceding this suffix. The nom sg forms support this prediction (as do all other forms where the inflection is not a yer). The problem is the gen pl, where the inflection is a yer. In this case, the yer in the stem vocalizes and thus we predict that stress will remain on the accented vowel of the suffix. In fact, it moves to the left exactly as it does when the yer fails to vocalize.

One immediate solution is to say that the gen pl forms are subject to the rule of Retraction. Though it works technically, this solution is unappealing. Nowhere else do we see Retraction applying to one form of an inflectional paradigm. For the time being I will have to leave the problem of stress assignment in the gen pl form of these nouns unresolved.

2.6.3 The Suffix Ec

Now let us turn to the third and final suffix which I will present as an example of a morpheme containing a ØX-yer. This is the nominal suffix Ec, which forms 1st declension masculine nouns from nominal, adjectival, and verbal stems. Examples are given in (37).

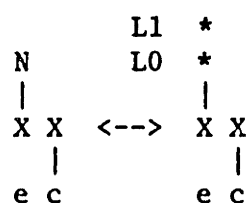
(37) Nouns Derived with the Suffix Ec

BASE ADJECTIVE			DERIVED NOUN	
<u>F</u>	<u>PL</u>	<u>M</u>	<u>NOM SG</u>	<u>DAT PL</u>
(a) xrabr+á	xrábr+i	xrábr+ø (C)	xrabréct+ø	xrabrc+ám
		'brave'		'brave person'
(b) živ+á	živ+i	živ+ø (C)	živéc+ø	živc+ám
		'alive'		'live bait'
(c) molod+á	mólod+i	mólod+ø (C)	molodéc+ø	molodc+ám
		'young'		'fine fellow'
(d) lukáv+a	lukáv+i	lukáv+ø (A)	lukávec+ø	lukávc+ám
		'crafty'		'sly person'

BASE NOUN		DERIVED NOUN	
NOM SG	DAT PL	NOM SG	DAT PL
(e) búben+ø	búbnt+am (A) 'tambourine'	búbenec+ø	búbenc+am 'little bell'
(f) kovčég+ø	kovčég+am (A) 'ark'; (obs.: 'box')	kovčéžec+ø	kovčéžc+am 'a small box or chest'
(g) vólk+ø	volk+ám (C) 'wolf'	volčéc+ø	volčc+ám 'thistle' ²¹

Examples (a)-(c), and (g) demonstrate that the vowel in this suffix is accented. Note that it is also post-accenting. Examples (d), (e), and (f) show that the suffix is not dominant. The nom sg forms of the derived nouns show that the suffixal yer undergoes Vocalization, while example (e) shows that it triggers Vocalization. Finally, the last two examples both provide evidence that the suffixal yer triggers Velar Palatalization. These properties are captured by the representation in (38).

(38) Representation of the Nominal Suffix Ec



A derivation of the nom sg of búbenec 'tambourine' is given below.

(39) Derivation

búbenec (nom sg) 'tambourine'

UR: [[[bubEn] Ec] 0]

L1 *
 L0 *
 |
CYCLE 1 [XXX X]
 | | | |
 buben

BAP SCC

L1 * *
 L0 * *
 | |
CYCLE 2 [[XXX X] XX] _p
 | | | | |
 buben ec

BAP

----> CONFLATION

L2 *
 L1 (* *)
 L0 (* *)
 | |
 [[XXX X] XX] _p
 | | | | |
 buben ec

L1 *
 L0 (*) *
 | |
 [[XXX X] XX] _p
 | | | | |
 buben ec

VOC

L1 *
 L0 (*)* *
 | | |
 [[XXXXX] XX]
 | | | | |
 buben ec

```

      L1  *
      L0 (*)* *
          | | |
CYCLE 3 [[XXXXXXX]p ]
          | | | | |
          bubenec  o

```

BAP SCC

VOC

```

      L1  *
      L0 (*)* *
          | | |
      [[XXXXXXX]p ]
          | | | | |
          bubenec  o

```

búbenec

NOTE: (Post-Accentuation does not apply post-cyclically since it is not the penultimate vowel which is accented)

There is a diminutive form of búbenec, which is derived with the suffix ik. This suffix does not contain a yer. Thus, as expected, the yer in the suffix Ec fails to vocalize in all forms of the word búbenčik.²² A derivation is given below. I have simplified the derivation by including Conflation as part of the BAP.

(40) Derivation

```

      L1  *      *
      L0  *      *
          |      |
CYCLE 2  [{XXX X} XX]p
          ||| |  |
          buben  ec
  
```

BAP

---> CONFLATION

```

      L2  *
      L1  (*      *)
      L0  (*      *)
          |      |
          [{XXX X} XX]p
          ||| |  |
          buben  ec
  
```

```

      L1  *
      L0  (*      *)
          |      |
          [{XXX X} XX]p
          ||| |  |
          buben  ec
  
```

VOC

```

      L1  *
      L0  (*)*    *
          |  |    |
          [{XXXXX} XX]p
          |||| |  |
          buben  ec
  
```

```

      L1  *
      L0  (*)* *   *
          |  |  |   |
CYCLE 3  [{XXXXXXXX}p XX]
          |||| |  ||
          bubenec  ik
  
```

BAP

---> CONFLATION

```

      L2  *
      L1  (*      *)
      L0  (*|* *   *)
          |  |  |   |
          [{XXXXXXXX}p XX]
          |||| |  ||
          bubenec  ik
  
```

```

      L1  *
      L0  (*)* *   *
          |  |  |   |
          [{XXXXXXXX}p XX]
          |||| |  ||
          bubenec  ik
  
```

VOC

N.A.

```

      L1  *
      L0 (*)* * *
          | | | |
CYCLE 4  [[XXXXXXXXX]p ]
          ||||| |||
          bubenecik . o

```

BAP SCC

VOC N.A.

```

      L1  *
      L0 (*)* * *
          | | | |
POST-CYCLIC  [XXXXXXXXX ]p
          ||||| |||
          bubeneciko

```

*-> N.A.

VOC N.A.

c->č č
 búbenčik

2.7 Summary

In Chapter 1 I argued that mobile stress can only occur in nonderived words. I began this chapter by pointing out certain exceptions to this generalization. The exceptions, namely adjectives derived with the suffixes En and Ok, have in common that they exhibit vowel-zero alternations.

Vowel-zero alternations are common in Russian, and I provided evidence to show that these alternations cannot be the result of epenthesis. Instead, they reflect the presence of abstract vowels in the underlying vowel inventory of Russian. These abstract vowels are the modern reflexes of the yers, a pair of high, lax vowels which we know to have occurred historically in Slavic. Although high, lax vowels never surface in modern Slavic, there is evidence that they continue to play a role in the phonological systems of Slavic languages.

I have argued that in modern Russian there are three distinct abstract vowels. Because these vowels regularly surface as mid vowels (front and back), I assume that they are segmentally identical to nonalternating e or o. What distinguishes among the three yers on one hand, and between the yers and the underlying vowels e and o on the other hand, is their underlying structural configuration. These are given in (41), along with the underlying representation of the nonalternating mid vowel.

(41) Underlying Representations of the Yers in Russian

	<u>Φ-yer</u>	<u>X-yer</u>	<u>ΦX-yer</u>	<u>e/o</u>
SYLLABLE PLANE		N	N	N
SKELETON		X	X	X
SEGMENTAL PLANE	-cons		-cons	-cons
	-hi		-hi	-hi
	-lo		-lo	-lo
	‡back		‡back	‡back

I observed that vowels which exhibit vowel-zero alternations vary in their segmental and metrical properties. For example, the two which are segmentally specified trigger the rule of Vocalization, while the two which are underlyingly syllabic trigger the BAP. These facts, summarized below, are what we expect, given the differences in their underlying structure.

(42) Segmental and Metrical Properties of the Yers

	<u>Φ-Yer</u>	<u>X-Yer</u>	<u>ΦX-Yer</u>
BAP:	-	+	+
VOC:	+	-	+

This analysis of the yers enables us to account for the fact that mobile stress occurs in certain derived words. If a stem is derived with a suffix containing a Φ-yer (e.g. the adjectival suffixes En and Ok), then the suffix will have no representation on the syllable or stress planes. This means that the cycle which introduces that suffix will introduce no new material on the stress plane. Consequently, the Strict Cycle Condition will block application of the BAP. This explains our observation that suffixes containing a Φ-yer behave metrically like suffixes consisting only of a consonant. My analysis shows that the same suffix may trigger cyclic rules on one level of representation but fail to do so on another level.

Notes: Chapter 2

1. I will use the symbol Φ to represent the features [-cons, -hi, -lo, \pm bk].
2. The underlying vowel of the inflection is y. There is a rule which fronts a high, back vowel after velar consonants.
3. We will see later on that this analysis cannot account for the properties of underlying yers in Russian.
4. Anderson (1982) proposes a similar solution for French schwa-zero alternations.
5. Recall that, due to space constrictions, the symbol | is sometimes used instead of)(to mark a boundary between two constituents. Thus, for example, the representation (* * *|* * *) is equivalent to (* * *)(* * *).
6. The following examples show that the rule of Velar Palatalization does not apply morpheme internally: xítr+ij 'cunning' (root: xítr); xérit (coll) 'to cross out' (root: xer); kísnut 'to turn sour' (root: kís).

kis); kém (instr form of kto) 'who'; gíbel 'destruction' (root: gib); and géttry 'gaiters' (root: getr).

7. Velar Palatalization also fails to occur in the plural, before the front vowel i (e.g. stróg+i (pl) 'strict'; tíx+i (pl) 'quiet'; dík+i (pl) 'wild'). However, this vowel is underlyingly y, which is [+back]. A late rule, applying after VEL PAL, fronts this vowel after velars.

8. I found three forms which do exhibit vowel-zero alternations: (i) kisl+á, kísel+ø 'sour'; (ii) tepl+á, tépel+ø 'warm'; (iii) svetl+á, svétel+ø 'bright'. In the first two examples, we can assume that the root morphemes contain a yer and that the l itself is part of the root. In other words, these would be nonderived adjectives. In the case of (iii), however, this analysis will not work, because the adjective is clearly derived from the noun svet, 'light'. One is then forced to say that the e in svétel is epenthetic. This is curious, given that other obstruent + l clusters are tolerated in word-final position in adjectives.

9. I emphasize the condition underlyingly nonsyllabic. When the conditions for Vocalization are met, a yer is linked to a syllable nucleus and thus is represented on the stress plane. This process distinguishes a suffix which contains a yer from one which consists only of a consonant.

10. I continue to use capital E and O to denote a yer, i.e. a vowel which is not fully specified in its underlying representation. However, keep in mind that the particular properties of the vowel represented by E and O may differ.

11. The representation I proposed earlier for the yers, in which they are segmental features unlinked to the skeleton, predicts that Φ -yers cannot be underlyingly accented.

12. Recall that in Chapter. 1, I argued that Post-Accentuation generally applies only at the periphery of a word, i.e. when the post-accenting suffix is stem-final. This example, a Class B noun, is another illustration of this condition.

13. There are two words which appear to violate this selectional restriction: bégstvo 'escape' and gércogstvo 'duchy'. Because their roots end in a velar, we would expect the forms *bézestvo and *gércožestvo.

14. Another consonant alternation exhibited in the examples in (22) is c ~ č (e.g. stárec --> stárčestvo). There is another process affecting velar consonants in Slavic which was discovered by Baudouin de Courtenay (1894) (cited in Chomsky and Halle (1968)). The process is very complicated. However, it essentially involves velar consonants changing

into dentals when preceded by a high, front vowel. Lightner assumes that this rule (BdC) is present in the phonology of modern Russian. He notes, for example, the pair of related nominal suffixes ik (m) and ica (f), and argues that both have the underlying form ik, with the feminine form marked to undergo this rule (e.g. k->c / [-bk, +hi]___). Other examples of related words exhibiting a velar-dental alternation include the following (from Lightner, p. 145):

- (i) vosklík+nut' (pf) - vosklic+át' (impf) 'to exclaim'
- (ii) ób+lik (m) 'appearance' - lic+ó (n) 'face'
- (iii) ot+torg+át' 'to tear away' - terz+át' 'to tear to pieces'
- (iv) kn'ag+ínja (f) 'princess' - kn'az' (m) 'prince'

On the basis of these data, Lightner argues that the underlying form of the suffix ec is πk, where π = a vowel specified [+hi, -lo, -tns] (i.e. a yer in Lightner's system). According to his analysis, the rule BdC would apply morpheme internally in the noun stárec, while the rule of Velar Palatalization would apply instead in the form starčestvo, changing k to č.

A thorough discussion of the problem of the underlying form of the consonant c in the suffix Ec and the status of the rule BdC in modern Russian is beyond the scope of this paper. Given that the suffix Ec never exhibits a k~c alternation, I will assume that c is the underlying consonant and adopt the rule c->č/ ___ [-bk].

15. My analysis predicts that words derived with this suffix will always have stress on the stem. However, there is a small number of words

derived with this suffix which have stress fixed on the inflection.

Examples include: volšebstvó 'magic' (cf. volšébnij 'magical'); vdovstvó 'widow' (cf. vdóvij 'widowed'); motovstvó 'wastefulness' (cf. motovskój 'wasteful'); roždestvó 'Christmas' (cf. rožénije 'birth'); and božestvó 'deity' (cf. bog 'god'). Clearly the stem in these instances is post-accenting.

It is interesting to note that all of the examples have in common that they contain no other derivational suffix besides Estv.

16. I will have more to say about the properties of the suffix Ec in the following section. For the time being, the reader is asked to ignore the issue of stress assignment in the forms presented. What is crucial here is that the suffix exhibits regular paradigmatic vowel-zero alternations. This tells us two things: (i) it has underlying segmental features and (ii) the features are not underlyingly linked to the skeleton.

17. Recall that the derived noun was also exceptional: gércogstvo.

18. Recall that we found the same related pair in nouns derived with Estv.

19. Dominance has to be thought of as a property of a suffix, rather than of an accent. As we saw in Chapter 1, an unaccented suffix can be dominant.

20. To verify that the noun belongs to Class C, note that the nom pl is pólos+y. The acc sg has both alternants: pólos+u and polos+ú. Recall that I argued in Chapter 1 I argued that this inflection has both accented and unaccented allomorphs.

21. Given the dubious semantic relation between the base noun and derived noun, one might question whether the root of this derived noun is actually [volk]. I think there is reason to believe that it is. The adjectival form of volk 'wolf' is vólčij. The Oxford Dictionary cites the phrase vólč'ja jágoda (lit: 'wolf berry') as referring to the plant "spurge-flax".

22. As noted earlier, the consonant c patterns with velars for certain processes. Thus c becomes a strident palatal (č) before a front vowel or glide.

Chapter 3

ADJECTIVAL STRESS

3.1 Introduction

Adjectives in Russian fall into two types: (i) the long form and (ii) the short form. Long form adjectives can function either as attributes or as predicates, while short form adjectives always have a predicative role. As a general rule, qualitative adjectives can occur in either long or short form. Relative adjectives, on the other hand, can occur only in long form.

Short form adjectives were mentioned in chapters 2 and 3. The reader will recall that these forms have the following number and gender agreement markers: a (fem), o (neut), o (masc), y (pl).¹ Long form adjectives are fully declined, agreeing with the noun they qualify in number, gender, and case.²

In this chapter we will examine the full range of short and long form stress patterns. There are, in particular, three sets of facts which my theory must explain:

1. Nonderived short-form adjectives exhibit five different stress patterns. This is more than we would expect, given previously adopted assumptions about the accentual classes of root morphemes and the accentual properties of short-form adjectival suffixes.
2. Long form adjectives exhibit only two stress patterns, both characterized by fixed stress. In other words, there is an absence of mobile stress in the long form.
3. Adjectives which share the same stress pattern in the short form may exhibit different stress patterns in long form. This is puzzling for the following reason: if two adjectives have the same short-form stress, that indicates that their roots have the same accentual property. If their roots have the same accentual property, then we predict that they will exhibit the same stress in the long form as well.

The purpose of this chapter is to show that my analysis handles the full array of facts described above.

In addition, I will show that my analysis accounts for the particular location of stress in derived adjectives, with one

modification. Based on data from the nominal system, I argued in Chapter 1 that post-accentuation applies only when a post-accenting (i.e. Class B) suffix is stem-final. We will see that this condition is violated in the adjectival system, requiring a stipulation that post-accentuation can apply before certain adjectival derivational suffixes.

Finally, I will discuss a large set of long form adjectives whose stress properties vary in ways that are not predicted by my analysis. These are the adjectives derived with the suffix ov.³ In Section xx, I lay out the relevant data, showing why it is problematic for my analysis, but also pointing out certain generalizations. We will see that, although the data are extensive, it is not possible to draw any firm conclusions from them about the accentual property of the suffix ov. Thus, although the data in this section may be of interest to specialists in Russian morphology and phonology, the discussion contributes little to the main theoretical issues of this study. The reader who does not have a special interest in Russian may want to skim this section.

3.2 Short Form Adjectival Stress

Short form adjectives exhibit the same three major types of stress patterns found in the nouns:

Class A: Fixed stress on the stem

Example: bogát+a, bogát+ø, bogát+o, bogát+y 'rich'

Class B: Fixed stress on the inflection

Example: zdorov+á, zdoróv+ø, zdorov+ó, zdorov+y' (coll) 'robust'

Class C: Mobile Stress

Example: molod+á, mólod+ø, mólod+o, mólod+y 'young'

Each of these patterns is accounted for if we assume that those with fixed stress on the stem have accented stems; those with fixed stress on the inflection have post-accenting stems; and those with mobile stress have unaccented stems.

There are, in addition, two other less common stress patterns found among short form adjectives. One pattern is characterized by stress on the inflection in the f and pl, on the initial vowel in the m and n. In other words, it differs from Class C stress only in the pl, with stress falling on the inflection rather than the initial vowel.⁴ Anticipating my analysis of these cases as a secondary type of mobile stress. I will label this pattern Class C'.⁵ It is interesting to note that, according to Zaliznjak (1977), every adjective which permits this stress pattern also permits regular Class C stress. In other words, there is a subset of Class C adjectives which allows stress to fall either on the inflection or on the initial vowel in the plural short form. Examples are given in (1). I have noted the regular Class C pl stress in parentheses.

(1) Class C' Short Form Adjectival Stress

<u>F</u>	<u>M</u>	<u>N</u>	<u>PL</u>	
mil+á	míl+ø	míl+o	mil+y' (míl+y)	'nice'
važn+á	vážen+ø	vážn+o	važn+y' (vážn+y)	'important'
bedn+á	béden+ø	bédn+o	bedn+y' (bédn+y)	'poor'
rezk+á	rézok+ø	rézk+o	rezk+i' (rézk+i)	'sharp'
nizk+á	nízok+ø	nízk+o	nizk+i' (nízk+i)	'low'
vesel+á	vésel+ø	vésel+o	vesel+y' (vésel+y)	'merry'

Adjectives exhibiting this stress pattern, just like those with regular Class C stress, have unaccented stems. The alternative stress in the pl form can be explained by postulating two alternants of the pl agreement marker: one which is accented and one which is unaccented.⁶ If the agreement suffix is accented, it gets the stress; if it is unaccented, the default clause of the BAP assigns stress to the initial vowel of the adjective.

Just like adjectives with regular Class C stress, only nonderived adjectives or adjectives derived with an underlying nonsyllabic suffix (e.g. En and Ok) exhibit this stress pattern. This fact supports an analysis of these adjectives as having unaccented stems (i.e. belonging to Class C). As I argued in Chapters 1, this is because only stems which are either monomorphemic or composed of a root and nonsyllabic derivational suffix can be unaccented going into the inflectional cycle, thus allowing the accentual property of the inflectional suffix to determine whether stress will fall on the inflection or initial vowel in a given form of the paradigm.

This analysis of Class C' short form adjectives raises an interesting question, however. If the plural agreement marker has both accented and unaccented alternants, why don't all short form adjectives with unaccented stems allow either initial or final stress in the plural form? We have to assume that the two alternants of this inflectional suffix do not have equal status, the exceptional form being the one which is accented. Which adjectival stems permit the accented alternant is totally idiosyncratic and thus must be included as part of their lexical entry.

The fifth and final short form adjectival stress pattern which we need to consider is also characterized by optional stress assignment, but in two forms rather than just one. In this case, stress is always on the inflection in the f and on the stem-final vowel in the m (unless the stem-final vowel is a yer, in which case it can be on a pre-stem-final vowel). In both the n and pl, it may be either on the inflection or on the stem-final vowel. I will refer to this pattern as Class B', since I will argue that adjectives with this stress pattern are a subset of those with post-accenting stems. Examples are given in (2). I have noted in parentheses the regular Class B stress in the n and pl.

(2) Class B' Short Form Adjectival Stress

(i)	^F be ^l +á	^M be ^l +ø	^N be ^l +o (be ^l +ó)	^{PL} be ^l +y (be ^l +ý) 'white'
(ii)	želt+á	žolt+ø	žélt+o (žolt+ó)	žélt+y (žolt+ý) 'yellow'
(iii)	pestr+á	p'óstr+ø	p'óstr+o (pestr+ó)	p'óstr+y (pestr+ý) 'variegated'
(iv)	krasn+á	krásen+ø	krásn+o (krasn+ó)	krásn+y (krasn+ý) 'red'
(v)	uzk+á	úzk+ø	úzk+o (uzk+ó)	úzk+i (uzk+í) 'narrow'
(vi)	glubok+á	glubók+ø	glubók+o (glubok+ó)	glubók+i (glubok+í) 'deep'
(vii)	širok+á	širók+ø	širók+o (širok+ó)	širók+i (širok+í) 'wide'
(viii)	vysok+á	vysók+ø	vysók+o (vysok+ó)	vysók+i (vysok+í) 'tall'

Notice, first of all, the limited range of meanings associated with adjectives exhibiting this stress pattern. They refer either to color or size.⁷ This is the only instance we have seen in which stress is predictable from some other independent property of a word.

Since all adjectives which take this stress pattern also allow regular Class B stress, I will assume that their stems are post-accenting and that retraction optionally in the n and pl.⁸

Let me summarize my analysis of short form adjectival stress. There are four short form agreement markers: a (f), o (m), o (n), and y

(pl). Of these, a is accented, while the others are unaccented. y does, however, have an exceptional accented form which is associated with a subset of unaccented stems.

There are three primary patterns of short form adjectival stress. I have analyzed these as follows: (i) adjectives with stress fixed on the stem have accented stems (Class A); (ii) those with stress fixed on the inflection have post-accenting stems (Class B); and (iii) those with mobile stress have unaccented stems (Class C).

I noted two additional, less common stress patterns. Each of these is a variation on one of the primary stress patterns. One is a variation of the mobile pattern, with stress falling on the inflection in both the plural and feminine forms, otherwise on the initial vowel. Adjectives exhibiting this stress pattern I classified as Class C', indicating that they are a subset of Class C adjectives (i.e. their stems are unaccented). The other pattern is a variation of the Class B (i.e. post-accenting) type of stress. In the n and pl, retraction applies, resulting in stress on the stem.

3.3 Stress in Nonderived Long Form Adjectives

Long form adjectives agree with the noun they modify in number, gender, and case. In the m and n singular, all inflections are the same

except in the nom, while the f sg has its own set of endings. There is only one set of plural inflections. A table of long form adjectival inflections is given below.⁹

(3) Long Form Adjectival Inflections

	(M & N)	(F)	
	<u>S</u>	<u>S</u>	<u>PL</u>
NOM	oj/oe	a [̄] ja	yje
GEN	ovo	oj	yx
DAT	omy	oj	ym
ACC	oj/oe/ovo	uju	yje/yx ¹⁰
INSTR	ym	oj	ymi
LOC	om	oj	yx

Only two types of stress are found among nonderived long form adjectives: stress is fixed either on the stem or on the inflection. An example of each is given in (4).

(4) Stress Patterns of Long Form Adjectives

(i) **Fixed stress on the stem**

Example: bogát+a[̄]ja (f, nom sg)
 bogát+yj (m, nom sg)¹¹
 bogát+o[̄]je (n, nom sg)
 bogát+yje (nom pl)

(ii) **Fixed stress on the inflection**

Example: molod+á[̄]ja (f, nom sg)
 molod+ó[̄]j (m, nom sg)
 molod+ó[̄]je (n, nom sg)
 molod+yje (nom pl)

To account for this, let us assume that all long form adjectival inflections are accented. This leads to the prediction that adjectives with unaccented roots and adjectives with post-accenting roots will both have stress fixed on the inflection in the long form. In the case of

unaccented roots, this will be due to the lexical accent on the inflectional suffix. In the case of post-accenting roots, this will result from the accent of the root morpheme being transferred to the inflection. Adjectives with accented roots will have stress fixed on the stem (i.e the root in nonderived forms). I will present evidence in the next section to show that these predictions are correct.

3.4 Co-Occurring Patterns of Short and Long Form Stress

In order to verify the predictions formulated in the previous section, we must examine both the short and long form stress patterns associated with a given adjective. Since the distinction between Class B and C stems is lost in the long form, we must rely on the short form stress pattern to determine the accentual property of a given adjectival stem.¹² Before we examine the data, let us review what correspondences we should expect to find between short and long form stress patterns, given the simplest set of assumptions.

If an adjective has stress fixed on the stem in the short form, then we assume it belongs to Class A, having an accented stem. We then predict that it will have stress fixed on the stem in the long form as well. If an adjective has stress fixed on the inflection in the short form, we assume it belongs to Class B, having a post-accenting stem. We

predict that it will have stress fixed on the inflection in the long form. If an adjective has mobile stress in the short form, we can assume that it belongs to Class C, having an unaccented stem. And, given my assumption that all long form adjectival inflections are accented, we expect that it will have stress fixed on the inflection in the long form. These predictions are summarized in (5).

(5) Predicted Relations Between Short and Long Form Adjectival Stress Patterns

<u>SHORT FORM</u>		<u>LONG FORM</u>
fixed on stem	---->	fixed on stem
fixed on inflection	---->	fixed on inflection
mobile	---->	fixed on inflection

These predictions are supported by the data in (6). (I have cited the f and n short forms, and the three nom sg long forms for each adjective).

(6) Correspondences Between Short and Long Form Adjectival Stress Patterns

<u>SHORT FORM</u>			<u>LONG FORM</u>		
(i) <u>Class A: Accented Stems</u> ¹³					
$\overline{\text{un}}\acute{\text{y}}\overline{\text{l}}+\overline{\text{a}}$	$\overline{\text{un}}\acute{\text{y}}\overline{\text{l}}+\text{o}$	$\overline{\text{un}}\acute{\text{y}}\overline{\text{l}}+\text{y}\text{j}$	$\overline{\text{un}}\acute{\text{y}}\overline{\text{l}}+\text{a}\text{j}\text{a}$	$\overline{\text{un}}\acute{\text{y}}\overline{\text{l}}+\text{o}\text{j}\text{e}$	'depressed'
$\overline{\text{j}}\text{á}\text{r}+\text{a}$	$\overline{\text{j}}\text{á}\text{r}+\text{o}$	$\overline{\text{j}}\text{á}\text{r}+\text{y}\text{j}$	$\overline{\text{j}}\text{á}\text{r}+\text{a}\text{j}\text{a}$	$\overline{\text{j}}\text{á}\text{r}+\text{o}\text{j}\text{e}$	'furious'
$\overline{\text{s}}\text{pó}\text{r}\text{n}+\text{a}$	$\overline{\text{s}}\text{pó}\text{r}\text{n}+\text{o}$	$\overline{\text{s}}\text{pó}\text{r}\text{n}+\text{y}\text{j}$	$\overline{\text{s}}\text{pó}\text{r}\text{n}+\text{a}\text{j}\text{a}$	$\overline{\text{s}}\text{pó}\text{r}\text{n}+\text{o}\text{j}\text{e}$	'debatable'
(ii) <u>Class C: Unaccented Stems</u>					
$\overline{\text{m}}\text{o}\overline{\text{l}}\text{o}\overline{\text{d}}+\overline{\text{a}}$	$\overline{\text{m}}\text{o}\overline{\text{l}}\text{o}\overline{\text{d}}+\text{o}$	$\overline{\text{m}}\text{o}\overline{\text{l}}\text{o}\overline{\text{d}}+\text{o}\overline{\text{j}}$	$\overline{\text{m}}\text{o}\overline{\text{l}}\text{o}\overline{\text{d}}+\overline{\text{a}}\text{j}\text{a}$	$\overline{\text{m}}\text{o}\overline{\text{l}}\text{o}\overline{\text{d}}+\text{o}\overline{\text{j}}\text{e}$	'young'
$\overline{\text{d}}\text{o}\overline{\text{r}}\text{o}\overline{\text{g}}+\overline{\text{a}}$	$\overline{\text{d}}\text{o}\overline{\text{r}}\text{o}\overline{\text{g}}+\text{o}$	$\overline{\text{d}}\text{o}\overline{\text{r}}\text{o}\overline{\text{g}}+\text{o}\overline{\text{j}}$	$\overline{\text{d}}\text{o}\overline{\text{r}}\text{o}\overline{\text{g}}+\overline{\text{a}}\text{j}\text{a}$	$\overline{\text{d}}\text{o}\overline{\text{r}}\text{o}\overline{\text{g}}+\text{o}\overline{\text{j}}\text{e}$	'dear'
$\overline{\text{u}}\text{d}\text{a}\overline{\text{l}}+\overline{\text{a}}$	$\overline{\text{u}}\text{d}\text{a}\overline{\text{l}}+\text{o}$	$\overline{\text{u}}\text{d}\text{a}\overline{\text{l}}+\text{o}\overline{\text{j}}$	$\overline{\text{u}}\text{d}\text{a}\overline{\text{l}}+\overline{\text{a}}\text{j}\text{a}$	$\overline{\text{u}}\text{d}\text{a}\overline{\text{l}}+\text{o}\overline{\text{j}}\text{e}$	'far' ¹⁴
(iii) <u>Class B: Post-Accenting Stems</u> ¹⁵					
$\text{sme}\check{\text{s}}\text{n}+\overline{\text{a}}$	$\text{sme}\check{\text{s}}\text{n}+\text{o}$	$\text{sme}\check{\text{s}}\text{n}+\text{o}\overline{\text{j}}$	$\text{sme}\check{\text{s}}\text{n}+\overline{\text{a}}\text{j}\text{a}$	$\text{sme}\check{\text{s}}\text{n}+\text{o}\overline{\text{j}}\text{e}$	'funny'
$\check{\text{c}}\text{u}\text{d}\text{n}+\overline{\text{a}}$	$\check{\text{c}}\text{u}\text{d}\text{n}+\text{o}$	$\check{\text{c}}\text{u}\text{d}\text{n}+\text{o}\overline{\text{j}}$	$\check{\text{c}}\text{u}\text{d}\text{n}+\overline{\text{a}}\text{j}\text{a}$	$\check{\text{c}}\text{u}\text{d}\text{n}+\text{o}\overline{\text{j}}\text{e}$	'strange'
$\text{bla}\check{\text{z}}\text{n}+\overline{\text{a}}$	$\text{bla}\check{\text{z}}\text{n}+\text{o}$	$\text{bla}\check{\text{z}}\text{n}+\text{o}\overline{\text{j}}$	$\text{bla}\check{\text{z}}\text{n}+\overline{\text{a}}\text{j}\text{a}$	$\text{bla}\check{\text{z}}\text{n}+\text{o}\overline{\text{j}}\text{e}$	'capricious'

The examples in (i) have stress fixed on the same vowel in both the short and long forms. These adjectives have accented stems, and thus they belong to Class A. My analysis correctly predicts that the BAP will assign stress to the accented vowel of the stem in all forms, short and long.

The examples in (ii) have mobile stress in the short form, which tells us that their stems are unaccented (Class C). The examples in (iii) have stress fixed on the inflection in the short form, which tells us that their stems are post-accenting (Class B). Both classes B and C have stress fixed on the inflection in the long form. As argued above, in the case of Class C adjectives, this is due to the inflection having

a lexically-assigned accent. In the case of Class B adjectives, this is due to the stem accent being transferred to the inflection.

Thus the correspondence between short and long form stress patterns shown in (6) are exactly what we expect to find, given our assumptions about the accentual properties of roots and inflectional suffixes. However, the facts are more complicated than what is presented in (6). Two additional combinations of short and long form stress patterns occur.

Before we examine these, let us review the various possible combinations that could occur. Given that there are three short form and two long form stress patterns, a total of six combinations of short and long form stress patterns are logically possible. (I am including Class C' stress with Class C and Class B' stress with Class B.) These are listed below. Of these, five actually occur. We have already seen evidence of three of them (i.e. (i), (iv), and (vi) in the table below).

(7) Possible Relations Between Short and Long Form Stress

<u>SHORT FORM</u>	<u>LONG FORM</u>	<u>ATTESTED</u>
(i) fixed on stem	fixed on stem	yes
(ii) fixed on stem	fixed on inflection	no
(iii) fixed on inflection	fixed on stem	yes
(iv) fixed on inflection	fixed on inflection	yes
(v) mobile	fixed on stem	yes
(vi) mobile	fixed on inflection	yes

The only combination which does not occur is fixed stress on the stem in the short form and fixed stress on the inflection in the long

form. Before explaining this gap, I want to examine the two additional combinations of patterns which do occur and which we have not yet accounted for, namely (iii) and (v) in the table above.

Consider the data in (8). (As before, I will cite the f and n short forms and the three nom sg long forms. I will identify each pattern by the same number as the one associated with it in the table in (7).)

(8) Two Additional Combinations of Short and Long Form Stress

<u>SHORT FORM</u>		<u>LONG FORM</u>			
(iii)					
<u>F</u>	<u>N</u>	<u>M</u>	<u>F</u>	<u>N</u>	
svež+á	svež+ó	svěž+ij	svěž+aja	svěž+oje	'fresh'
umn+á	umn+ó	úmn+yj	úmn+aja	úmn+oje	'smart'
težel+á	težel+ó	težól+yj	težól+aja	težól+oje	'difficult'
xoroš+á	xoroš+ó	xoróš+ij	xoróš+aja	xoróš+oje	'good'
(v)					
<u>F</u>	<u>N</u>	<u>M</u>	<u>F</u>	<u>N¹⁶</u>	
dolg+á	dólg+o	dólg+ij	dólg+aja	dólg+oje	'long'
dešev+á	děšev+o	dešov+yj	dešov+aja	dešov+oje	'expensive'
xolodn+a	xólodn+o	xolódn+yj	xolódn+aja	xolóln+oje	'cold'
vesel+á	věsel+o	ves'ól+ij	ves'ól+aja	ves'ól+oje	'merry'
korotk+á	kórotk+o	korótk+ij	korótk+aja	korótk+oje	'short'

From the short form stress patterns, we know that the adjectives in (iii) have post-accenting stems while those in (v) have unaccented stems. It is not only the case that both sets of adjectives have stress on the stem in the long form, but more specifically, stress is always on the final vowel of the stem. This fact is crucial. What it reveals is that the long forms are subject to Retraction. This rule, which is repeated in (9), moves the accent one syllable to the left, subject to

the condition that the accent originates on the final syllable of the word.

(9) Rule of Retraction

$\dots\sigma_1\acute{\sigma}_2$ ---> $\dots\acute{\sigma}_1\sigma_2$ condition: σ_2 is word-final

Thus, my analysis of the data in (8) is as follows. Adjectives which have stress fixed on the inflection in the short form and fixed on the stem-final vowel in the long form have stems which are post-accenting (i.e. they belong to Class B), but they are subject to Retraction in the long form paradigm. These are the examples under (iii) in (8). Adjectives which have mobile stress in the short form and fixed stress on the stem-final vowel in the long form, have unaccented stems (i.e. they belong to Class C). These are the examples under (v) in (8). They, too, are subject to Retraction in the long form paradigm. Whether a stem is or is not subject to Retraction is an idiosyncratic property of that stem, and thus this information must be included in the lexicon.¹⁷

Thus, without introducing any new mechanisms into the analysis, we can account for every combination of short and long form stress which occurs in the language.

Finally, we need to account for the absence of one of the six logically possible combinations of short and long form adjectival stress: stress fixed on the stem in the short form and on the inflection in the long form. If there were adjectives of this type, we would

assume, given the short form stress, that they had accented stems. As a consequence, the only way for stress to end up on the inflection in the long form would be by Post-Accentuation. But, again, the short form tells us that they are not post-accenting. Thus this gap is not accidental, but is actually predicted by the analysis.

3.5 Stress Assignment in Derived Adjectives

3.5.1 Introduction

Adjectives containing at least one syllabic derivational suffix have stress fixed on the stem in both the long form and, if it occurs, in the short form. This is, of course, what my analysis predicts.

In this section I will present evidence from the adjectival system as additional verification that my analysis predicts the location of the stress in derived words. The data will include two dominant and two nondominant accented suffixes. I could find no clear example of an unaccented adjectival suffix.

Forms derived from the two nondominant accented suffixes, ist and liv, are particularly important in this discussion. We will see that they provide evidence which will require that I modify an earlier claim

about conditions on Post-Accentuation. In Chapter 1 I presented a variety of evidence from the nominal system which indicated that Post-Accentuation only applies when the accented vowel is penultimate. Or, put another way, the evidence indicated that Post-Accentuation only applies before an inflection. In this section we will examine a set of counterexamples to this claim. There is a set of cases in which Post-Accentuation applies word-internally. These cases all have in common that the accent is transferred onto certain adjectival derivational suffixes.

3.5.2 Adjectives Derived with the Suffixes at and ast

The suffixes at and ast build adjectives from nouns denoting parts of the body of humans or animals. Adjectives with at denote possession, sometimes to an enlarged or exaggerated degree. Adjectives with ast emphasize the size of the body part.¹⁸ So, for example, the pair rogátyj and rogástyj, derived from the root rog meaning 'horn', have the meanings 'horned' and 'having large horns', respectively.

Consider the data in (10). The left column includes each base noun and its accentual class. In the right column, I cite the m nom sg of the long form and the f of the short form (if attested). All of the derived adjectives, both short and long, have fixed stress.

(10) Adjectives Derived with the Suffix ast

<u>BASE NOUN</u>	<u>DERIVED ADJECTIVE</u>	
	<u>LONG</u>	<u>SHORT</u>
(i) <u>at</u>		
mórda (A) 'snout'	mordát+yj	mordát+a 'having a snout'
púza (A) 'belly'	puzát+yj	puzát+a 'having a belly'
ús (A) 'moustache'	usát+yj	usát+a 'mustachioed'
xvóst (B) 'tail'	xvostát+yj	xvostát+a 'having a tail'
vólos (C) 'hair'	volosát+yj	volosát+a 'having hair'
(ii) <u>ast</u>		
górlo (A) 'throat'	gorlást+yj	gorlást+a 'loud-mouthed'
gríva (A) 'mane'	grivást+yj	grivást+a 'long-maned'
mórda (A) 'snout'	mordást+yj	mordást+a 'large-muzzled', large-mugged'
púza (A) 'belly'	puzást+yj	puzást+a 'big-bellied'
jazyk (E) 'tongue'	jazykást+yj	jazykást+a 'sharp-tongued'
borodá (C) 'beard'	borodást+yj	borodást+a 'heavily bearded'

Without exception, stress is fixed on the derivational suffix. The crucial cases are those built from nouns with accented roots (i.e. Class A), which is why I have included more examples of that type. Those examples show that both of these suffixes are dominant, since they trigger deaccentuation of the stem. The fact that stress always goes on the suffix shows that both are lexically accented. If they were dominant and unaccented, stress would be assigned to the initial vowel of the stem.

3.5.3 Post-Accentuation and the Adjectival Suffixes ist and liv

Next I want to examine stress assignment in words derived from the adjectival suffixes ist and liv.

The suffix ist attaches primarily to nominal stems, building adjectives with the meaning 'having the quality of X, often in great quantity,' where X = the noun. The suffix liv forms adjectives from both verbal and nominal stems. Since I have not yet discussed verbs, I will only present examples of these adjectives which are derived from nominal stems. These adjectives also denote possession of a property, usually in substantial quantity.

Consider the examples in (11), noting in particular the location of stress in those words derived from Class B nouns. As before, I cite the m nom sg long form and the f short form (when the short form is attested). The data show that adjectives derived with these suffixes have fixed stress either on the root or the derivational suffix, never on the inflection.

(11) Adjectives Derived with the Suffixes ist and liv

<u>BASE NOUN</u>	<u>DERIVED ADJECTIVE</u>	
	<u>LONG</u>	<u>SHORT</u>
(i) <u>ist</u>		
poróda (A) 'breed'	poródist+yj	poród+a 'thoroughbred'
glína (A) 'clay'	glínist+yj	'argillaceous'
uščél' (A) 'ravine'	uščélist+yj	uščélist+a 'abounding in ravines' ¹⁹
xólm (B) 'hill'	xolmíst+yj	xolmíst+a 'hilly'
luč (B) 'ray'	lučíst+yj	lučíst+a 'radiant'
kúst (B) 'bush'	kustíst+yj	kustíst+a 'bushy'
zernó (B) 'grain'	zerníst+yj	zerníst+a 'granular'
gorá (C) 'mountain'	goríst+yj	goríst+a 'mountainous'
volná (C) 'wave'	volníst+yj	volníst+a 'wavy'
(ii) <u>liv</u>		
talánt (A) 'talent'	talántliv+yj	talántliv+a 'talented'
sóvest' (A) 'conscience'	sóvestliv+yj	sóvestliv+a 'conscientious'
zabóta (A) 'care'	zabótliv+yj	zabótliv+a 'solicitous' ²⁰
dožd' (B) 'rain'	doždlív+yj	doždlív+a 'rainy'
toská (B) 'depression'	tosklív+yj	tosklív+a 'melancholy'
šút (B) 'jester'	šutlív+yj	šutlív+a 'humorous'
slezá (B) 'tear'	slezlív+yj	slezlív+a 'tearful'
sirotá (B) 'orphan'	sirotlív+yj	sirotlív+a 'lonely'
xlópoty (C) (no sg) 'trouble'	xlopotlív+yj	xlopotlív+a 'exacting'

We can conclude from the data that liv and ist are nondominant, since accented stems (Class A) get the stress in words derived with these suffixes. That these suffixes are accented is shown by the fact that stress falls on the suffix when the stem is unaccented (i.e. Class C). What appears in this data that we have not seen before is a nondominant, accented derivational suffix getting stress when attached to a post-accenting (i.e. Class B) stem.

In my discussion of Post-Accentuation in Chapter 1 Section 2.3.1, I presented a variety of data from the nominal system which indicated that Post-Accentuation only applies when the accented syllable is penultimate, transferring the accent to the final syllable. The data in (11) show that this cannot be maintained as a general condition on Post-Accentuation.

It may be helpful to review some of the data from the earlier discussion. Consider, for example, two Class B (i.e. post-accenting) nonderived nouns: plód 'fruit' and krést 'cross'. When the +accented, -dominant nominal suffix nik is added, the derived form has stress fixed on the root, not on the derivational morpheme: plódnik (A) and kréstnik (A) 'godson'.

The same holds true for derived noun stems in which the stem-final suffix is post-accenting. Take, for example, the dominant, post-accenting nominal suffix ež. Stems derived from this suffix are post-accenting: čertež+á (gen sg), čertež+ú (dat sg) 'drawing' (from čertá (B) 'line'); kartež+á (gen sg), kartež+ú (dat sg) 'card playing' (from kárta (A) 'card')). When the derivational suffix nik is added, forming a noun referring to a person who does 'x', stress remains on the post-accenting derivational suffix: čert'óžnik+a (gen sg), čert'óžnik+u (dat sg) 'draughtsman'; kart'óžnik+a (gen sg), kart'óžnik+u (dat sg) 'card-player'.

From the data in (11), we can see that in the **adjectival system** the conditions on Post-Accentuation are relaxed. In adjectives derived from the suffixes ist and liv, both of which are accented and nondominant, Post-Accentuation occurs word-internally. In particular, compare the following pairs of words derived from Class B (i.e. post-accenting) roots. The nonderived noun is post-accenting. One derived word is a noun formed from the [-accented, -dominant] diminutive suffix ik. The other is an adjective derived from the [+accented, -dominant] suffix ist.

(12)

<u>BASE NOUN</u>	<u>DERIVED NOUN (ik)</u>	<u>DERIVED ADJ (ist)</u>
xvóst (B) 'tail'	xvóstik (A) 'little tail'	xvostístyj (A) 'having a large tail'
stvól (B) 'tree trunk or stem'	stvólik (A) 'little trunk'	stvolístyj (A) 'having a large trunk'
xólm (B) 'hill'	xólmik (A) 'little hill'	xolmístyj (A) 'hilly'

It does not appear, however, that Post-Accentuation applies word-internally in all derived adjectives. Consider, for example, those with the suffix in. This suffix forms possessive adjectives from second declension nouns denoting persons (usually kinship terms). They have a mixed declension. In the nom and acc cases of both the sg and pl, they have short forms; in the oblique cases, they have long forms.

The precise accentual property of this suffix is not clear. This is because the crucial cases, namely forms derived from an unaccented

root, do not exist. We can determine that it is not dominant. Thus, it could only get stress if it is itself accented and the stem is unaccented, or else by Post-Accentuation.²¹ I found only two examples of adjectives derived from Class B' nominal roots (i.e. post-accenting with Retraction in the plural). Both of these adjectives have stress on the root. The suffixes ist and liv, in contrast, are regularly stressed when the preceding root or stem belongs to Class B' (cf. the examples in (11)).

The examples are given in (13). I include one example which is derived from a Class A noun which shows that the suffix in is [-dominant, -accented]. Since these adjectives are of mixed declension, I have cited one short and one long form.

(13)

<u>BASE NOUN</u>	<u>DERIVED ADJECTIVE</u>	
	<u>F, NOM SG</u>	<u>DAT PL</u>
svekróv' (A) 'mother-in-law'	svekróvin+a	svekróvin+ym
sestra (B) 'sister'	séstrin+a	séstrin+ym
žená (B') 'wife'	žénin+a	žénin+ym

To handle these facts about Post-Accentuation, I will simply stipulate that the final syllable is extrametrical in adjectives with stems ending in ist and liv. The rule of Post-Accentuation will then apply regularly, since the suffixes ist and liv will be treated as word-final.

3.6 Stress and the Adjectival Suffix *ov*

We have seen that long form adjectives have stress fixed either on the stem or on the inflection. To account for this fact, I argued that all long form inflections are accented. Consequently, adjectives with post-accenting stems and adjectives with unaccented stems will both have stress fixed on the inflection, while those with accented stems will have stress fixed on the stem.

There is a set of long form adjectives, however, which does not conform to my analysis. These adjectives are derived with the suffix *ov*. This is the most productive suffix for forming relational adjectives.²² Stress in these adjectives is indeed fixed either on the stem or inflection. The problem consists in predicting which particular vowel gets stressed. If we consider those adjectives whose only derivational suffix is *ov*, we find that stress may be fixed in one of three places: on the root, on the derivational suffix, or on the inflection. Examples are given in (14). I have cited the three nom sg forms: m, f, and n.

(14) Stress in Adjectives Consisting of a Root, the Suffix *ov*, and Inflection

- (i) Stress fixed on the root:
znák+ov+ij, znák+ov+aja, znák+ov+oje 'sign' (adj)
- (ii) Stress fixed on the derivational suffix:
slon+óv+ij, slon+óv+aja, slon+óv+oje 'elephant' (adj)
- (iii) Stress fixed on the inflection:
sneg+ov+ój, sneg+ov+ája, sneg+ov+óje 'snow' (adj)

The problem is this. Let us assume that ov is not a dominant (i.e. stress-deleting) suffix. If ov is accented, and not post-accenting, then we would expect stress to fall either on the root (if the root is accented) or on ov (if the root is unaccented), but not on the inflection. If ov is post-accenting, then we would expect stress to be fixed either on the root or on the inflection, but not on ov. If this suffix is unaccented, and if we maintain the assumption that all suffixes are cyclic, then we would expect stress to fall either on the initial vowel of the word (if the root is unaccented) or else on the accented vowel of the root (if the root is lexically accented), never on ov or on the inflection.

If we were to assume that ov is dominant and accented, then we would expect stress to always fall on this suffix. If it were dominant and post-accenting, stress should always fall on the inflection.

In other words, there is no single assumption about the accentual property of this suffix which captures the fact that stress can fall on any one of the three morphemes comprising these adjectives.

Let us investigate this suffix further by examining the relation between the stress properties of these adjectives and their related nonderived nouns, to see if any clear pattern emerges. Examples are given in (15). I will cite only the m nom sg form of the adjective.

(15) **Stress in Adjectives Derived with ov and the Related
Nonderived Nouns**

(i) Stress on the Adjectival Root

štámbovyj	štámb (A) 'tree trunk'
goróxovyj	goróx (A) (no pl) 'peas'
pádybovyj	pádub (A) 'holly'
berězovyj	berěza (A) 'birch'
rúslovyj	rúslo (A) 'river channel'
t'ágovij	t'ága (A) 'traction'
oréxovyj	oréxa (A) 'nut' ²³

(ii) Stress on the Derivational Suffix

plódovýj	plód (A) 'fruit'
bredovýj	bréd (A) 'delirium'
xrenovýj	xrén (A) 'horseradish'
slonovýj	slón (B) 'elephant'
klopovýj	klóp (B) 'bug'
kostrovýj	kost'ór (B) 'campfire'
rudovýj	rudá (B) 'ore'
sádovýj	sád (C) 'garden' ²⁴

(iii) Stress on the Inflection

gryževój	gryžá (A) 'hernia'
šumovój	šúm (A) 'noise'
lučevój	lúč (B) 'ray'
stolbovój	stólb (B) 'post'
licevój	licó (B) 'face'
duševój	dušá (C) 'soul'
gorodovój	górod (C) 'city' ²⁵

There is only one important generalization that emerges from these data: those adjectives with stress on the root morpheme always have accented roots. This is not a biconditional, however. Accented nominal roots (i.e. Class A) form adjectives in ov with stress fixed on the derivational suffix and on the inflection, as well.

Another way of stating this generalization is that there are no adjectives with stress on the root morpheme which have unaccented roots. This fact tells us that ov is never unaccented. If the suffix ov were unaccented, we would predict that adjectives whose root morphemes are unaccented would have stress fixed on the initial vowel of the root. (This assumes, of course, that ov is a cyclic suffix.)

It seems clear from the data in (ii) and (iii) that any analysis will have to recognize more than one accentual type of ov. I propose that there are three types of ov:

- | | |
|---------------------------------|----------------|
| (i) +accented | (ii) +accented |
| -dominant | +dominant |
| (iii) +accented, post-accenting | |
| +dominant | |

Accentual type (i) accounts for those cases in which an accented root is stressed (i.e. all the examples in group (i) of (15)) and those in which stress is on ov when the root is unaccented (e.g. sadóvyj, in group (ii)). Accentual type (ii) accounts for the cases in which the root is accented or post-accenting (i.e. Classes A and B), and stress falls on the suffix ov (cf. group (ii) in (15)). Accentual type (iii) accounts for all those cases in which stress is fixed on the inflection.

In all of the cases examined thus far, ov was the only derivational suffix. If we consider cases in which ov is added to a derived stem, however, we discover that stress is quite predictable.

Consider, for example, adjectives built from Class B nouns derived with the suffix nik.²⁶ If ov is attached to these nominal stems, stress consistently falls on the suffix ov. Examples are given in (16).

(16) ov Adjectives Formed from Class B Nominal Stems
Derived with the suffix nik

<u>BASE NOUN</u>	<u>DERIVED ADJECTIVE</u>
plavník (B) 'fin'	plavníkóv+yj
ledník (B) 'glacier'	ledníkóv+yj
rudník (B) 'mine'	rudníkóv+yj
cvetník (B) 'flowerbed'	cvetníkóv+yj
kološník (B) 'furnace throat'	kološníkóv+yj
sošník (B) 'ploughshare'	sošníkóv+yj

Further evidence comes from Class B nominal stems which are derived from the dominant, post-accenting diminutive suffix Ek. Examples are given in (17).²⁷

(17) ov Adjectives Formed from Class B Nominal Stems
Derived with the Diminutive Suffix Ek

<u>BASE NOUN</u>	<u>DERIVED ADJECTIVE</u>
snežók (B) 'light snow'	snežkóv+yj
pirožók (B) 'little pie'	pirožkóv+yj
gribók (B) 'little mushroom'	gribkóv+yj
jazyčók (B) 'uvula' (i.e. a 'little tongue')	jazyčkóv+yj

There is a third set of data which, though it is small, indicates that ov does not get stress when it attaches to a Class A derived stem. The examples are stems derived with the unaccented, nondominant diminutive suffix ik.

(18) ov Adjectives Formed from Class A Nominal Stems
Derived with the Diminutive Suffix ik

<u>BASE NOUN</u>	<u>DERIVED ADJECTIVE</u>
šárik (A) 'little sphere'	šárikov+yj
péstik (A) 'little pestle'	péstikov+yj
pýžik (A) 'young deer'	pýžikov+yj

There are other stems which end in ik, but whose morphological structure is less transparent. Nevertheless, if the nominal stem is Class A, stress in the adjective is on the same vowel as in the noun; if the stem is Class B, stress falls on ov. Examples are given in (19).

(19) Other Examples of ov Adjectives Derived from Stems Ending
in ik

<u>BASE NOUN</u>	<u>DERIVED ADJECTIVE</u>
rýžik (A) 'saffron mushroom'	rýžikov+yj
rólik (A) 'roller'	rólikov+yj
królik (A) 'rabbit'	królikov+yj
kótik (A) 'sealskin'	kótikov+yj
plavík (B) (min) 'fluorspar'	plavikóv+yj
tupík (B) 'impasse'	tupikóv+yj
materík (B) 'continent'	matikóv+yj
parík (B) 'wig'	parikóv+yj

Let us summarize these data. When ov attaches to nonderived stems, stress may occur on the root, on the suffix ov, or on the inflection. The only generalization is that those forms with stress on the root have accented roots.

When ov attaches to derived stems, three generalizations emerge: (i) stress is never on the inflection; (ii) if the stem belongs to Class A, then stress in the adjective is fixed on the same vowel in the stem;

and (iii) if the stem belongs to Class B, stress in the adjective is fixed on the suffix ov. (Derived stems will never be of Class C, i.e. unaccented).

In order to account for stress in those adjectives in which ov attaches to a nonderived stem, one has to assume that there is more than one accentual type of ov. For example, in order to account for the fact that in forms with Class A roots, stress sometimes goes on the root, sometimes on the ov, there must be both a dominant and a nondominant accented ov. I postulated three accentual types for this suffix: (i) +accented, -dominant (ii) +accented, +dominant (iii) post-accenting, +dominant.

When ov is attached to derived stems which are post-accenting, it consistently gets the stress. It is not clear, however, how to analyze these facts. It may appear obvious that ov is getting stress from the post-accenting stem to which it attaches. We have indeed seen two clear cases of adjectival derivational suffixes which get stress due to Post-Accentuation, ist and liv, so this approach would not entail any complication in my analysis.

However, my analysis does not rule out an alternative account of these forms, according to which the ov suffix in these cases is +accented, +dominant.

If we assume this second alternative, another problem arises. We have seen that when ov attaches to derived Class A stems, ov never gets the stress. If ov has a dominant, accented form, why does it never occur with Class A derived stems? One solution is to formulate a condition which limits affixation of the dominant forms of this suffix to nonderived stems (thus implying that Class B derived stems regularly transfer the accent to ov, in order to account for the cases described above).

Proposing such a condition is not a trivial matter, however, for it has important implications for the theory of word-formation. In order for the distinction between derived and nonderived stems to be accessible on a given cycle, the internal structure of the stem has to be visible. If we assume, as I have, that bracket erasure takes place at the end of each cycle, then this distinction is necessarily lost. Consequently, conditions on affixation should not be sensitive to the derivational status of a stem.

3.7 APPENDIX: adjectives derived with the suffix ov

(i) Stress on the Root Morpheme

<u>ADJECTIVE</u>	<u>BASE NOUN</u> (all belong to Class A)
1. grábovyj	gráb (bot) 'hornbeam'
2. krábovyj	kráb 'crab'
3. šájbovyj	šájba (tech) 'washer'
4. štámbovyj	štámb 'tree trunk'
5. skárpovyj	skárb 'goods & chattels'
6. pádubovyj	pádub 'holly'
7. rózgovyj	rózga 'birch'
8. nabégovyj	nabég 'raid'
9. zalógovyj	zalóg (gram.) 'voice'
10. t'ágovyj	t'aga 'traction'
11. s'ézdovyj	s'ézd 'congress'
12. berëzovyj	berëza 'birch'
13. oréxovyj	oréx 'nut'
14. glýbovyj	glýba 'clod, lump'
15. porógovyj	poróg 'threshold'
16. rogózovyj	rogóz (bot) 'reed mace'
17. zlákovyj	zlák 'grass'
18. lúkovyj	lúk 'onion'
19. rúslovyj	rúslo 'river channel'
20. brómovyj	bróm 'bromine'
21. xrómovyj	xróm 'chromium'
22. plánovyj	plán 'plan'
23. kránovyj	krán 'tap'
24. kónovyj	kón (game) 'kitty'
25. répovyj	répa 'turnip'
26. lámpovyj	lámpa 'lamp'
27. spórovyj	spóra 'spore'
28. trósovyj	trós 'rope'
29. goróxovyj	goróx (no pl) 'pea(s)'

(ii) Stress on the Suffix ov

<u>ADJECTIVE</u>	<u>BASE NOUN</u>
1. bredóvyj	bréd (A) 'delirium'
2. solodóvyj	sólod (A) 'malt'
3. plodóvyj	plód (A) 'fruit'
4. grammóvyj	grámm (A) 'gram'
5. klenóvyj	klën (A) 'maple'
6. xrenóvyj	xrén (A) 'horseradish'
7. dernóvyj	dërn (A) 'turf'
8. ternóvyj	tërn (A) 'blackthorn'
9. kilometróvyj	kilométr (A) 'kilometer'
10. tesóvyj	tës (A) (collect.) 'planks'
11. fruktóvyj	frúkt (A) 'fruit'
12. počtóvyj	póčta (A) 'mail'
13. puxóvyj	púx (A) 'fluff'
14. bobóvyj	bób (B) 'beam'
15. xalvóvyj	xalvá (B) 'halva'
16. očagóvyj	očág (B) 'hearth'
17. sigóvyj	síg (B) 'whitefish'
18. sudakóvyj	sudák (B) 'pike-perch'
19. slonóvyj	slón (B) 'elephant'
20. snopóvyj	snóp (B) 'sheaf'
21. klopóvyj	klóp (B) 'bug'
22. šatróvyj	šatër (B) 'tent'
23. kostróvyj	kostër (B) 'campfire'
24. osetróvyj	osëtr (B) 'sturgeon'
25. klestóvyj	klëst (B) (orn) 'crossbill'
26. xrebtóvyj	xrebét (B) 'spire'
27. xlystóvyj	xlýst (B) 'whip'
28. krestóvyj	krést (B) 'cross'
29. leščóvyj	léšč (B) (fish) 'bream'
30. xvoščóvyj	xvóšč (B) (bot) 'horse-tail'
31. kitóvyj	kít (B) 'whale'
32. žgutóvyj	žgút (B) 'plait'
33. stvolóvyj	stvól (B) 'stem'
34. užóvyj	úž (B) 'grass-snake'
35. nožóvyj	nóž (B) 'knife'
36. drozdóvyj	drózd (B) 'thrush'
37. rudóvyj	rudá (B') 'ore'
38. sosnóvyj	sosná (B') 'pine tree'
39. sadóvyj	sád (C) 'garden'
40. dubóvyj	dúb (C) 'oak'
41. basóvyj	bás (C) (mus) 'bass'
42. domóvyj	dóm (C) 'house'

(iii) Stress on the Inflection

<u>ADJECTIVE</u>	<u>BASE NOUN</u>
1. slizevój	slíz' (A) 'mucus'
2. gryževój	grýža (A) 'hernia'
3. kr'aževój	kr'áž (A) 'mountain ridge'
4. gr'azevój	gr'áz' (A) 'mud'
5. grebnevój	grében' (A) 'comb'
6. stilevój	stíl' (A) 'style'
7. pylevój	pýl' (A) 'dust'
8. riskovój	rísk (A) 'risk'
9. šumovój	šúm (A) 'noise'
10. xrapovój	xráp (A) 'snore'
11. kursovój	kúrs (A) 'course'
12. svistovój	svíst (A) 'whistle'
13. gorlovój	górlo (A) 'throat'
14. doždevój	dóžd' (B) 'rain'
15. guževój	gúž (B) 'tug' (part of harness)
16. lúčevój	lúč (B) 'ray'
17. plaščevój	plášč (B) 'cloak'
18. stolbovój	stólb (B) 'post'
19. stolpovój	stólp (B) 'pillar'
20. stixovój	stíx (B) 'verse'
21. dugovój	dugá (B) 'shaft-bow'
22. licevój	licó (B) 'face'
23. zernovój	zernó (B) 'grain'
24. gvozdevój	gvózd' (C) 'nail'
25. žerdevój	žerd' (C) 'pole'
26. meževój	mežá (C) 'boundary'
27. storoževój	stórož (C) 'guard'
28. nogtevój	nógot' (C) 'fingernail'
29. duševój	dušá (C) 'soul'
30. snegovój	snég (C) 'snow'
31. slogovój	slóg (C) 'syllable'
32. gorodovój	górod (C) 'city'
33. delovój	délo (C) 'matter'
34. boronovój	boroná (C) 'harrow'
35. stenovój	stená (C) 'wall'
36. golosovój	gólos (C) 'voice'

Notes: Chapter 3

1. The following sentences illustrate the use of short form adjectives:

- (i) Zadáč+a složn+á.
problem (f nom sg) complicated (f)
The problem is complicated.
- (ii) Zadáč+i slóžn+y.
problem (f nom pl) complicated (pl)
The problems are complicated.
- (iii) Górod+ø Šúmen+ø.
city (m nom sg) noisy (m)
The city is noisy.

2. The following sentences illustrate the use of long form adjectives.

- (i) Matematik v konce koncov sumél rešít'

et+u slóžn+uju zadáč+u.
this difficult (f, acc sg) problem (f, acc sg)

The mathematician finally succeeded in solving this
difficult problem.

- (ii) Matematik v konce koncov sumél rešít'

et+i slóžn+yje zadáč+i.
these difficult (f, acc pl) problems (f, acc pl)

The mathematician finally succeeded in solving these
difficult problems.

- (iii) My živem v

šúmn+om górod+e.
noisy (m, loc sg) city (m, loc sg)
We live in a noisy city.

3. Other researchers have noted the problem which these adjectives pose for an analysis of the stress system (cf. Gimpelevič (1971) and Halle (1973), among others).

4. There are approximately 100 adjectives of this type.

5. This classification is the same as that used by Zaliznjak (1977).

6. I checked these examples with one informant. He consistently stressed the inflection, rather than the initial vowel, in the pl.

7. In this regard, notice examples (vi)-(viii). Each of these has a stem consisting of a root and the suffix ok. The suffix ok which occurs in these examples does not exhibit vowel-zero alternations, and it appears in only four adjectives (cf. Zaliznjak (1977), p. 293). Three of these have the stress pattern shown in (2). The fourth example has stress fixed on the stem and its meaning bears no relation to color or size: žestók+a (f), žestók+o (m), žestók+o (n), žestók+i (pl) 'cruel'.

8. My informant consistently stressed the stem in the n and pl in these examples.

9. If a stem ends in a soft consonant or front glide, the initial vowel of the inflection is fronted. In addition, y becomes i after a velar.

10. In the acc sg, inanimate m and n nouns take the same case ending as the nom, while animate nouns take the same case ending as the gen sg. All nouns make this distinction in the pl. The same patterns occurs in the declension of long form adjectives.

11. The underlying form of the m nom and acc sg inflection is oj. When it is not stressed, the o becomes y.

12. This raises an interesting question about acquisition. Given that unaccented and post-accenting roots cannot be distinguished by the stress of long form adjectives, what assumption does the child make in the absence of evidence from the short form? Knowing only that a given long form adjective has stress on the inflection, where is the child likely to assign stress in the corresponding short form?

13. Adjectives of this type constitute the largest group. According to Halle (1973, p.323), they number about 17,650. We would expect this to be the largest group, since it includes adjectives of both derived and nonderived stems.

14. According to Halle (1973, p. 323) who cites Zaliznjak (1967), there are 35 adjectives which exhibit these patterns of short and long form stress. This number may seem surprisingly small. However, keep in mind that this class is limited to adjectives either with nonderived stems or

stems derived with nonsyllabic suffixes (e.g. En, Ok). Furthermore, many adjectives have no attested short form. And finally, we will see in the discussion below that adjectives with unaccented stems may exhibit a different stress pattern in the long form than the one illustrated here.

15. Halle (1973, p. 323) cites 8 examples of this type. In addition to the five presented in the text, he lists: zl+ój 'malicious'; rodn+ój 'native'; šal'n+ój 'mad'; xmel'n+ój 'inebriated'; and bol'n+ój 'ill'. This number does seem surprisingly small. However, many adjectives with post-accenting stems are not included here simply because they have no attested short form. And, just as with Class C adjectives, we will see later on that Class B adjectives may exhibit another type of stress pattern in the long form.

16. The last three examples, xolodn+á, veselá, and korotká belong to Class C'. In the pl short form, stress may be either on the inflection or on the initial vowel: xólodn+y ~ xolodn+y', vésel+y ~ vesel+y', kórotk+i ~ korotk+i.

17. In my discussion of Retraction in the nominal system, I noted that, almost without exception, it occurs only in nonderived forms. This suggests that Retraction is a property which may be associated with root morphemes, but not with derivational suffixes.

In the adjectival system, we do find both nonderived and derived forms undergoing Retraction. However, the latter include only words derived from the suffixes En and Ok. These two suffixes are not themselves post-accenting. I have argued that they are underlyingly nonsyllabic and thus are invisible to the BAP. In fact, stems derived with these suffixes may be accented, post-accenting, or unaccented. It is generally the case that the accentual property of the stem-final suffix determines the accentual property of the stem. Since these two suffixes have no accentual property, we can say that they are transparent to the accentual property of the root or stem to which they attach.

18. According to Townsend (1975), from which I draw much of my information about the semantic and selectional properties of these suffixes, adjectives in ast have a colloquial flavor.

19. Although the vast majority of these adjectives which are derived from Class A nouns have stress on the root morpheme, I did find three examples in which stress is on the suffix rather than the root, contrary to my prediction. The examples include: frazíst+yj, from fráza (A) 'sentence, phrase'; m'asíst+yj 'meaty', from m'áso (A) 'meat'; and grebníst+yj '(high)-cresfted', from grében (A) 'comb, crest'. There is another word derived from m'aso which shows exceptional stress. This is the noun m'asník, 'butcher'. The suffix nik, denoting a type of person,

is accented but nondominant. Therefore, we would expect stress to fall on the root.

20. Again, there are some exceptions among adjectives derived from Class A nouns. The ones I found include: truslívýj 'cowardly', from trús 'coward'; skodlívýj 'harmful' (coll), from skóda 'harm'; pisklív+yj 'squeaky', from písk 'squeak'; and vizglívýj 'shrill', from vízg 'scream'.

21. One could argue that, in the absence of evidence to the contrary, the child assumes a morpheme to be unaccented and nondominant. In that case, the child would assume this suffix to be [-accented, -dominant].

22. Recall that only qualitative adjectives occur in the short form.

23. I checked 29 examples of adjectives with stems derived with ov which have stress on the root, and in every case the related nonderived noun belonged to Class A. The list is given in the appendix to this chapter.

24. I checked 42 examples of this type. Adjectives with stress on ov are derived from nominal stems of every accentual type. In the list I compiled, 13 are derived from nouns belonging to Class A, 25 from Class B (or B'), and 4 from Class C.

One could argue that that 3 of the 4 nouns which I have assumed belong to Class C, actually belong to Class B' (i.e. post-accenting with Retraction). All three are masculine nouns with monosyllabic roots. They include: bass 'bass'; sád 'garden; and dúb 'oak. These nouns have stress on the root throughout the singular and on the inflection throughout the plural. In chapter 1, I included nouns of this type in Class C, arguing that their roots are unaccented and that the nom pl suffix y has both accented and unaccented alternants. A possible alternative analysis of the small set of nouns exhibiting this stress pattern (approximately 20) is that they have post-accenting roots, with Retraction applying in the singular. Since there are no nouns exhibiting this stress pattern which have polysyllabic roots, there is no definitive evidence for either analysis of these nouns. However, since all other nouns which exhibit Retraction do so in the plural, I have opted to analyze these cases as belonging to Class C.

The list of 43 examples can be found in the appendix.

25. Of the 36 examples I checked, 13 are derived from Class A nouns; 10 from Class B (or B'); and 13 from Class C.

26. Nik is an accented, post-accenting suffix. It has both dominant and nondominant forms, which are associated with different sets of meanings. The nondominant form usually builds nouns referring to a type of person

(e.g. rabótnik 'worker' from rabóta 'work'), while the dominant form usually builds nouns referring to some kind of object.

27. The vowel in the nominal suffix Ek is a Φ X-yer. It vocalizes only in the nom sg form of the noun.

Chapter 4

VOWEL TRUNCATION, SYLLABIFICATION, AND VERBAL STRESS

4.1 Introduction

Certain stress alternations occur in derived verbs which occur in no other forms in the language. These alternations are linked to the occurrence of vowel sequences, which are found only in derived verbs. I show that stress assignment in these forms is the product of interactions between the BAP, vowel deletion, glide formation, and syllabification processes.

4.2 Verbal Inflection

Russian has complex verbal inflections. The present tense inflection consists of two suffixes, tense and agreement. The present

tense suffix is represented by one of two vowels: either i or e. i has a more limited distribution, occurring only when the stem ends in a front vowel. Otherwise, e is the form of the present tense suffix.

The agreement suffixes, which represent number and person, are given below. Like the present tense suffix, the 3rd pl agreement suffix has two forms, ut and at. I will argue that the underlying forms are ut and nt, respectively. Verbs whose stems end in a front vowel select nt; all others take ut.¹

(1) Present Tense Agreement Suffixes

	SG	PL
1ST	u	m
2ND	š	te
3RD	t	ut/nt

In my discussion of stress in nonderived verbs in Chapter 1, I claimed that the present tense suffix (e) is absent in two forms of the present tense paradigm: the 1st sg and 3rd pl. There were two arguments for this claim.

First, we know that front vowels trigger Velar Palatalization. In nonderived verbs, Velar Palatalization does not apply to root-final consonants in the 1st sg and 3rd pl, as illustrated in (2).

(2) peč 'to bake' Root: [pek]

	SG	PL
1ST	pekú	pečëm
2ND	pečěš	pečěte
3RD	pečët	pekút

The second piece of evidence has to do with stress. Since nonderived verbs with unaccented roots have stress on the present tense suffix wherever that suffix appears, we know that it is accented. If the suffix were present in the underlying representation of the 1st sg and 3rd pl, and deleted in the course of the derivation, then we would expect stress to end up on the root in these two present tense forms. This is because on the second cycle the BAP will construct a right-headed constituent on Line 0, with the accented vowel of the present tense suffix as head. When the vowel deletes, stress should move to the left. However, stress falls on the final vowel (i.e. on the agreement suffix) in these two forms. We can account for this by assuming that the present tense suffix is absent, and that the 1st sg and 3rd pl agreement suffixes are accented.

In (3) I give two derivations of the 1st sg present tense of the nonderived verb Žit', one which assumes the present tense suffix is present and one which assumes that it is absent. The verb root is unaccented.

(3) Derivation of the 1st Sg which Includes the Present Tense Suffix

Živú 'I live'

(i) UR: [[[Žiw] e] u]

	L1		*
	L0	*	*
<u>CYCLE 2</u>		[[XXX] X]	
		Žiw	e

(ii) UR: [[Žiw] u]

	L1		*
	L0	*	*
<u>CYCLE 2</u>		[[XXX] X]	
		Žiw	u

L1	*
L0	(* *)
[[XXX]	X]
ziw	e

$$\begin{array}{cc} L1 & * \\ L0 & (* \quad *) \\ & | \quad | \\ & [(XXX) \quad X] \\ & ||| \quad | \\ & \check{z}iw \quad u \\ & v \end{array}$$

Živú

	L1	*	*
	L0	(* *)	*
<u>CYCLE 3</u>		[[XXXX] X]	
		ž i w e	u

BAP L2 * --> CONFLATION

```

L1      (* *)
L0      (* *) (*)
        | | |
        [ [XXXX] X]
        |||| |
        žiwe  u

```

```

L1      *
L0  (*  *)  *
      |  |  |
      [ [XXXX] X ]
      |||| |
      žiwe  u

```

$$\underline{e} \rightarrow \phi$$
$$\begin{array}{ccc} \text{L1} & * & \\ \text{L0} & (*) & * \\ & | & | \\ & [[XXX] & X] \\ & ||| & | \\ & \text{Ziw} & \text{u} \end{array}$$
W \rightarrow V

*Žívu

The past tense inflection consists of both a tense and agreement suffix. The past tense suffix is l. The agreement suffixes include: a (f), o (m), o (n), and i (pl).² I am going to assume that the vowel representing the m agreement suffix is a Φ X-*yer*. Its representation is given in (4).

(4) Underlying Representation of M Verbal Agreement Suffix

SYLLABLE PLANE	N
SKELETON	X
SEGMENTAL PLANE	o

4.3 Underlying Vowel Inventory of Russian

Apart from the yers, I have assumed that Russian has the following six vowels.

(5) Underlying Vowel Inventory of Russian

	i	u	y	e	o	a
HIGH	+	+	+	-	-	-
LOW	-	-	-	-	-	+
BACK	-	+	+	-	+	+
ROUND	-	+	-	-	+	-

4.4 Review of Stress in Nonderived (Athematic) Verbs

In Chapter 1, I showed that nonderived (athematic) verbs exhibit the same four types of stress patterns as nonderived nouns and adjectives. These are summarized below.

(6) Summary of Stress in Nonderived Verbs

<u>ROOT</u>	<u>STRESS PATTERN</u>
A (accented)	Fixed on the root in all forms
B (post-accenting)	Fixed on the inflection in all forms
C (unaccented)	Mobile: on the inflection throughout the present tense and in the f past tense; otherwise on the root
B' (post-accenting, with Retraction in certain forms)	Shifting: on the inflection throughout the present tense; on the root throughout the past

Because the past tense suffix l is nonsyllabic, it does not trigger the BAP. As a consequence, the Strict Cycle Condition prevents application of the BAP on the cycle in which the past tense suffix enters the derivation.

The four past tense agreement suffixes are: a (f), o (n), o (m), and i (pl). Only the f is accented. I have assumed that the m agreement suffix is a Φ X-*yer*. This means that its representation includes both a feature matrix on the segmental plane and a syllable nucleus linked to the skeleton. However, there is no underlying association between the segmental plane and the skeleton.

This assumption correctly predicts that the m agreement suffix will trigger Vocalization of a stem *yer*.³ Consider the nonderived verb tolóč', 'to grind', whose root is [tolok]. This verb exhibits a vowel-zero alternation, as the representation of the root implies. The second

vowel of the root never surfaces in the present tense. In the past tense it appears only in the m form, surfacing as o. Forms are shown in (7).

(7) Vowel-Zero Alternations in the Nonderived Verb tolóč'

	<u>PRESENT</u>		<u>PAST</u>
1ST SG	tolk+ú	F	tolk+lá
3RD SG	tolč+ět	PL	tolk+lí
3RD PL	tolk+út	M	tolók+ø

Since VOC applies in the m past tense of the verb tolóč', we can infer that both the m agreement suffix and the final vowel of the root [tolók] have segmental content, but their feature matrices are not linked to the skeleton.

In (8) I present derivations of the f and pl forms for each type of nonderived verb. In addition, I give one derivation of the m form, for the verb žit'.

In the first set of derivations, involving the verb lezt', I show each cycle. Thereafter, I begin the derivations on the third cycle, which is the point where the BAP first applies. The derivations are simplified by showing the output of the BAP after Conflation.

(8) Derivations of the F and Pl Past Tense of Nonderived Verbs

(i) ROOT: Class A

EXAMPLE: lézt 'to crawl'

PL: lézli

L1 *

L0 *

|

CYCLE 1 {XXX}

|||

lez

BAP SCC

L1 *

L0 *

|

CYCLE 2 [{XXX} X]

||| |

lez l

BAP SCC

L1 *

L0 * *

| |

CYCLE 3 [{XXXX} X]

|||| |

lezl i

BAP

L1 (*)

L0 (*) *

| |

[{XXXX} X]

|||| |

lezl i

lézli 'they crawled'

F: lézla

L1 *

L0 *

|

CYCLE 1 {XXX}

|||

lez

BAP SCC

L1 *

L0 *

|

CYCLE 2 [{XXX} X]

||| |

lez l

BAP SCC

L1 * *

L0 * *

| |

CYCLE 3 [{XXXX} X]

|||| |

lezl a

BAP

L1 (*)

L0 (*) *

| |

[{XXXX} X]

|||| |

lezl a

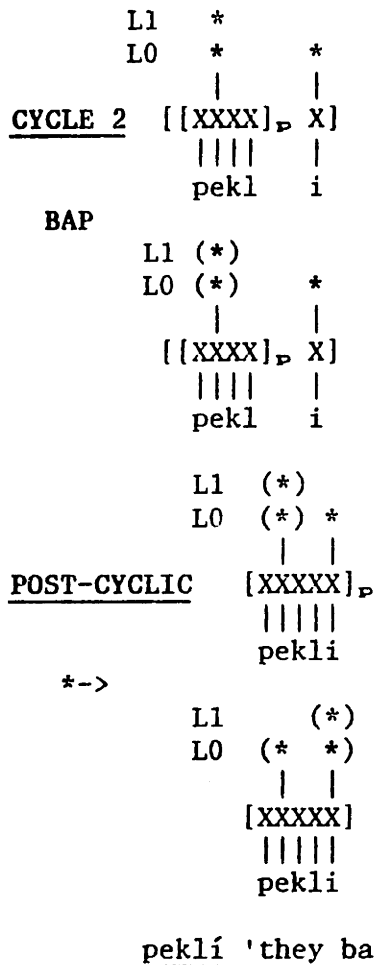
lézla 'she crawled'

(ii) ROOT: Class B

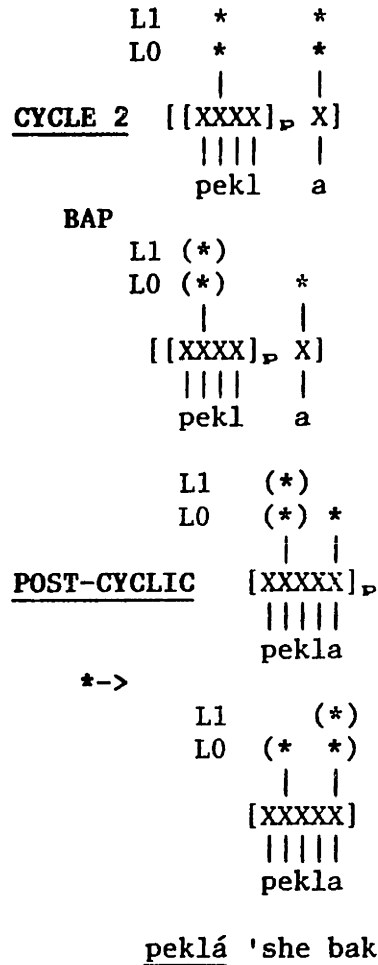
EXAMPLE: peč'

(note: subscript 'p' denotes a post-accenting morpheme)

PL: peklí



F: peklá



(iii) ROOT: Class C
EXAMPLE: Žít 'to live'

PL: Žíli

	L1		
	L0	*	*
<u>CYCLE 3</u>		[[XXXX]	X]
		Žíwl	i

BAP

	L1	(*)	
	L0	(*)	*
		[[XXXX]	X]
		Žíwl	i

POST-CYCLIC

w->φ φ

Žíli 'they lived'

F: Žilá

	L1		*
	L0	*	*
<u>CYCLE 3</u>		[[XXXX]	X]
		Žíwl	a

BAP

	L1		(*)
	L0	(* *)
		[[XXXX]	X]
		Žíwl	a

POST-CYCLIC

w->φ φ

Žilá 'she lived'

M: Žíli

	L1	
	L0	* *
<u>CYCLE 3</u>		[[XXXX] X]
		Žiwl o
<u>BAP</u>		
	L1 (*)	
	L0 (*)	*
		[[XXXX] X]
		Žiwl o
<u>VOC</u>		N.A.

POST-CYCLIC

w->φ	φ
------	---

Žíl 'he lived'

4.5 The Problem of Alternating Stress in Derived Verbs

4.5.1 Introduction

My analysis predicts that words derived with a syllabic derivational suffix will have stress fixed either on the stem or the inflection. We have seen that the stress properties of derived nouns and adjectives support this prediction. In the verb system, however, stress

alternations do occur in forms which contain a syllabic **derivational** suffix. Moreover, there are three distinct patterns of alternation.

Before we examine the problematic data, I will briefly review my analysis of stress in derived nouns and adjectives.

Morphemes may be accented or unaccented. Some accented morphemes are post-accenting. Suffixes may, in addition, be accent-deleting, a property referred to as dominance. This property is independent of whether a suffix is accented or unaccented. I have assumed that the BAP is a cyclic rule and that all suffixes are cyclic.

Given the two properties [\pm accented, \pm dominant], and the fact that some accented suffixes are post-accenting, we get 12 possible combinations of morphemes in a stem composed of a root and derivational suffix. These are summarized in (9).

A few explanations may be helpful in interpreting this table. Since the property \pm dominant only plays a role in stress assignment when the stem is accented, I have condensed the table by indicating that either value for dominance will produce the same stress pattern with unaccented roots. Post-accenting suffixes are identified by p. Where fixed stem stress is indicated, I have noted in parentheses which particular stem vowel gets the stress. The notation *V means that stress falls on the vowel of the root or suffix which is lexically accented. Also, I have not distinguished between accented and post-accenting roots

in the table, since in either case if the word is derived, stress will be on the stem.⁴

(9) Summary of Stress Patterns in Derived Nouns and Adjectives

<u>ACCENTUAL PROPERTIES OF MORPHEMES</u>			<u>STRESS PATTERN</u>
<u>ROOT</u>	<u>DERIVATIONAL SUFFIX</u>		
Accent	Accent Dominant		
+	-	-	fixed on stem (*V of root)
+	+	-	fixed on stem (*V of root)
+	+(p)	-	fixed on stem (*V of root)
+	+	+	fixed on stem (*V of suffix)
+	+(p)	+	fixed on inflection
+	-	+	fixed on stem (initial vowel)
-	-	+/-	fixed on stem (initial vowel)
-	+	+/-	fixed on stem (*V of suffix)
-	+(p)	+/-	fixed on inflection

In derived forms, there are two conditions which cause stress to end up on the inflection: (i) when the stem-final suffix is dominant and post-accenting and (ii) when a nondominant post-accenting suffix attaches to an unaccented root. Otherwise, stress will be fixed on some vowel of the stem, the particular vowel depending on the accentual properties of the morphemes comprising the stem.

In words containing a syllabic derivational suffix, the accentual property of the inflection plays no role. Given the two assumptions that the BAP is a cyclic rule and that all derivational suffixes are cyclic, a derived stem cannot enter the inflectional cycle without an accent. If neither the root nor the first suffix is accented, the default clause of the BAP will apply on the second cycle, assigning an accent to the initial vowel. Since the BAP selects the leftmost

accented vowel, an accented stem vowel will always "win out" over an accented inflectional vowel. This explains why words whose stems contain an underlying syllabic suffix do not exhibit mobile stress, i.e. stress alternating between the initial and final syllables.

There are, however, patterns of stress alternations among derived verbs which are not accounted for by the analysis developed thus far. In this section, I will show that these stress alternations are the result of segmental and syllabification processes interacting with the BAP.

4.5.2 Data: Thematic Verb Stems

There is a set of derived verbs whose stems consist of a root and what has traditionally been termed a theme vowel. There are three theme vowel suffixes: i, e, and a.

Theme vowel suffixes are generally unproductive. Like most verbal suffixes, their function is primarily grammatical, rather than semantic. When they attach to nominal and adjectival roots, they serve a categorial function, verbalizing the stem (e.g. [vesel]_A 'happy' --> [[[vesel]_A i]_V tE]_{INF} --> veselít' 'to amuse'; [cvet]_N 'color' --> [[cvet]_N i]_V tE]_{INF} ---> cvetít' 'to color'). However, they do attach to verbal roots as well (e.g. [pros]_V 'ask' --> [[[pros]_V i]_V tE]_{INF} --> prosit' 'to ask'). In this case they contribute neither grammatical nor

semantic information to the stem. There is a general tendency for verb stems in i to be transitive and those in e to be intransitive.

In the discussion of verbal inflections in Sect. 4.2, I mentioned that the present tense suffix has two alternants: e and i. The only verb stems which select the present tense alternant i are those ending in the theme vowel suffixes i and e. These verbs constitute the second conjugation. All others (including nonderived stems) select e. They belong to the first conjugation.

Recall that I have posited two forms for the 3rd pl agreement suffix: ut and nt. Although the nasal consonant in the alternant nt never surfaces, I will provide evidence to support my assumption that it is indeed present in the underlying representation of this suffix. All verbs which take the present tense suffix e take 3rd pl ut; those which select the present tense suffix i take 3rd pl nt.

The present tense morphology of thematic verbs is summarized in (10).

(10) Present Tense Morphology of Thematic Verbs

<u>THEME SUFFIX</u>	<u>PRESENT TENSE ALLOMORPH</u>	<u>3RD PL ALLOMORPH</u>
a	e	ut
i	i	nt
e	i	nt

In (11) I give complete present and past tense inflectional paradigms for each of the three thematic verb types. For the moment, I will ignore stress.

(11) Present and Past Tense Inflectional Paradigms of Thematic Verbs

(i) beredit 'to irritate'

ROOT: [bered] THEME SUFFIX: [i]

		PRESENT		PAST	
		SG	PL		
1ST	beredž+u	bered+im	F: beredi+la	N: beredi+lo	
2ND	bered+iš	bered+ite	M: beredi+lø		
3RD	bered+it	bered'+at	PL: beredi+li		

(ii) letet 'to fly'

ROOT: [let] THEME SUFFIX: [e]

		PRESENT		PAST	
		SG	PL		
1ST	leč+u	let+im	F: lete+la	N: lete+lo	
2ND	let+iš	let+ite	M: lete+lø		
3RD	let+it	let'+at	PL: lete+li		

(iii) pisat 'to write'

ROOT: [pis] THEME SUFFIX: [a]

		PRESENT		PAST	
		SG	PL		
1ST	piš+u	piš+em	F: pisa+la	N: pisa+lo	
2ND	piš+eš	piš+ete	M: pisa+lø		
3RD	piš+et	piš+ut	PL: pisa+li		

The examples show that thematic verb stems undergo segmental changes in present tense forms. Dental consonants become strident palatals. Furthermore, in all of these verb stems, the theme vowel disappears throughout the present tense. In those with the suffix a, the stem-final consonant undergoes palatalization in all forms of the

present tense. In verbs with the theme vowels i and e, on the other hand, the stem-final consonant undergoes palatalization only in the 1st sg.⁵ I will have much more to say later on about the vowel deletion and palatalization rules affecting these verb stems since, as we will see, they play a crucial role in stress assignment.

There are four stress patterns associated with thematic verbs. While two of these patterns occur with all three types of thematic verbs, there is an asymmetry in the distribution of the other two. One pattern is restricted to those thematic verbs suffixed with a; another is limited to those suffixed with i and e. The data are summarized in (12). Each example includes three forms of the present tense and two of the past tense.

(12) Stress Patterns of Thematic Verbs

(i) PATTERN: fixed stress on the root

DISTRIBUTION: verb stems in a, i, and e⁶

EXAMPLE: videt' 'to see' STEM: vid + e

	<u>PRESENT</u>	<u>PAST</u>
1ST SG	víč+u	F: víde+la
3RD SG	vid+it	PL: víde+li
3RD PL	vid'+at	

(ii) PATTERN: stress on the stem-final vowel

DISTRIBUTION: verb stems in a⁷

EXAMPLE: kolebát' 'to rock' STEM: koleb + a

	<u>PRESENT</u>	<u>PAST</u>
1ST SG	koléb'l'+u	F: kolebá+la
3RD SG	koléb'l'+et	PL: kolebá+li
3RD PL	koléb'l'+ut	

(iii) PATTERN: stress on the inflection in the present; on the stem-final vowel in the past

DISTRIBUTION: verbs in i and e⁸

EXAMPLE: beredít' 'to irritate' STEM: bered + i

	<u>PRESENT</u>	<u>PAST</u>
1ST SG	berež+ú	F: beredí+la
3RD SG	bered+ít	PL: beredí+li
3RD PL	bered'+át	

(iv) PATTERN: stress on the inflection in the 1st sg, otherwise on the stem-final vowel

DISTRIBUTION: verbs in i, e, and a⁹

EXAMPLE: bormatát' 'to mutter' STEM: bormot + a

	<u>PRESENT</u>	<u>PAST</u>
1ST SG	bormoč+ú	F: bormotá+la
3RD SG	bormoč+et	PL: bormotá+li
3RD PL	bormoč+ut	

4.5.3 The Accentual Properties of Theme Vowel Suffixes

Let us begin with the following two assumptions. First, derived verbs are formed from the same four types of root morphemes as nonderived verbs and other lexical categories, namely: accented (Class

A), unaccented (Class C), post-accenting (Class B), and post-accenting with Retraction applying in a subset of forms (Class B'). Second, the suffixes i, e, and a are all [+accented, -dominant].¹⁰

Stress pattern (i) is the simplest case, with stress fixed on the root. We can account for these verbs by assuming that they have accented roots. Since the BAP assigns stress to the leftmost accented vowel, stress will fall on the root, rather than on an accented inflection.

The data in (12) reveal a striking asymmetry in the stress patterns of thematic verbs. While two of the patterns occur with all three types of thematic verb stems, pattern (ii) is confined to those with the suffixal vowel a and pattern (iii) is confined to those with the suffixal vowels i and e. I will show that this correlation between suffixal vowels and stress is not accidental.

Stress patterns (ii) and (iii) are identical in the past tense, with stress falling on the theme vowel suffix in all forms. What distinguishes the two patterns is the present tense, where the theme vowel suffix disappears. Pattern (ii) has stress fixed on the final vowel of the root while pattern (iii) has stress fixed on the inflection.

Suppose we make the following two assumptions. First, all theme vowel suffixes are accented. Second, verbs exhibiting either stress pattern (ii) or (iii) have unaccented roots. This would provide a very

simple account for the fact that both groups of verbs have stress on the theme suffix in the past tense. Since the theme suffix is the leftmost accented vowel, we correctly predict that it will surface with stress.

What we have yet to explain is why, when the theme suffix deletes, stress moves to the left when the suffix is a, but appears to move to the right when the suffix is either i or e.

4.6 Glide Formation and Accent Shift

4.6.1 Thematic Verbs

Let us consider what kind of stress pattern we expect if the root is unaccented and the theme vowel is accented. The BAP will apply on the second cycle (i.e. the cycle which introduces the theme vowel suffix), constructing an unbounded, right-headed foot on Line 0, with the suffixal vowel as head. Since the inflectional suffixes, which come last, are never accent-deleting, the vowel representing the theme suffix will always be the leftmost accented vowel in the word, and thus it should surface with stress. This will account for stress in the past tense of verbs like kolebát' (pattern (ii) in (12)).

In the present tense, the theme vowel never surfaces. Let us assume for the moment that there is a rule which eliminates vowel sequences by deleting the first vowel. This rule will have the effect of eliminating the representation on the stress plane of the affected vowel (i.e. it will eliminate the Line 0 asterisk associated with that segment). If, at the point in the derivation when the deletion rule applies, the affected vowel was head of a metrical constituent, then the accent (i.e. the Line 1 asterisk marking the head of the Line 0 constituent) will move to the adjacent vowel on the left. Stress will surface on the final vowel of the root.¹¹ The leftward movement of the accent follows from the assumption that Line 0 metrical constituents in Russian are right-headed.

This analysis accounts for the pattern shown in (12ii) above (e.g. kolebát' 'to rock'). In the past tense, the suffixal vowel surfaces in all forms and is always stressed (e.g. kolebála (f), kolebáli (pl)). In the present tense, the suffixal vowel is absent in all forms, and stress surfaces on the final vowel of the root (e.g. kolébl'u (1 sg), kolébl'et (3 sg), kolébl'ut (3 pl)). Let us assume, then, that verbs with stress pattern (ii) have unaccented roots.

A derivation of the f past tense is given in (13).

(13) Derivation of F Past Tense Form of Verb with Unaccented
Root and Theme Suffix a

kolebála 'she rocked'

UR: [[[[[koleb] a] l] a]

L1 *
L0 * * *
 | | |
CYCLE 2 [[XXXXX] X]
 | | | | |
 koleb a

BAP
L1 *
L0 (* * *)
 | | |
 [[XXXXX] X]
 | | | | |
 koleb a

L1 *
L0 (* * *)
 | | |
CYCLE 3 [[XXXXXX] X]
 | | | | |
 koleba l

BAP SCC

L1 * *
L0 (* * *) *
 | | | |
CYCLE 4 [[XXXXXXXX] X]
 | | | | |
 kolebal a

BAP
L1 *
L0 (* * *) *
 | | | |
 [[XXXXXXXX] X]
 | | | | |
 kolebal a

kolebála

In the present tense, vowel sequences occur in all forms. Although the analysis I sketched above, which posits a rule of Vowel Deletion, will account for present tense stress in verbs like kolebát', it does not explain the segmental changes which occur in the present tense stems of verbs ending in a. Therefore, we need to examine more closely the segmental and metrical properties of these present tense stems.

Consider the verb forms in (14).

(14) Segmental Changes in Verb Stems Ending in a

<u>INFINITIVE</u>	<u>PAST</u> (m)
ROOT + a + t'	ROOT + a + l + a
kolebat' 'to rock'	kolebala
dremat' 'to doze'	dremala
bormotat' 'to mutter'	bormotala
glodat' 'to gnaw'	glodala
pisat' 'to write'	pisala
paxat' 'to plough'	paxala
skakat' 'to skip'	skakala
<u>PRESENT</u> (1 sg)	<u>PRESENT</u> (3 sg)
ROOT + a + u	ROOT + a + e + t
kolebl'u	kolebl'et
dreml'u	dreml'et
bormoču	bormočet
gložu	gložet
pišu	pišet
pašu	pašet
skaču	skačet

Verb stems suffixed with a undergo certain changes in the present tense, which is precisely those forms in which the stem-final

suffixal vowel fails to surface. Both velar and dental consonants become strident palatals. Labial consonants do not undergo mutation. Instead, l is inserted after these consonants.

We have already seen that velars undergo mutation before a front vowel, i.e. before i and e, while dentals do not. The data in (15) illustrate this.

(15) Palatalization Before Front Vowels

(i) Velars

ráduga	'rainbow'	--	rádužina	'iris (eye)'
oréx	'nut'	--	oréšina	'hazle-nut grove'
pekú	'I bake'	--	pečëm	'we bake'
beregú	'I guard'	--	berežëm	'we guard'

(ii) Dentals

bolóta	'swamp'	--	bolótina	'swampy place'
gólos	'voice'	--	gososína	'strong voice'
želézo	'iron'	--	želézina	'piece of iron'
pletú	'I braid'	--	pletëm	'we braid'
kradú	'I steal'	--	kradëm	'we steal'

Like the rule of Dental Palatalization, the rule which inserts l after labials also does not apply before front vowels, as shown by the data in (16).

(16) Data Showing that l-Insertion is not Triggered by Front Vowels

xleb	'bread'	--	xlébina	aug. of 'bread'
krap	'specks'	--	krápina	'specks of different colors'
grebú	'I row'	--	grebëm	'we row'
žmú	'I squeeze'	--	žmëm	'we squeeze'

To account for velar-palatal alternations, I earlier adopted the following rule of Velar Palatalization (Vel Pal):

(17) Rule of Velar Palatalization (Vel Pal)

{k,g,x} ---> {č,ž,š} / ____ [-bk]

The question is what is triggering the consonant mutations in these forms.

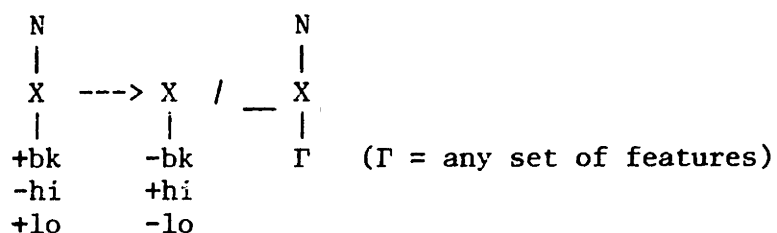
In Russian, both velar and dental obstruents shift to strident palatals when they occur before a high front glide (j), (i.e. t,k->č; d,g->ž; s,x->š; z->ž; ts->č). Labial consonants, on the other hand, do not undergo mutation. Instead, the clusters pj, bj, mj, vj, and fj are realized as p'l', b'l', m'l', v'l', and f'l'. These processes together are commonly referred to in Slavic phonology as Transitive Softening.

My earlier formulation of the Vel Pal rule stated only that the triggering segment be specified [-bk]. Therefore, this rule already captures the fact that the triggering segment for this particular rule can be either a high, front vowel or glide. However, given that Dental Palatalization (Den Pal) and l-Insertion (ϕ ->l) after labials only occur before a high, front glide, we need to posit a separate rule to account for these two processes. Since these processes apply in all present tense forms of verbs suffixed in a, we must account for the presence of a high, front glide in these forms.

Although the suffix a never surfaces in present tense forms, let us assume that it is always present in the underlying representation. Given that all present tense suffixes begin with a vowel, a vowel sequence occurs in the underlying representation of all present tense forms of verbs suffixed with a (but never in past tense forms, where the stem-final vowel is followed by a consonant). Specifically, we find the sequence a+u in the 1st sg and 3rd pl, and a+e elsewhere.¹²

In Russian, vowel sequences are eliminated.¹³ Sequences of a + V (V = any vowel) are eliminated by a process which changes a into a high, front glide. A formal representation of this Glide Formation rule, which I will label as a->j, is given in (18).

(18) Glide Formation (a->j)

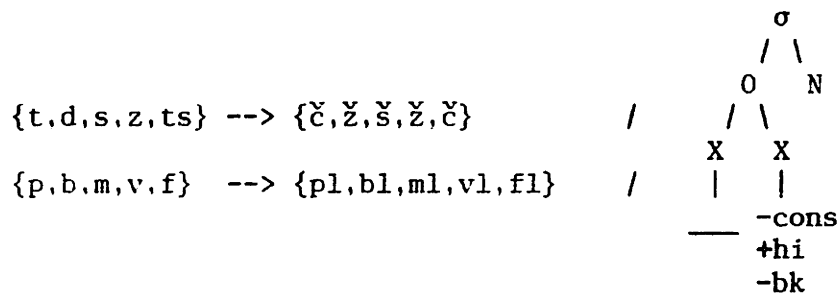


Note that this rule is not only feature-changing, but structure-changing as well.

My analysis assumes that the distinction between a high front vowel and a high front glide in Russian is purely structural.¹⁴ The defining property of a vowel is not a feature (i.e. [+voc]), but rather the association of a syllable nucleus with a timing slot in the

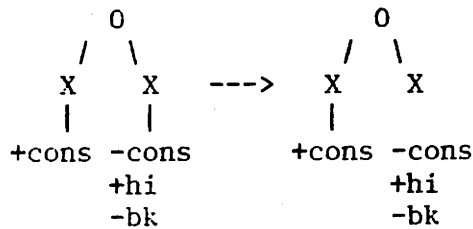
skeleton. On the segmental plane, i and j are indistinguishable. Given the fact that the rules of Den Pal and l-Insertion apply only before j, not before i, it must be the case that these segmental processes are subject to two conditions--one segmental and one structural. The segmental condition is that the triggering element must be specified [-cons, -bk]. The second condition involves syllable structure: the affected consonant and glide must, at the point when DEN PAL or l-insertion apply, both be contained in an onset. A descriptive formulation of these rules is given below.

(19) Rules of Dental Palatalization and l-Insertion



There is a rule which deletes j after a consonant. Since the distinction between a glide and vowel is one based on syllable structure, rather than segmental structure, this rule requires more than the presence of the feature [-cons]. I will assume that the rule of Glide Deletion also requires that the triggering consonant and glide both belong to an onset. The rule is shown in (20).

(20) Glide Deletion (j->ϕ)



There is evidence to show that the rule simply severs the association line between the X-slot and the segmental plane, rather than erasing the segmental features. There is a late rule of secondary palatalization, whereby consonants before a front vowel or glide are raised. The affected consonant does not change its place of articulation. Instead, a secondary articulation is introduced, whereby the back of the tongue is raised toward the soft palate, thus softening the consonant.

Glide Deletion does not apply morpheme-internally or across a prefix boundary, as shown by the examples in (21).

(21) Evidence that Glide Deletion (j->ϕ) Does Not Apply Morpheme Internally or Across Prefix Boundaries

p'jésa 'play'

p'j+ú 'I drink'

š'j+ú 'I sew'

vjexat' (prefix: v) 'to enter'

objátije (prefix: ob) 'embrace'

podjázyčnyj (prefix: pod) '(anat.) sub-lingual

This shows that the rule j->ϕ applies only in derived environments and thus is a cyclic rule.

The fact that vowel sequences are generally eliminated can be seen as a consequence of a syllable structure constraint which requires that word-internal syllables contain an onset. Without some process eliminating vowel sequences, present tense forms of verbs suffixed with a would violate this constraint, as the forms in (22) illustrate.

(22) Syllabification of 1st Sg and 3rd Pl Verb Forms, which Violates a Syllable Structure Constraint Requiring that Word-Internal Syllables Have an Onset

VERB: glodát' 'to gnaw'

<u>1ST SG</u>						<u>3RD SG</u>					
											σ
	σ		σ		σ		σ		σ		
/	\	/	\			/	\	/	\	R	
	R		R	R			R		R	/	\
O	N	O	N	N		O	N	O	N	N	C
/	\					/	\				
X	X	X	X	X	X	X	X	X	X	X	X
g	l	o	d	a	u	g	l	o	d	a	e t

The rule of Glide Formation prevents a syllable structure violation. After this rule has applied (on the 3rd cycle), resyllabification occurs, and the X-slot initially associated with the vowel a joins the root-final consonant in the onset. This is shown by the derivations in (23). The form is the 3rd sg of glodát 'to gnaw'. For simplification, I begin the derivation on the 3rd cycle and include the person marker t along with the tense marker in that cycle. I also ignore accents, since our main concern for the moment is the segmental

phonology (and syllabification, to the extent that it has consequences for the segmental phonology).

(23) Derivation of the Present Tense Form of a Thematic Verb
with Suffix a

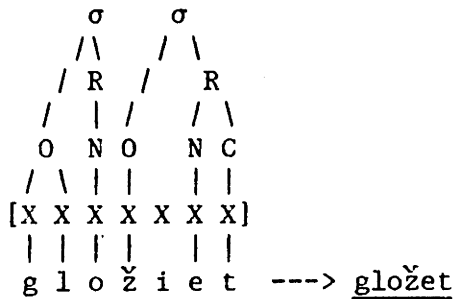
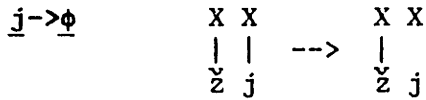
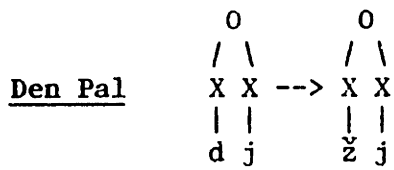
3RD SG: gložet 'it gnaws'

UR: [[[glod] a] et]

			σ		σ	
		/ \		/ \		
		R R		R R		
		O N O N		N		
	/ \					
<u>CYCLE 3</u>	[[X X X X X]	X X]				
	g l o d a	e t				

 σ
$$\begin{array}{ccccccc}
 & & \sigma & & & \sigma & \\
 & / & \backslash & & / & \backslash & \\
 & | & R & / & & R & \\
 & | & & | & / & & \backslash \\
 & O & N & O & N & C & \\
 / & \backslash & | & | & / & \backslash & | \\
 [[X & X & X & X & X] & X & X] \\
 | & | & | & | & | & | & | \\
 g & l & o & d & a & e & t
 \end{array}$$

$$\begin{array}{c} \text{N} \\ | \\ \underline{\text{a}} \rightarrow \underline{\text{j}} \quad \text{X} \quad \text{---} \rightarrow \quad \text{X} \quad \text{-----} \rightarrow \\ | \\ \text{+bk} \quad \text{-bk} \\ \text{-hi} \quad \text{+hi} \\ \text{+lo} \end{array}$$



Now let us return to the problem of stress and consider once again stress pattern (iii) in (12) (e.g. kolebát'). Recall that this pattern occurs only in verbs whose stems end in a. For convenience, I repeat the paradigm in (24).

(24) Stress Pattern of a Verb with an Unaccented Root and Accented Suffix a

Example: kolebát' 'to rock'

	<u>PRESENT</u>	<u>PAST</u>
1ST SG	kolébl'+u	F: kolebá+la
3RD SG	kolébl'+eř	PL: kolebá+li
3RD PL	kolébl'+at	

Given my earlier assumption that verbs with this pattern have unaccented roots, and that the suffix a is accented, consider the effect that the rule of Glide Formation (a->j) will have on stress assignment.

On the second cycle of present tense forms, the BAP constructs an unbounded, right-headed metrical constituent on Line 0, with the suffixal vowel a as head. On the third cycle, the rule $a \rightarrow j$ applies, triggered by the vowel belonging to the inflectional suffix. This rule changes the features of the theme suffix vowel from $[+bk, -hi, +lo]$ to $[-bk, +hi, -lo]$, and severs the association between the skeletal slot and the nucleus. Since only nuclear elements are represented on the stress plane, this rule has the effect of eliminating the representation of the vowel a on the stress plane. If this vowel was head of a Line 0 constituent, the accent associated with it will shift to the left, due to the fact that metrical feet are right-headed in Russian. Therefore, stress surfaces on the final vowel of the root.

Derivations are given in (25). With each rule application in the derivations below, I include only those aspects of the representation which are relevant to a particular rule. Thus, for example, I indicate syllable structure, but not stress, at the point at which l-Insertion ($\phi \rightarrow \underline{l}$) applies, since I have argued that syllable structure is a condition on this rule. Metrical structure neither affects nor is affected by this rule. On the other hand, metrical structure is shown when the rule $a \rightarrow j$ applies, since this rule does play a role in stress assignment. I have further simplified the derivations by including Conflation as part of the BAP.

(25) Derivations of Present Tense Forms of kolebát'

Verb: kolebát' 'to rock'

Root: [koleb] (-acc)

Theme Suffix: [a] (+acc)

Tense Suffix: [e] (+acc)

1st Sg Agreement Suffix: [u] (+acc)

1ST SG: kcléb'l'u

UR: [[[koleb] a] u]

	L1		*
	L0	* *	*
<u>CYCLE 2</u>		[[XXXXX] X]	
		koleb	a

BAP

	L1		*
	L0	(* * *)	*
		[[XXXXX] X]	
		koleb	a

	L1		*	*
	L0	(* * *)	*	*
<u>CYCLE 3</u>		[[XXXXXX] X]		
		koleba	u	

BAP

	L1		*
	L0	(* * *)	*
		[[XXXXXX] X]	
		koleba	u

a->j

N
|
X -> X
|
+bk -bk
-hi +hi
+lo -lo

L1 *
L0 (* *) *
| | |
{[XXXXXX] X}
| | | | |
kolebj u

φ->1

0 0
/ \ / \
X X -> X X X
| | |
b j b l j

σ σ σ
/ \ / \ / \
/ R / R / R
| | | | |
O N O N / | \ N
| | | | |
[X X X X X X X] X
| | | | |
k o l e b l j u

j->φ

0 0
/ \ / \
X X X -> X X X
| | |
b l j b l j

POST-CYCLIC

L1 *
L0 (* *) *
| | |
[XXXXXXXX]
| | | | |
koleblju

C->C'

X X X -> X X X
| | |
b l i b 'l'j

koléb'l'u

3RD SG: koléb'l'et

UR: [[[koleb] a] et]

CYCLE 3

L1		*	*
L0	(*	*	*) *
	[[XXXXXX]	XX]	
	koleba	et	

BAP

L1		*	
L0	(*	*	*) *
	[[XXXXXX]	XX]	
	koleba	et	

a->j

N				*		
				(*	*)	*
X	->	X	----->	[[XXXXXX]	XX]	
+bk		-bk		kolebj	et	
-hi		+hi				
+lo		-lo				

OTHER RULES:

$\phi \rightarrow l$

$j \rightarrow \phi$

$C \rightarrow C'$

L1		*	
L0	(*	*	*) *
	[XXXXXXXXXX]		
	kolebljet		

koléb'l'et 'it rocks'

4.6.2 Further Evidence: Verbs with the Suffix ova

The analysis presented above extends to a very large class of verbs derived with the suffix ova. There are two stress patterns which occur among verbs derived with this suffix. Some verbs have stress fixed on a root vowel. Others have stress on the stem-final vowel. In the past tense, the stem-final vowel is a. In the present tense, where Glide Formation applies, the stem-final vowel is u. Each pattern is illustrated below.

(26) Stress Patterns of Verbs with the Suffix ova

- (i) trébovat 'to demand'
Stem: treb + ova

	<u>PRESENT</u>	<u>PAST</u>
1ST SG	trébuju	F: trébovala
3RD SG	trébujet	PL: trébovali
3RD PL	trébujut	

- (ii) risovát 'to draw'
Stem: ris + ova

	<u>PRESENT</u>	<u>PAST</u>
1SG SG	risúju	F: risovála
3RD SG	risújet	PL: risovíli
3RD PL	risújut	

I have argued that the distinction between a high front vowel and glide is purely structural. Both are specified [-cons, +hi, -lo, -back]. The vowel i is associated with a syllable nucleus, while the glide j is not. I will assume the same distinction between the high, back vowel u and glide w.

In Russian, the consonant v derives from underlying w.

Therefore, I will assume that the suffix ova contains a high, back glide. Furthermore, I will assume that the suffix is accented, with the accent associated with the vowel a. The underlying representation is given in (27).

(27) Underlying Representation of the Suffix ova

N	N		L1	*
			L0	*
X	X	X	<--->	X
				X
o	u	a		X
				o
				u
				a

If the root is unaccented, then on the second cycle the BAP will construct an unbounded, right-headed constituent on Line 0, with the suffixal vowel a as head. This is illustrated below, with the verb *risovát'*. I show both syllable structure and metrical structure.

(28)

[illegible]

In the past tense, the inflection begins with a consonant. The only segmental change that occurs in the stem is that w becomes v. Syllabification of a past tense form is shown below.

(29) Syllabification of the Past Tense Stem

	σ		σ		σ		σ
	/ \	/ \	/ \	/ \	/ \	/ \	
		R	O	R	O	R	O
	O	N	O	N	O	N	O
	[X	X	X	X	X	X	X]
	r	i	s	o	w	a	l
	a						

Stress will surface on the accented suffixal vowel of the stem

(a) if the root is unaccented: risovála (f), risováli (pl). The derivation of the f past tense is shown below.

(30) Derivation of F Past Tense

risovála 'she drew'

UR: [[[[ris] owa] l] a]

L1 *

L0 * * *

| |

CYCLE 2 [[XXX] XXX]

||| |||

ris owa

BAP

L1 *

L0 (* * *)

| |

[[XXX] XXX]

||| |||

ris owa

L1 *

L0 (* * *)

| |

CYCLE 3 [[XXXXXX] X]

||||| |

risowa l

BAP SCC


```

      L1      *      *
      L0  (* * *)  *
          | | | |
CYCLE 4  [[XXXXXXX] X]
          ||||| |
          risowal a

```

```

      L1      *
      L0  (* * *)  *
          | | | |
BAP      [[XXXXXXX] X]
          ||||| |
          risowal a

```

risovála

The present tense inflections, however, all begin with a vowel. Thus, the third cycle of present tense forms produces an underlying vowel sequence. Given my earlier assumption that the present tense suffix (e) is absent in the 1st sg and 3rd pl, the vowel sequences will be a+u in the 1st sg and 3rd pl (u and ut being the 1st sg and 3rd pl agreement suffixes), and a+e in the other forms. This is illustrated below.

(31)

	SG	PL
1ST	risowa <u>+</u> u	risowa+em
2ND	risowa+eš	risowa+ete
3RD	risowa+et	risowa+ut

Glide Formation will apply to the vowel a, just as it does in thematic verb stems ending in a. Because it loses its status as a syllable nucleus, its representation on the stress plane is eliminated. In verbs with unaccented roots, the suffixal vowel a is the leftmost accented element. At the point in the derivation when Glide Formation

applies, a is head of a Line 0 constituent. Elimination of its position in the metrical grid causes the Line 1 asterisk (i.e. the accent associated with a) to shift to the left.

Given my assumption that the underlying high, back segment in the suffix ova (owa) is a glide, it is not underlyingly associated with a syllable nucleus. Therefore it is not represented on the stress plane (see the representation in (28)). However, the vowel which surfaces with stress is phonetically u.

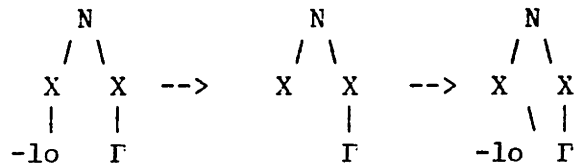
Resyllabification occurs after Glide Formation applies to the vowel a. The [-cons. +hi, +bk] segment (w) loses its onset position. I will stipulate that a sequence of [-cons] segments within a rhyme is incorporated into a branching nucleus.¹⁵ Thus, as shown in the derivation above, the segments o and u form a branching nucleus.

To account for the fact that the stressed vowel surfaces as u, let us assume that the initial position in a branching nucleus is head. There are two different ways in which vowel sequences are eliminated. If the initial vowel in the sequence is [+lo] (e.g. a) Glide Formation applies, as we have already seen. If the initial vowel is [-lo], however, Deletion occurs. Vowel Deletion severs the association between the feature specification of the vowel on the segmental plane and the skeleton, but does not eliminate the skeletal position of the vowel. Compensatory Lengthening then applies, associating the features of the second vowel to the X-slot of the first. Since there is no clear

evidence of long and short vowel distinctions in Russian, I will assume a later rule of Degemination (Degem), which eliminates the second position in a branching nucleus dominating a geminate vowel.

Vowel Deletion ($V \rightarrow \phi$) and Compensatory Lengthening ($V \rightarrow V:$) are shown in (32).

(32) Vowel Deletion ($V \rightarrow \phi$)



(Γ = any set of features which includes the specification [-cons])

I assume that a geminate vowel is represented as a single element on the stress plane. Glide Formation, however, eliminates a branching nucleus. The accent associated with the affected vowel moves to the left.

A derivation of the 3rd sg form, risújet, is given in (33). I begin on the third cycle.¹⁶

(33) Glide Formation, Accent Shift, and Resyllabification

risújet 'he/she draws'

UR: [[[[ris] owa] e] t]

	σ	σ	σ			
	/ \	/ \	/ \			
	R	R	R			
	O N O	N O N	O N			
<u>CYCLE 3</u>	[[X X X X X X] X X]			<--->	[[XXXXXX] XX]	
	r i s	o w a	e t		r i s o w a	e t

σ						
	σ	σ		σ		
	/ \	/ \		/ \		
	R	R	/	R		
				N		
	O N O	N O N	O	/ \	C	
	[[X X X X X X] X X]			<--->	[[XXXXXX] XX]	
	r i s	o w a	e t		r i s o w a	e t

BAP

4.6.3 Summary

I began by observing that thematic verbs exhibit four distinct stress patterns. One of these is characterized by stress on the theme vowel suffix in those forms in which it surfaces (i.e. in the past tense), and on the root-final vowel when the theme vowel suffix is absent in surface form (i.e. in the present tense). I noted that among thematic verbs, only those ending in the vowel a exhibit this pattern.

I argued that this pattern results from affixation of an accented suffix to an unaccented root. The theme vowel surfaces in past tense forms, where the inflectional suffix begins with a consonant. However, in the present tense, a vowel sequence results from affixation of the inflectional suffix. In verb stems ending in a, this triggers a rule of Glide Formation (a->j) (one of the processes which eliminates sequences of vowels). Given my assumption that theme vowel suffixes are accented, we correctly predict that stress will fall on this suffixal vowel in the past tense if the root is unaccented. If the vowel undergoes Glide Formation, resyllabification occurs and the accent moves to the left.

I showed that this analysis predicts the stress properties of verb stems ending in the suffix owa (ova). A further complication in these derived verbs is the ow/u alternation.

I posited a syllabification rule which incorporates a sequence of rhyme-internal [-cons] segments into a branching nucleus. The initial position is head of the nucleus. Vowel deletion applies to the first in a sequence of vowels. This rule severs the association between the segmental features of the vowel and its skeletal position. In the sequence ou, o deletes, followed by Compensatory Lengthening of the second vowel u. Since the syllabic representation of the first vowel is preserved, its representation on the stress plane is unaffected. The accent remains associated with this segment, but its phonetic features are derived from the following vowel.

This analysis accounts for stress assignment in verbs with unaccented roots which are derived either with the theme vowel suffix a or with the productive verbal suffix owa.

4.7 Vowel Deletion and Accent Shift

4.7.1 Thematic Verb Stems Ending in a [-lo] Vowel

Now let us turn to the remaining two stress patterns of thematic verbs, repeated below.

(34) Stress Patterns (iii) & (iv) of Thematic Verbs

- (iii) Pattern: Stress on the final syllable in the present; on the penult in the past

Distribution: Derived verb stems ending in i or e

Example: beredít' 'to irritate'

<u>PRESENT</u>	<u>PAST</u>
1ST SG: berež+ú	F: beredí+la
3RD SG: bered+ít	PL: beredí+li
3RD PL: bered'+át	

- (iv) Pattern: Stress on the final syllable in the 1st sg pres. tense; elsewhere on the penult

Distribution: Derived verb stems ending in a, i, or e

bormotát' 'to murmur'

<u>PRESENT</u>	<u>PAST</u>
1ST SG: bormoč+ú	F: bormotá+la
3RD SG: bormóč+et	PL: bormotá+li
3RD PL: bormóč+ut	

At first glance, the most obvious hypothesis might seem to be that verbs of both groups have post-accenting roots, the difference between them being that verbs of type (iv) are subject to Retraction in all forms of the present tense except the 1st sg. However, this analysis of stress pattern (iii) would imply that the correlation between thematic vowels and stress, noted earlier, is accidental.

Concentrating for the moment on pattern (iii), I will argue that this pattern occurs with both unaccented and post-accenting roots.

Before proceeding with my analysis of these verbs, I will summarize my assumptions about the relation between the accentual properties of root morphemes and the stress patterns of thematic verbs. This is given in (35).

(35) Accentual Properties of Root Morphemes and Thematic Stress in Thematic Verbs

	<u>PATTERN</u>	<u>THEME SUFFIXES</u>	<u>ACCENTUAL CLASS OF ROOT</u>
(i)	fixed on root	i, e, a	A
(ii)	on stem-final vowel: theme suffix vowel when present, otherwise on root-final vowel	a	C
(iii)	on infl in present; on stem-final vowel in past	i, e i, e	B C
(iv)	on infl in 1st sg; otherwise on stem-final vowel	i, e, a	B'

Let us assume for the moment that my claim that stress pattern (iii) results from two different conditions is correct, and that one of those conditions occurs when verbs suffixed with i and e have unaccented roots. Since theme vowel suffixes are accented, we correctly predict that stress will fall on the stem-final vowel in all forms in which this vowel surfaces (i.e. the past tense).

What is problematic for my analysis is the fact that in present tense forms, stress falls on the vowel following the theme vowel suffix

in the underlying representation (i.e. on the inflectional suffix).

Since Line 0 metrical constituents are right-headed, my analysis predicts that deletion of the head should result in the accent shifting to the left. Thus we expect stress to surface on the stem-final vowel.

In derived verb stems ending in a, affixation of present tense suffixes produces vowel sequences which trigger a rule of Glide Formation (a->j). This accounts not only for the leftward shift of the accent, but for consonant mutation processes as well. Velar and dental obstruents become strident palatals, while l is inserted after labials.

In verbs suffixed with i or e, consonant mutation occurs only in the 1st sg. To see why, let us examine the vowel sequences which occur in the present tense of these verbs. These are summarized in (36).¹⁷

(36) Vowel Sequences in the Present Tense of Verbs with Stems Suffixed with i and e

	SG	PL
1ST	iu / eu	ii / ei
2ND	ii / ei	ii / ei
3RD	ii / ei	int / ent

In my analysis of verbs derived with the suffix ova, I argued that vowel sequences are eliminated in one of two ways, depending on whether the first vowel is specified [+lo] or [-lo]. A sequence initial [+lo] vowel undergoes Glide Formation. A sequence initial [-lo] vowel deletes. Vowel Deletion will apply to all of the vowel sequences shown in (36). However, we need to revise the earlier formulation of the rule

in order to account for the pattern of consonant mutation in verb stems ending in i and e.

I have pointed out that the rules of Den Pal and l-Insertion do not apply under the same conditions as Vel Pal. The latter occurs before a [-bk] vowel or glide, while the former require that the consonant and [-bk] segment share an onset position. The difference is illustrated by the verb paradigms below.

(37) Consonant Mutation in Verb Stems Suffixed with i and e

(i) VERB STEMS IN i

(a) <u>družít'</u>		SG	PL
Stem: [drug+i]	1ST	družú	družím
'to be friends with'	2ND	družíš	družíte
(Velar Palatalization)	3RD	družít	družát
(b) <u>beredít'</u>		SG	PL
Stem: [bered+i]	1ST	berežú	beredím
'to irritate'	2ND	beredíš	beredíte
(Dental Palatalization)	3RD	beredít	bered'át
(c) <u>glupít'</u>		SG	PL
Stem: [glup+i]	1ST	glupl'ú	glupím
'to make a fool of'	2ND	glupíš	glupít
(<u>l</u> -Insertion)	3RD	glupít	glup'át

(ii) VERB STEMS IN e

(a) <u>zvučat'</u>		SG	PL
Stem: [zvuk+e]	1ST	zvučú	zvučím
'to be heard'	2ND	zvučíš	zvučíte
(Velar Palatalization)	3RD	zvučít	zvučát
(b) <u>sidét'</u>		SG	PL
Stem: [sid+e]	1ST	sižú	sidím
'to sit'	2ND	sidíš	sidíte
(Dental Palatalization)	3RD	sidít	sid'át
(c) <u>kipét'</u>		SG	PL
Stem: [kip+e]	1ST	kipl'ú	kipím
'to boil'	2ND	kipíš	kipíte
(<u>l</u> -Insertion)	3RD	kipít	kip'át

Den Pal and l-Insertion occur before vowel sequences i+u and e+u, not before e+i or i+i.

To account for this, let us assume that the segmental features of the first vowel are deleted from the representation when the two [-lo] vowels have the same specification for the feature [±bk] (i.e. i+i, e+i, o+u).¹⁸ If the two adjacent vowels differ for the feature [±bk], the association line between the skeleton and segmental plane is severed but the features remain. The features of the delinked [-lo] vowel are then free to associate to the preceding consonant, triggering palatalization of velars and dentals or l-insertion after labials.¹⁹

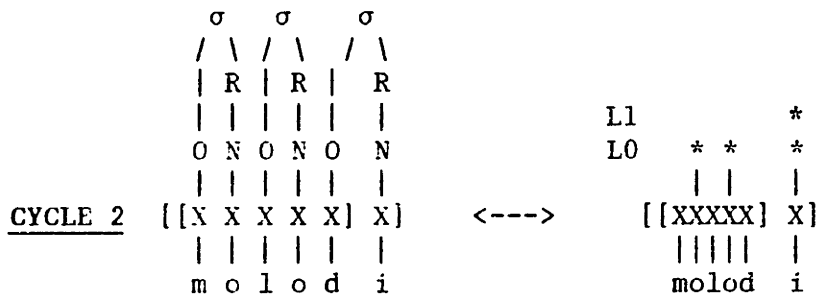
To see how this analysis works, consider the verb molodít' 'to make look younger'. The root [molod] is unaccented.²⁰ A derivation of the 1st sg, moložú, is shown in (38). I show in parallel representations of syllable structure and metrical structure. Recall that I have argued

that in Russian word-internal syllables must have an onset. I will assume that a geminate vowel is represented as one element on the stress plane.

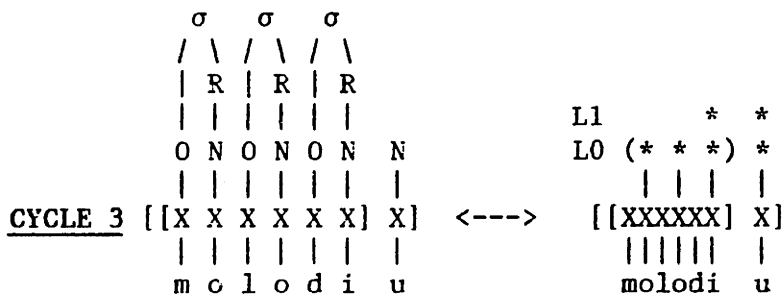
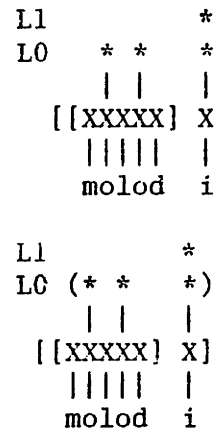
(38) Derivation

molozhú 'I make (someone) look younger'

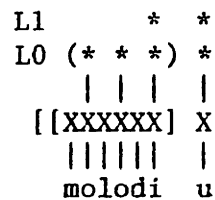
UR: [[molod] i] u]



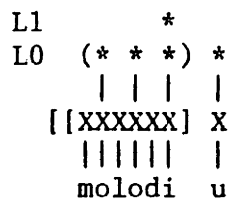
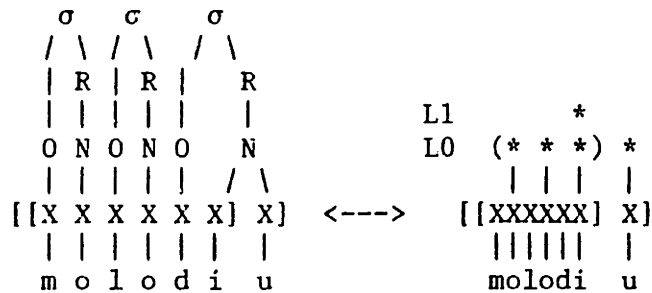
BAP



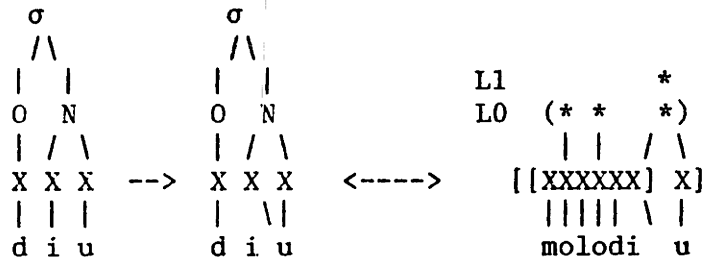
BAP



σ



V->ϕ & V->V:



The delinked feature matrix [-cons, +hi, -lo, -back] remains on segmental plane. We can account for the fact that Den Pal applies in this form by linking the place features [+hi, -bk] to the feature matrix of the consonant. I will represent this simply by linking the features of floating vowel to the skeletal slot of the preceding consonant. Den Pal and l-Insertion will then apply, producing the segmental changes shown below. I use the symbol j in the table and derivations below to represent a nonsyllabic segment specified [-cons, +hi, -bk].

(39) Dental Palatalization and l-Insertion

(i) Dental Palatalization

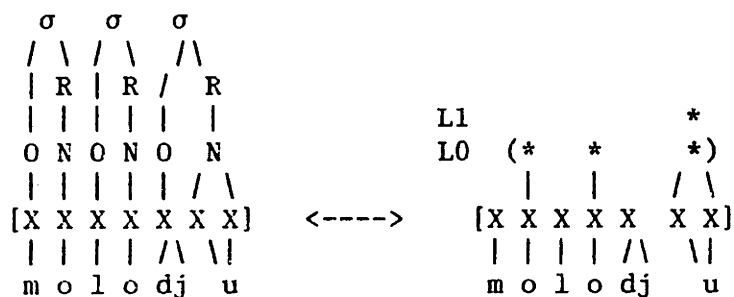
O	
X	
/ \	
t j	--> č
d j	--> ž
s j	--> š
z j	--> ž

(ii) l-Insertion

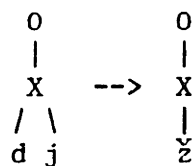
O	
X	
/ \	
p j	--> pl
b j	--> bl
m j	--> ml
f j	--> fl
v j	--> vl

The final stage of the derivation of moložu is as shown below. I assume that degemination applies to the vowel u.

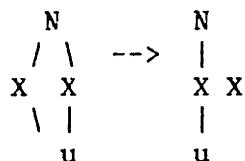
(40)



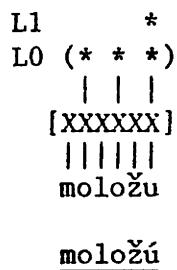
Den Pal



Degem



Final Form:



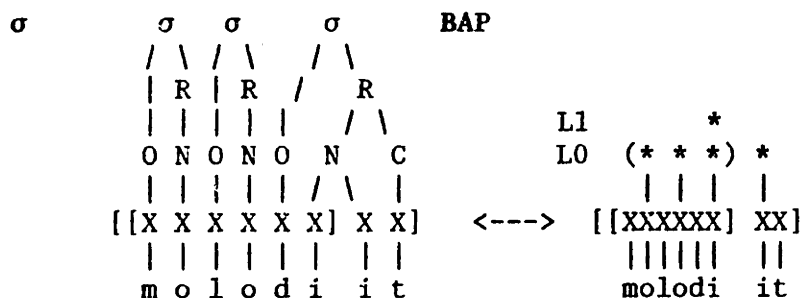
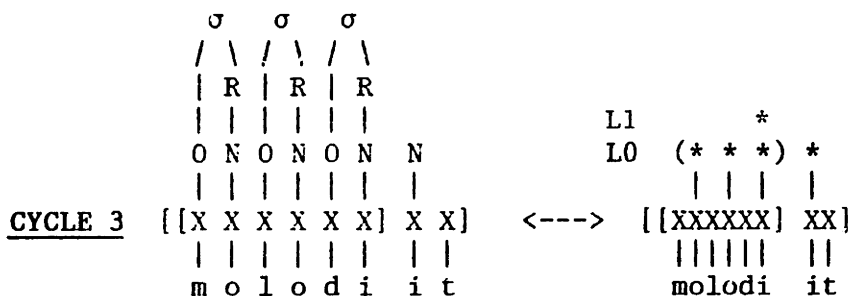
What is crucial in this analysis is the fact that throughout the derivation the accent remains associated with the X-slot representing the theme vowel suffix. On the surface, the accent only **appears** to have shifted to the right, because the theme vowel acquires the **segmental** features of the following vowel (in this instance, u).

In all other forms except the 3rd pl, the vowel sequence i+i or e+i occurs (Theme Vowel + Tense Suffix). The features of the first vowel delete. Since there is no [+hi, -lo, -back] floating segment in these forms, Dental Palatalization and l-Insertion do not apply. A derivation of the 3rd sg of molodít' (molodít) is given below. I begin with the third cycle.

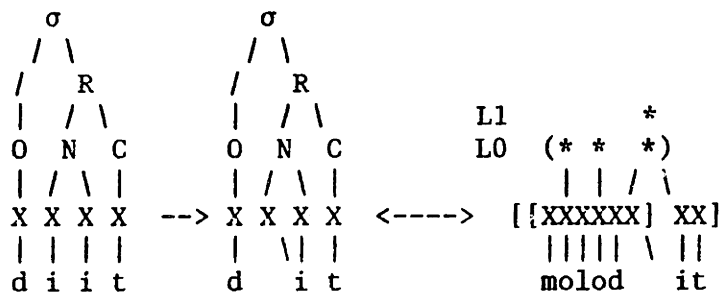
(41) Derivation

molodít 'he/she makes (someone) look younger'

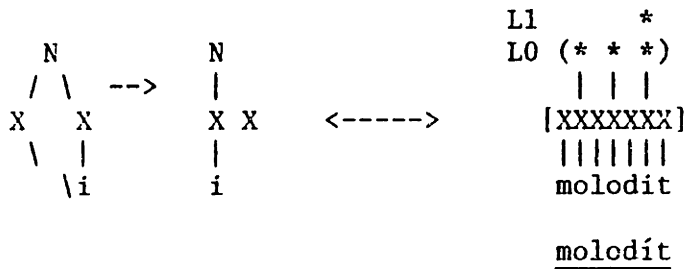
UR: [[[molod] i] it]



V->φ & V->V:



Degem



4.7.1.1 The Underlying Form of the 3rd Pl Agreement Suffix

Now let us consider the 3rd pl. Compare the 1st sg and 3rd pl forms of verbs suffixed with a, on one hand, with those of verbs suffixed with i or e, shown below.

(42) 1st Sg and 3rd Pl Forms of Thematic Verbs

<u>VERB</u>		<u>THEME SUFFIX</u>	<u>1ST SG</u>	<u>3RD PL</u>
bormotát'	'to mutter'	a	bormočú	bormóčut
molodít'	'to make look younger'	i	moložú	molod'át
sidét'	'to sit'	e	sižú	sid'át

Unlike the 1st sg agreement suffix, which is the same for all verbs, the 3rd pl suffix exhibits two different forms: ut with verbs

suffixed with a (and athematic verbs), but at with verbs suffixed with i and e. I have assumed that the 1st sg suffix is underlyingly a vowel with the features [+bk, +hi], and that the underlying form of 3rd pl allomorph ut includes this same vowel (u) plus the consonant t. Recall that I have argued that the 1st sg and 3rd pl forms lack a present tense suffix.

Verbs suffixed with i or e exhibit mutation of the root-final consonant only in the 1st sg. I argued that Dental Palatalization and l-Insertion require a [-lo] segment which is either floating or shares the onset with the affected consonant.

Suppose we were to assume that the underlying form of the 3rd pl allomorph at consists of a vowel specified [+bk, +lo] and the consonant t, and that the vowel is accented. Second conjugation thematic verbs would have the following composition in the 3rd pl: [[[root] i/e] at]. To take a specific example, the 3rd pl of the verb molodit' would have the underlying form shown in (43).

(43) Underlying Form of 3rd Pl of Second Conjugation
Thematic Verb

					L1					*
					L0		*	*	*	*
N	N		N	N						
[[[XXXXX]	X]		XX]		<---->		[[[XXXXX]	X]	XX]	
molod		i		at			molod		i	at

The rule [-lo]->φ will apply, delinking the features of the high, front vowel i. The stressed vowel will thus correctly be

specified [+lo, +bk]. However, since the two vowels do not share the same specification for either height or backness, the features of the vowel i remain on the segmental plane. We then incorrectly predict that Den Pal will apply, as it does in the 1st sg.

To solve this problem, I will argue that the underlying form of the 3rd pl agreement suffix selected by verbs ending in a [-lo] vowel is nt, rather than at. The 3rd pl form of molodít' would then have the underlying form shown in (44).

(44)

	N	N	N			1.1		*	
						0	(*	*)	
[[X	X	X	X	X	X]	X	X]	<--->	[[XXXXXXX] xx]
n	e	l	o	d	i	n	t		molodi nt

I will assume a rule which changes a vowel to a when it is tautosyllabic with a following nasal (V->a).²¹ Another rule deletes a nasal before a tautosyllabic consonant.

Examples of words in which a vowel + nasal sequence alternates with a are shown in (45).

(45) Alternations of Vowel+Nasal Sequences and a

lisënok [lis + en + ok] (nom sg) (m) 'fox-cub'
lis'áta [lis + en + t + a] (nom pl)

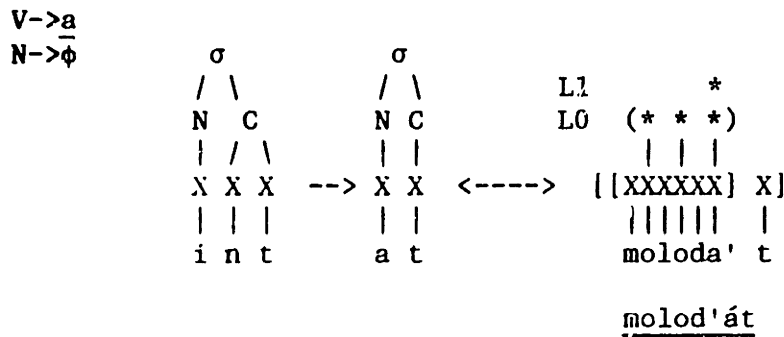
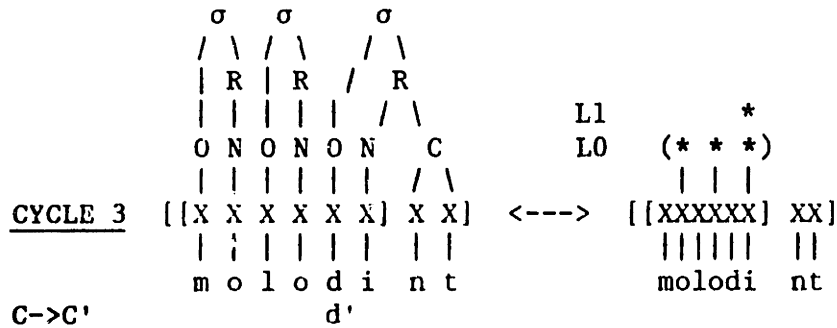
vrémeni [vrem + en + i] (nom pl) (n) 'time'
vrém'a [vrem + en] (nom sg)

Derivation of the 3rd pl of molodít' is given below.

(46) Derivation

3RD PL: molod'át 'they make look younger'

UR: [[[molod] i] nt]



4.7.2 Post-Accentuation in Thematic Verbs

The reader will recall that in my analysis of nominal and adjectival stress, I used the stress patterns of related nonderived forms as independent evidence for the accentual property of root morphemes in derived forms. Since theme suffixes attach to roots of all lexical categories, we should be able to use this method to verify my hypothesis about stress pattern (iii) (discussed in the previous section). In particular, we should expect to find that nonderived nouns

and adjectives which are related to thematic verbs suffixed with i and e which exhibit pattern (iii), have mobile stress.

The correlations are not, in fact, as close as we would expect. While a large number of thematic verbs with stress pattern (iii) are indeed related to nonderived nouns or adjectives with mobile stress, there are many which are related to nonderived words with stress fixed on the inflection, indicating that the roots are post-accenting.²² Several examples are given in the appendix to this section.

Next I will show that my analysis predicts that derived verbs whose roots are post-accenting will have precisely the same stress pattern as thematic verbs suffix with i and e whose roots are unaccented.

Consider the verb plodít 'to procreate'. There is a nonderived noun, plod, meaning 'fruit', which has stress fixed on the inflection: plod+á (gen sg), plod+ú (dat sg), plod+y[^] (nom pl). This suggests that the verb root is nominal and post-accenting. The underlying representation of the root is shown in (47). Recall that the subscript p is a feature identifying a morpheme as post-accenting.

(47) Underlying Representation of the Post-Accenting Root [plod]

```

L1      *
L0      *
  |
[XXXX]p
  |||
  plod

```

The second cycle introduces the accented theme suffix i. The BAP applies, constructing a Line 0 constituent consisting of the leftmost accented vowel. The post-accenting property of the root percolates to become a property of the derived stem. The same thing happens on the third and fourth cycles. A derivation of the f past tense of plodít is shown in (48). I show the output of the BAP after Conflation.

(48) Derivation

plodíla 'she produced'

UR: {[[[plod] i] l] a}

	L1	*	*
	L0	*	*
<u>CYCLE 2</u>		{[XXXX] _p	X}
		plod	i

BAP

	L1	*
	L0	(*)
		{[XXXX] _p
		plod

```

      L1  *
      L0  (*)*
          | |
CYCLE 3  [[XXXXXX]P X]
          ||||| |
          plodi  1

```

BAP SCC

```

      L1  *      *
      L0  (*)*    *
          | |      |
CYCLE 4  [[XXXXXX]P X]
          ||||| |
          plodil  a

```

BAP

```

      L1  *
      L0  (*)*    *
          | |      |
          [[XXXXXX]P X]
          ||||| |
          plodil  a

```

```

      L1  *
      L0  (*)* *
          | | |
POST-CYCLIC  [XXXXXXX]P
          ||||| |
          plodila

```

```

      L1  *
      L0  (* *)*
          | | |
*->      [XXXXXXX]
          ||||| |
          plodila

          plodila

```

Although Post-Accentuation is a morphologically-triggered rule, I argued in Chapter 1 that it is generally subject to the condition that the vowel transferring the accent is penultimate.

This is illustrated by the following pair of related nouns: (i) stólb (B) 'pillar' and (ii) stólbik (A) 'dim. of stólb'. The nonderived noun has fixed stress on the inflection, indicating that the root is post-accenting. In the derived noun stólbik, however, stress remains on the accented root vowel.

According to the analysis of thematic verbs given above, Post-Accentuation would have to be allowed to apply when the accented vowel is not penultimate. However, we do have a precedent for this. Recall that in the adjectival system, there are two derivational suffixes, ist and liv, which deviate from most derivational suffixes in their failure to block Post-Accentuation. Both of these suffixes are [+accented, -dominant]. Most suffixes with this accentual property will only get stress under one condition: when they attach to an unaccented root. However, in the case of the adjectival suffixes ist and liv, there are two conditions under which they will surface with stress: (i) when they attach to an unaccented root; and (ii) when they attach to a post-accenting root or derived stem whose final suffix is post-accenting. In the latter case, these suffixes get stress through transfer of the accent from the adjacent vowel on the left. Some examples from Chapter 3 are repeated below.

(49) Adjectives Derived with the Suffixes ist and liv

(i) ist (+accented)

<u>BASE NOUN</u>	<u>DERIVED ADJECTIVE</u>	
poróda (A) 'breed'	poródist+yj	'thoroughbred'
glína (A) 'clay'	glínist+yj	'argillaceous'
xólm (B) 'hill'	xolmíst+yj	'hilly'
lúč (B) 'ray'	lučíst+yj	'radiant'
kúst (B) 'bush'	kustíst+yj	'bushy'
gorá (C) 'mountain'	goríst+yj	'mountainous'
volná (C) 'wave'	volníst+yj	'wavy'

(ii) liv (+accented)

<u>BASE NOUN</u>	<u>DERIVED ADJECTIVE</u>	
sóvest' (A) 'conscience'	sóvestliv+yj	'conscientious'
zabóta (A) 'care'	zabótliv+yj	'solicitous'
dožd' (B) 'rain'	doždíiv+yj	'rainy'
toská (B) 'depression'	tosklív+yj	'melancholy'
xlópoty (C) (no sg) 'trouble'	xlopotlív+yj	'exacting'

Although the conditions under which Post-Accentuation applies may vary, the accent never shifts more than one syllable.

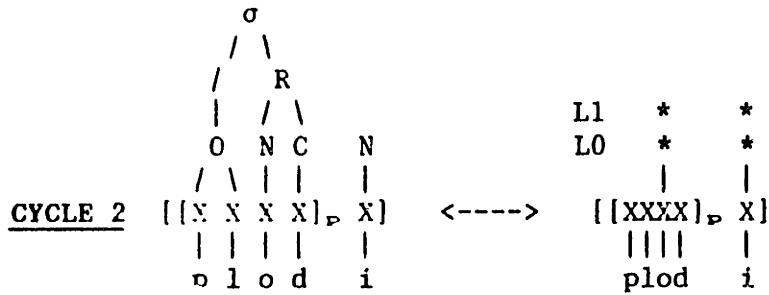
Since Post-Accentuation applies post-cyclically, in present tense forms Vowel Deletion or Glide Deletion will apply first. Thus the accent will shift to the final syllable of the word.

Derivation of the 3rd sg present tense of plodít is given in (50).

(50) Derivation

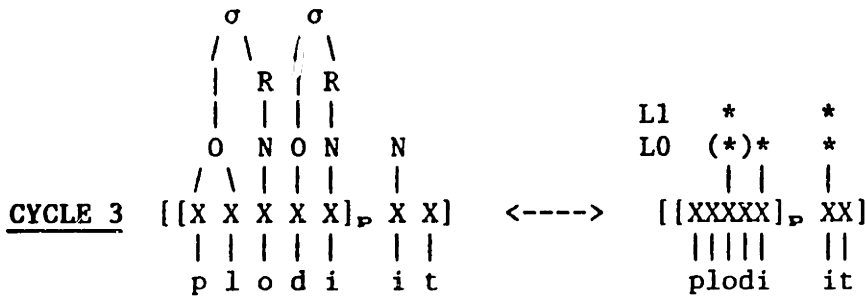
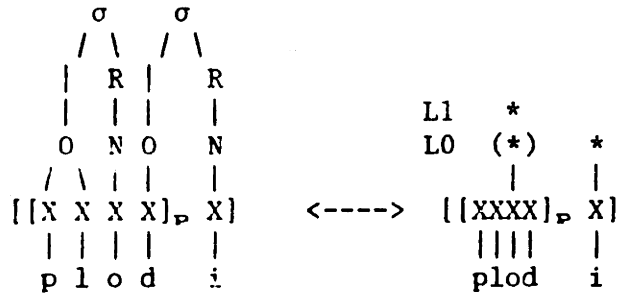
plodit 'he/she produces'

UR: [[[plod] i] it]



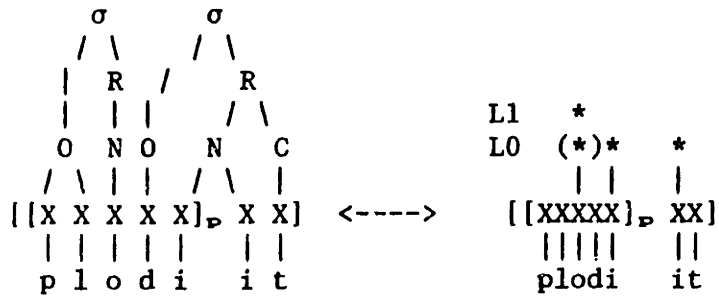
σ

BAP

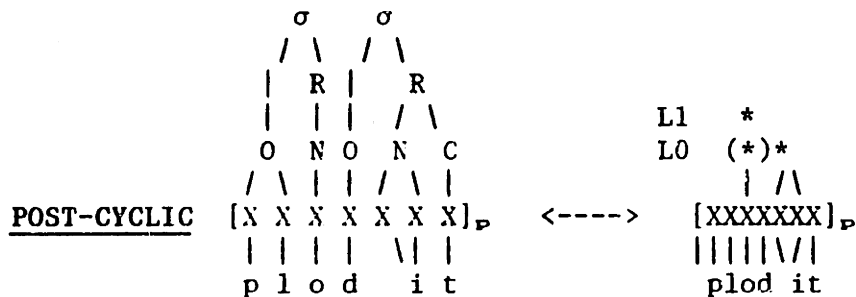
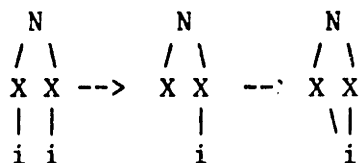


σ

BAP

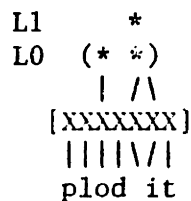


V->φ & V->V:

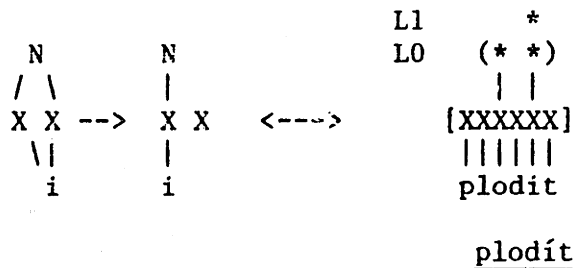


POST-CYCLIC

*->



Degem



In the same way, stress will be assigned to the final syllable in all forms of the present tense.

In the past tense, stress surfaces on the theme vowel suffix, even though it is not the final vowel in the word. In these forms, Post-Accentuation applies word-internally, from the root to the stem suffix. This is shown in (51).

(51) Post-Accentuation in the Past Tense of Thematic Verb Stems

plodíla 'she produced'

UR: [[[[plod] i] l] a]

	L1	*		L1	*
	L0	(*)* *		L0	(* *)*
<u>POST-CYCLIC</u>	[XXXXXXX] _P	-->	[XXXXXXX]		
	plodila		plodila		

4.7.3 APPENDIX: Nonderived Nouns and Adjectives Related to Thematic Verbs in -i and -e with Stress Pattern (iii)

<u>VERB</u>	<u>BASE NOUN</u>			<u>ACCENTUAL CLASS OF ROOT</u>
	<u>dat sg</u>	<u>nom pl</u>	<u>dat pl</u>	
golosít' 'to sing loudly'	gólos+u	golos+á	golos+ám (m) 'voice'	C
stročít' 'to stitch'	strok+é	strók+i	strok+ám (f) 'line'	C
tolpít' 'to crowd'	tolp+é	tólp+y	tolp+ám (f) 'crowd'	C
trubít' 'to blare'	trub+é	trúb+y	trub+ám (f) 'trumpet'	C

slezít'sja (intr.) 'to water (e.g. eyes)	slez+é	slěz+y	slez+ám (f) 'tear'	C
kustít'sja 'to put out side-shoots'	kust+ú	kust+á	kust+ám (m) 'bush'	B
plodít' 'to procreate'	plod+ú	plod+y	plod+ám (m) 'fruit'	B
doždít' 'to rain'	dožd'+ú	dožd'+í	dožd'+ám (m) 'rain'	B
xulít' 'to abuse'	xul+é	xul+y	xul+ám (f) 'abuse'	B
carít' 'to reign'	car'+ú	car'+í	car'+ám (m) 'czar'	B

<u>VERB</u>	<u>RELATED ADJECTIVE</u>			<u>ACCENTUAL CLASS</u>
	<u>F</u>	<u>N</u>	<u>PL</u>	<u>OF ROOT</u>
glupít' 'to make a fool of'	glup+á	glúp+o	glúp+y 'stupid'	C
živít' 'to animate'	živ+á	živ+o	živ+y 'alive'	C
zelenít' 'to plant in trees'	zelen+á	zelen+o	zelen+y 'green'	C
molodít' 'to make look younger'	molod+á	mólod+o	mólod+y 'young'	C
xripét' 'to wheeze'	xripl+á	xrípl+o	xrípl+y 'wheezy'	C

sipét'	sipl+á	sípl+o	sípl+y	C
'to speak hoarsely'			'hoarse'	
gor'ačít'	gor'ač+á	gor'ač+ó	gor'ač+y'	B
'to excite'			'hot'	
smešít'	smešn+á	smešn+ó	smešn+y'	B
'to make somebody laugh'			'funny'	
temnít'	temn+á	temn+ó	temn+y'	B
'to darken'			'dark'	
černít'	čern+á	čern+ó	čern+y'	B
'to paint black'			'black'	

4.7.4 Post-Accentuation and Retraction: Stress Pattern (iv)

Stress pattern (iv) is characterized by a stress shift within the present tense paradigm, with stress falling on the inflection (i.e. the final syllable) in the 1st sg and on the final vowel of the stem (i.e. the penultimate syllable) elsewhere. The past tense has stress on the stem-final vowel in all forms. The paradigm is repeated below.

(52) Stress Pattern (iv)

bormotát' 'to mutter'

	<u>PRESENT</u>	<u>PAST</u>
1ST SG	bormočú	F bormotála
3RD SG	bormóčet	PL bormotáli
3RD PL	bormóčut	

An important fact about this stress pattern is that it occurs with all three thematic suffixes.²³ This was not the case with the two previous stress patterns we examined.

I have argued that stress alternations occur in derived words when the root is unaccented and the leftmost accented suffixal vowel either deletes or becomes a glide, causing stress to alternate between the suffixal vowel and the preceding vowel of the stem. My analysis explains the complementary distribution of verb stems exhibiting stress patterns (ii) and (iii), by showing that, interactions between segmental processes, syllabification, and the BAP will produce different patterns of alternations, depending on the sequence of vowels which occur in a derived verb form. We are thus lead to conclude that verbs exhibiting stress pattern (iv) have accented roots, and that some additional, lexically-determined, feature causes the particular alternations characteristic of this pattern.

I have accounted for certain stress alternations in nouns, adjectives, and athematic verbs by positing a subclass of post-accenting morphemes which undergo Retraction in some, but not all, forms of an inflectional paradigm (i.e. Class B').²⁴ Recall that I have assumed that post-accenting morphemes are a type of accented morpheme, which means that they have have an accent associated with a particular vowel in their underlying representation.

Suppose we say that verbs with stress pattern (iv) have post-accenting roots, but that these roots are marked to undergo Retraction in all forms except the 1st sg. Since we have seen evidence of a

Retraction rule elsewhere, this does not involve introducing anything new into the analysis.²⁵

I will continue to assume that Post-Accentuation is a rule triggered by a feature associated with a morpheme. I formally represent this feature as a subscript on the righthand bracket of the morpheme. I have used *p* to identify a post-accenting morpheme and *r* to identify morphemes which trigger Retraction in certain forms.²⁶

Derivations of two present tense forms of a verb suffixed with a are given in (53)--one in which Retraction applies and one in which it does not. Note that if Post-Accentuation were to apply immediately after the BAP on the 3rd cycle, stress would end up on the root-final vowel in the 1st sg. The vowel bearing the transferred accent would subsequently become nonsyllabic (due to the *a->j* rule), causing the accent to move back to the root-final vowel. In fact, stress falls on the final vowel in this form.

Since segmental and syllabification processes are not relevant to stress assignment in these verbs, I have simplified the derivations by merely indicating what rules apply at each stage in the derivation, rather than giving the formal representation of each rule application.

(53) Derivations of Verb with Theme Suffix a and Stress Pattern (iv)

VERB: bormotát' 'to mutter'

*

ROOT: [bormot]_{p/r}

1ST SG: bormoč+ú

L1		*	*
L0	*	*	*
<u>CYCLE 2</u>	[[XXXXXX] _{p/r} X]		
	bormot		a

BAP

L1		*	
L0	(*	*)	*
	[[XXXXXX] _{p/r} X]		
	bormot		a

L1		*	*
L0	(*	*)*	*
<u>CYCLE 3</u>	[[XXXXXXXX] _{p/r} X]		
	bormota		u

BAP

L1		*	
L0	(*	*)*	*
	[[XXXXXXXX] _{p/r} X]		
	bormota		u

other rules:

a->j

Den Pal

3RD SG: bormóčet

L1		*	*
L0	*	*	*
<u>CYCLE 2</u>	[[XXXXXX] _{p/r} X]		
	bormot		a

BAP

L1		*	
L0	(*	*)	*
	[[XXXXXX] _{p/r} X]		
	bormot		a

L1		*	*
L0	(*	*)*	*
<u>CYCLE 3</u>	[[XXXXXXXX] _{p/r} XX]		
	bormota		et

BAP

L1		*	
L0	(*	*)*	*
	[[XXXXXXXX] _{p/r} XX]		
	bormota		et

other rules:

a->j

Den Pal

L1 *
L0 (* *) *
 | | /\
POST-CYCLIC [XXXXXXXX] _{p/r}
 ||||| \\
 bormočju

*->

L1 *
L0 (* * *)
 | | /\
 [XXXXXXXX]
 ||||| \\
 bormočju

Degem

 N N
 / \ --> |
X X X X
 \ | |
 \ u u

L1 *
L0 (* * *)
 | | |
 [XXXXXX X]
 ||||| |
 bormočju

bormočú

L1 *
L0 (* *) *
 | | /\
POST-CYCLIC [XXXXXXXXXX] _{p/r}
 ||||| \\\
 bormočjet

*->

L1 *
L0 (* * *)
 | | /\
 [XXXXXXXXXX]
 ||||| \\\
 bormočjet

<-*

L1 *
L0 (* *) *
 | | /\
 [XXXXXXXXXX]
 ||||| \\\
 bormocjet

Degem

 N N
 / \ --> |
X X X X
 \ | |
 e e

L1 *
L0 (* *) *
 | | |
 [XXXXXX XX]
 ||||| |
 bormočjet

bormóčet

4.8 Other Verbal Suffixes

4.8.1 Introduction

In this section I will briefly discuss other verbal suffixes, and show that my analysis accounts for the stress properties of verbs derived from these suffixes.

All suffixes, except for thematic suffixes i and e, belong to the 1st conjugation. This means that they take the present tense allomorph e and the 3rd pl agreement allomorph ut.

4.8.2 The Suffix aj

Verbs derived with the suffix aj have fixed stress. In some cases, stress is fixed on a root vowel, and in other cases it is fixed on the vowel of this suffix. Each pattern is illustrated below.

(54) Stress Patterns of Verbs Derived with the Suffix aj

(i) <u>dúmat</u> ' 'to do'		(ii) <u>lomát</u> ' 'to break'	
STEM: [dum+aj]		STEM: [lom+aj]	
1ST SG: dúmaju	F: dúmala	1ST SG: lomáju	F: lomála
3RD SG: dúmajet	PL: dúmali	3RD SG: lomájet	PL: lomáli
3RD PL: dúmajut		3RD PL: lomájut	

We can account for these patterns by simply assuming that the vowel a in the suffix aj is accented. Verbs with accented roots will

have stress fixed on the accented vowel of the root, while those with unaccented roots will have stress fixed on the accented vowel of the suffix.

In contrast to verbs derived from theme vowel suffixes, vowel sequences do not occur in these verbs. This is due to the presence of a glide in the underlying form of the suffix. My analysis correctly predicts that these verbs will not exhibit the stress alternations characteristic of verb stems ending in a vowel.

4.8.3 The suffix nu

Verbs derived with the suffix nu exhibit three different patterns of stress. The patterns are the same as (i), (iii), and (iv) of thematic verbs. The patterns are illustrated below.

(55) Stress Patterns of Verbs Derived with the Suffix nu

- (i) PATTERN: Fixed on the root
EXAMPLE: gíbnut 'to perish'
STEM: [gib+nu]

1ST SG: gíbnu F: gíbnula
3RD SG: gíbnet Pl: gíbnuli
3RD PL: gíbnut

- (ii) PATTERN: On the inflection (i.e. final syllable) in the present;
on the stem-final vowel (i.e. penult) in the past (like beredít)
EXAMPLE: stolknút 'to knock down'
STEM: [stolk+nu]

1ST SG: stolknú F: stolknúla
3RD SG: stolknët PL: stolknúli
3RD PL: stolknút

(iii) PATTERN: On the stem-final syllable (i.e. penult) in all forms except the 1st sg

EXAMPLE: obmanút 'to deceive'

STEM: [obman+nu]²⁷

1ST SG: obmanú F: obmanúla

3RD SG: obmánét PL: obmanúli

3RD PL: obmánut

Let us assume that this suffix is [+accented, -dominant]. Verbs with accented roots will have stress fixed on the root (pattern (i)).

What happens in verbs with unaccented roots is more complicated. In this case, stress is assigned in the same way as in thematic verbs whose stems end in a [-lo] vowel (e.g. molodít'). Vowel sequences occur in the present tense. In this case, the sequences are the following: u+u (1st sg); u+e (1st pl, 2nd sg & pl, 3rd sg), u+a (3rd pl). The vowel sequence will be incorporated into a nucleus. Since the stem-final vowel is [-lo], Vowel Deletion rather than Glide Formation will apply. The first vowel of the branching nucleus (u), which is the leftmost accented vowel in the word, will delete. Because it is the head of the nucleus, its skeletal position is preserved, as is its representation on the stress plane. Compensatory Lengthening (V->V:) applies. Thus the affected vowel acquires a new set of features from the following vowel. Degemination later applies, eliminating the second skeletal slot of the geminate vowel. Throughout the derivation, the accent remains associated with the first vowel in the sequence. It only appears to shift, because that vowel acquires the features of the vowel which follows it.

Pattern (iii) is exactly the pattern exhibited by verbs with post-accenting roots which undergo Retraction in all forms except the 1st sg. I could find only one verb derived from this suffix which exhibits this stress pattern. Since both Post-Accentuation and Retraction are rules triggered by features on a verb stem, we would expect there to be relatively few verbs with this pattern.

4.8.4 Verbs Derived with the Suffix ej

Verbs derived with the suffix ej have stress fixed on the suffix in all forms. This indicates that the suffix is [+accented, +dominant]. Affixation of the suffix triggers deletion of any accent on the stem.

An example is given below.

(56) Stress Pattern of Verbs Derived with the Suffix ej

PATTERN: fixed on the stem suffix

EXAMPLE: belét'

STEM: [bel+ej]

1ST SG: beléju F: beléla

3RD SG: beléjet PL: beléli

3RD PL: beléjut

4.9 Bracketing Paradoxes, Cyclicity, and Stress in Prefixed Nonderived Verbs

Prefixed athematic verbs with accented or post-accenting roots have the same stress pattern as nonprefixed forms. This is not necessarily true, however, of athematic verbs with unaccented roots. There are numerous prefixed verbs of this type for which there are two possible stress patterns: (i) stress shifts between the final syllable and the initial syllable of the root or (ii) stress shifts between the final syllable and the initial syllable of the prefixed stem. In other instances, the prefixed form has only pattern (i). The generalization is the following: if stress pattern (ii) is found with a given verb, then stress pattern (i) is as well, but not vice versa.²⁸

Consider first the data in (57). These are prefixed verbs whose stems consist of unaccented roots.

(57) Past Tense Stress in Prefixed Verbs with Unaccented Roots

(i) ROOT: [gniɟ]

	<u>F</u>	<u>PL</u>	<u>M</u>
<u>gnít'</u> 'to rot'	gni+lá	gní+li	gní+lø
<u>pod+gnít'</u> 'to begin to rot'	podgni+lá	podgní+li	podgní+lø
<u>pere+gnít'</u> 'to rot through'	peregni+lá	peregní+li	peregní+lø

(ii) ROOT: [plyw]

<u>plýt</u> ' 'to swim'	ply+lá	plý+li	plý+lφ
ot+ <u>plýt</u> ' 'to swim off'	otply+lá	otplý+li	otplý+lφ
<u>pere+plýt</u> ' 'to swim across'	pereply+lá	pereplý+li	pereplý+lφ

(iii) ROOT: [žiw]

<u>žit</u> ' 'to live'	ži+lá	ží+li	ží+lφ
<u>za+žit</u> ' 'to begin to live'	zaž+i+lá	zaž+i+li	zaž+i+lφ

The fact that these verbs all have stress alternating between the inflection and root raises an interesting problem. We have encountered no evidence thus far of noncyclic morphemes in Russian. In Chapter 1, I observed that mobile stress occurs only in nonderived forms or in derived forms which lack a syllabic derivational suffix. I showed that the assumption that all suffixes are cyclic is crucial to explaining this generalization. The BAP will apply on the second cycle. If the constituent comprising that cycle is unaccented, the default clause of the BAP will assign an accent to the initial vowel. Therefore, no word with a syllabic derivational suffix can enter the inflectional cycle without an accent.

Now consider the problem of prefixed stems. If the prefix is a cyclic morpheme, and if it is structurally internal to the inflection, then the BAP will first apply to the constituent [prefix [root]]. If the root is unaccented, an accent will be assigned to the initial vowel of

this prefixed stem. Since the leftmost accent gets stress, even if the inflectional suffix is accented, we predict that stress in these forms will be fixed on the initial syllable of the word (i.e. on the prefix). This is illustrated by the following derivation.

(58) Derivation Which Assumes that the Prefix is Structurally Internal to the Inflection and Triggers the BAP

zažilá 'she began to live'

UR: [[[za [žiw]] 1] a]

	L1		
	L0	*	*
<u>CYCLE 2</u>		[XX	[XXX]]
		za	žiw

BAP

	L1	*
	L0	(*) *
		[XX [XXX]]
		za žiw

```

      L1  *
      L0 (*)*
        | |
CYCLE 3 [[XXXXX] X]
        ||||| |
        zažiw l

```

BAP SCC

```

      L1  *      *
      L0 (*)*    *
        | |      |
CYCLE 4 [XXXXXX] X]
        ||||| |
        zažiwl a

```

BAP

```

      L1  *
      L0 (*)*    *
        | |      |
      [XXXXXX] X]
        ||||| |
      zažiwl a

```

*zážila

However, this is not the case. When stress does fall on the prefix, it is only in those forms in which the inflection is unaccented. When the inflection is accented, it always gets stress. Therefore, either the assumption that prefixes are cyclic is wrong or else the structure I posited for these forms is wrong.

Suppose we assume that prefixes are noncyclic morphemes. By this, we mean that they fail to trigger any cyclic rule, even when the conditions for that rule are met. There are different ways of representing this. One is to assume a level-ordered morphology, whereby affixes that trigger cyclic rules are attached before those which do

not. This will produce the correct result in the forms shown in (57). If the structure is [prefix [[root] inflection]], then the BAP will apply to the constituent [[root] inflection] before the prefix enters the derivation. Therefore, stress will fall on the inflection when it is accented, otherwise on the root.

We have no other evidence of noncyclic morphemes in Russian. However, the fact that dominant (i.e. accent-deleting) suffixes always precede recessive suffixes is consistent with the version of Lexical Phonology which assumes a level-ordered morphology. In order for the analysis to capture this, we need to assume that accent-deletion is a Level I rule, and assign only those affixes which trigger this rule to that level. In any other framework, the ordering of dominant and recessive suffixes is treated as accidental.

However, as pointed out in Chapter 1, analyses of the morphology and phonology of a number of languages, including for example English (cf Aronoff (1976)), Seri (cf. Cole (1987)), and Columbian Salish (cf Czaykowska-Higgins (1989)), has challenged the claim that all suffixes which trigger Level $n-1$ phonological rules are structurally internal to those which trigger Level n rules.

Halle and Vergnaud (1987) propose that the cyclic status of a morpheme is a lexically-determined property encoded by a feature on the morpheme. Bracketing then is determined by the semantics of the word. This analysis predicts that in athematic verbs the prefix attaches to

the bare root, but it fails to trigger cyclic rules **because** it is identified by a feature as [-cyclic].

This analysis will correctly derive stress in athematic verbs which have stress alternating between the inflection and the prefix. However, it will not account for the fact that all forms permit stress to alternate between the root and inflection (in many this is the only pattern permitted). Three examples of verbs exhibiting both patterns are given below.

(59) Dual Stress Patterns in Prefixed Athematic Verbs with Unaccented Roots

(i) prožit' 'to live through; survive'

(a) F: prožilá	(b) F: prožilá
M: prožil	M: próžil
PL: prožili	PL: próžili

(ii) otžit' 'to become obsolete'

(a) F: otžilá	(b) F: otžilá
M: otžil	M: ótžil
PL: otžili	PL: ótžili

(iii) podgnit' 'to begin to rot'

(a) F: podgnilá	(b) F: podgnilá
M: podgníl	M: pódgnil
PL: podgníli	PL: pódgnili

One solution, suggested to me by S.J. Keyser, is to assume that prefixes are noncyclic and structurally internal to the inflection. This will account for stress alternating between the prefix and inflection. For speakers who only get stress alternations between the root and inflection, we can stipulate that prefixes are not represented on the

stress plane. Derivations of both forms of prožiti' are given below. I use a subscript τ to mark the prefix as noncyclic.

(60) Derivations

(i) prožili 'they lived through'

	L1		
	L0		*
<u>CYCLE 2</u>	[[XXX] τ	[XXX]]	
	pro	žiw	

BAP

SCC

	L1		
	L0		*
<u>CYCLE 3</u>	[[XXX] τ	[XXX]]	X]
	pro	žiw	l

BAP

SCC

	L1			
	L0		*	*
<u>CYCLE 4</u>	[[XXX] τ	[XXXX]	X]]	
	pro	žiw	l	i

BAP

	L1			
	L0		(*)	*
	[[XXX] τ	[XXXX]	X]]	
	pro	žiw	l	i

prožili

(ii) próžili 'they lived through'

	L1		
	L0	*	*
<u>CYCLE 2</u>	{ [XXX] } _τ	{ [XXX] }	
	pro	ziw	

BAP	SCC
0.00	0.00
0.01	0.01
0.02	0.02
0.03	0.03
0.04	0.04
0.05	0.05
0.06	0.06
0.07	0.07
0.08	0.08
0.09	0.09
0.10	0.10
0.11	0.11
0.12	0.12
0.13	0.13
0.14	0.14
0.15	0.15
0.16	0.16
0.17	0.17
0.18	0.18
0.19	0.19
0.20	0.20
0.21	0.21
0.22	0.22
0.23	0.23
0.24	0.24
0.25	0.25
0.26	0.26
0.27	0.27
0.28	0.28
0.29	0.29
0.30	0.30
0.31	0.31
0.32	0.32
0.33	0.33
0.34	0.34
0.35	0.35
0.36	0.36
0.37	0.37
0.38	0.38
0.39	0.39
0.40	0.40
0.41	0.41
0.42	0.42
0.43	0.43
0.44	0.44
0.45	0.45
0.46	0.46
0.47	0.47
0.48	0.48
0.49	0.49
0.50	0.50
0.51	0.51
0.52	0.52
0.53	0.53
0.54	0.54
0.55	0.55
0.56	0.56
0.57	0.57
0.58	0.58
0.59	0.59
0.60	0.60
0.61	0.61
0.62	0.62
0.63	0.63
0.64	0.64
0.65	0.65
0.66	0.66
0.67	0.67
0.68	0.68
0.69	0.69
0.70	0.70
0.71	0.71
0.72	0.72
0.73	0.73
0.74	0.74
0.75	0.75
0.76	0.76
0.77	0.77
0.78	0.78
0.79	0.79
0.80	0.80
0.81	0.81
0.82	0.82
0.83	0.83
0.84	0.84
0.85	0.85
0.86	0.86
0.87	0.87
0.88	0.88
0.89	0.89
0.90	0.90
0.91	0.91
0.92	0.92
0.93	0.93
0.94	0.94
0.95	0.95
0.96	0.96
0.97	0.97
0.98	0.98
0.99	0.99
1.00	1.00

	L1		
	L0	*	*
<u>CYCLE 3</u>	[[[XXX] ,	[XXX]]	X]
	pro	žiw	l

BAP	SCC
0.00	0.00
0.01	0.01
0.02	0.02
0.03	0.03
0.04	0.04
0.05	0.05
0.06	0.06
0.07	0.07
0.08	0.08
0.09	0.09
0.10	0.10
0.11	0.11
0.12	0.12
0.13	0.13
0.14	0.14
0.15	0.15
0.16	0.16
0.17	0.17
0.18	0.18
0.19	0.19
0.20	0.20
0.21	0.21
0.22	0.22
0.23	0.23
0.24	0.24
0.25	0.25
0.26	0.26
0.27	0.27
0.28	0.28
0.29	0.29
0.30	0.30
0.31	0.31
0.32	0.32
0.33	0.33
0.34	0.34
0.35	0.35
0.36	0.36
0.37	0.37
0.38	0.38
0.39	0.39
0.40	0.40
0.41	0.41
0.42	0.42
0.43	0.43
0.44	0.44
0.45	0.45
0.46	0.46
0.47	0.47
0.48	0.48
0.49	0.49
0.50	0.50
0.51	0.51
0.52	0.52
0.53	0.53
0.54	0.54
0.55	0.55
0.56	0.56
0.57	0.57
0.58	0.58
0.59	0.59
0.60	0.60
0.61	0.61
0.62	0.62
0.63	0.63
0.64	0.64
0.65	0.65
0.66	0.66
0.67	0.67
0.68	0.68
0.69	0.69
0.70	0.70
0.71	0.71
0.72	0.72
0.73	0.73
0.74	0.74
0.75	0.75
0.76	0.76
0.77	0.77
0.78	0.78
0.79	0.79
0.80	0.80
0.81	0.81
0.82	0.82
0.83	0.83
0.84	0.84
0.85	0.85
0.86	0.86
0.87	0.87
0.88	0.88
0.89	0.89
0.90	0.90
0.91	0.91
0.92	0.92
0.93	0.93
0.94	0.94
0.95	0.95
0.96	0.96
0.97	0.97
0.98	0.98
0.99	0.99
1.00	1.00

	L1	*		
	L0	(*)	*	*
CYCLE 4	{[[[XXX] _τ	{XXX}]	X}	X}
	pro	žiw	l	i

próžili

4.10 Summary

In this chapter we have seen how the BAP interacts with segmental and syllabification processes to assign stress in derived verbs.

I have argued that there is a syllable structure constraint in Russian which requires that word internal syllables have **an** onset. A sequence of vowels is thus incorporated into the same syllable, forming a branching nucleus. I have stipulated that the initial position in a branching nucleus is head.

However, vowel sequences are eliminated in Russian. There are two ways in which this happens, depending on the feature specification of the initial vowel. If it is [+lo], Glide Formation applies. If it is [-lo], Deletion applies.

Vowel sequences occur in the underlying representation of many derived verb forms. If a vowel which is head of a Line 0 constituent undergoes Glide Formation, the accent shifts to the left. In this way I accounted for the stress properties of verbs with unaccented roots whose stems end in the vowel a. If the root is accented, stress is fixed on the accented root vowel.

If the initial vowel in the sequence is [-lo], Deletion occurs. This rule severs the association between the segmental plane and skeleton, but preserves the representation of the segment as a syllable nucleus. Deletion does not eliminate the representation of the affected vowel on the stress plane. Thus, if that vowel is head of a Line 0 constituent on the stress plane, it remains so. It acquires its segmental features from the following vowel, giving the illusion that

the accent has shifted rightward. In this way we account for stress in verbs with unaccented roots whose stems are suffixed with e or i.

I showed that the same stress pattern is produced in thematic verbs suffixed with e or i whose roots are post-accenting.

In derived verbs whose stems end in a consonant or glide, vowel truncation does not apply. Stress is assigned exactly as my analysis predicts. If the root is accented, it surfaces with stress, except when the stem suffix is accented and dominant (i.e. accent-deleting). Thus, these forms provide additional support for the system of stress presented in this study.

Notes: Chapter 4

1. Historically, all of the agreement suffixes ended in a vowel in both their underlying and surface forms. Based on the Old Church Slavonic forms (cf. Lunt (1959), p. 81)), we can postulate that the 1st pl, 2nd sg and pl, and 3rd sg forms were as follows: mΩ, ŷi, te, and tπ (where Ω and π represent the pair of high, lax vowels (yers) which were historically part of the phonemic inventory of the language. Of these, only the 2nd pl (te) has retained the vowel in Russian. There is no reason to assume that a vowel is present in the underlying representation of any of the agreement suffixes in the modern Russian.

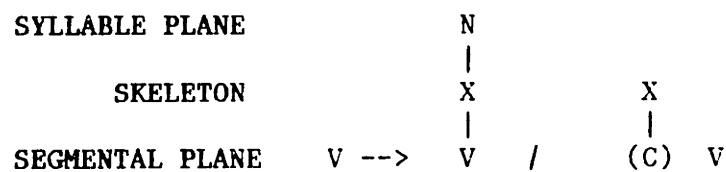
In Ukrainian, the 1st pl agreement suffix has retained the vowel, but the 3rd sg suffix has not. In the 1st pl, the high, back yer has lowered to o (1st pl: mo). A remnant of the vowel is found, however, in the 3rd sg, in the palatalization of the consonant (3rd sg: t').

2. I continue to use E and O to represent an underlying front or back vowel which alternates with zero in surface form, i.e. a yer.

3. In Chapter 2 I adopted a rule of Vocalization (VOC). This rule applies on the segmental plane. Given a sequence of two floating feature matrices, the first associates to the skeleton, and in turn projects a

nucleus on the syllable plane. This rule applies cyclically (and possibly post-cyclically as well). The rule is repeated below. (V = feature matrix which includes the specification [-cons]).

Vocalization Rule (VOC)



4. Recall that Post-Accentuation usually applies only when the accented vowel is penultimate. However, we did see cases in the adjectival system where Post-Accentuation occurred word-internally, namely from a root onto certain derivational suffixes (e.g. the suffixes ist and liv). The point is that if a derived word contains a post-accenting root, and the derivational suffix is syllabic, stress will either remain on the root itself or be transferred to the vowel belonging to the derivational suffix. It will not end up on the inflection.

5. If the stem-final consonant is labial (i.e. m, p, b, or v), l is inserted under the same conditions in which dental palatalization occurs. Thus, in verbs suffixed with i or e, l-insertion applies only in the 1st sg, while in verbs suffixed with a, l is inserted in all forms of the present tense. Examples are shown below.

<u>INFINITIVE</u>	<u>1ST SG</u>	<u>3RD SG</u>	<u>3RD PL</u>	
gubit'	gub'l'u	gubit	gub'at	'to destroy'
sipet'	sip'l'u	sipit	sip'at	'to croak'
dremat'	drem'l'u	dremlet	drem'l'at	'to doze'

6. There are approximately 275 of these, not including those with prefixed and compound stems.

7. There are only three thematic verbs with this stress pattern:

kolebát' 'to rock'; alkát' 'to crave for'; and kolyxát' 'to sway'.

However, I will show that my analysis of stress in these thematic verbs extends to a large class of derived verbs whose stems likewise end in a -- namely, those derived with the productive suffix ova.

8. There are approximately 260 verbs with this stress pattern

9. There are approximately 150 of these.

10. The fact that stress may be fixed on the root in thematic verbs shows that theme vowel suffixes are [-dominant].

11. This assumes, of course, that the BAP applies before Vowel Deletion.

12. Recall my arguments in Sect. 3 supporting the assumption that the present tense suffix e is not present in the underlying representation of the 1st sg and 3rd pl.

13. In the few instances where vowel sequences occur in the underlying representation of a morpheme, they are preserved. With one exception (paúk 'spider'), the examples involve foreign borrowings (e.g. xáoc 'chaos'; teátr 'theater'; seánc 'seance'). Vowel sequences which result from prefixation are likewise immune to truncation rules. Examples include: naobeščát (prefix: na) 'to promise a lot'; priískat (prefix: pri) 'to hunt for'.

14. For a different view of this distinction, cf Steriade (1988). In her analysis of syllabification processes and reduplication in Sanskrit, Steriade argues that primarily consonantal features such as [labial] and [coronal] should be used for non-syllabic sounds and vowel features [high] and [back] should be reserved for syllabic sounds. She posits a segmental, as well as syllable structure distinction, between high vowels and glides in Sanskrit (i.e. between i/j and u/w): (i) i = [-cons, +hi, -bk], j = [-cons, +coronal, -anterior]; (ii) u = [-cons, +hi, +bk], w = [-cons, +round].

15. This does not apply in word-final position, as shown by examples like the following: žárkij (m, nom sg) 'hot'; tboj (m, nom sg) 'your'; zimój 'in winter'; and kráj (m, nom sg) 'edge'.^v

16. Although the distinction between a glide and vowel purely is structural, in the interest of clarity I will use different graphemes to represent high vowels (i and u) and glides (j and w) in the representations below.

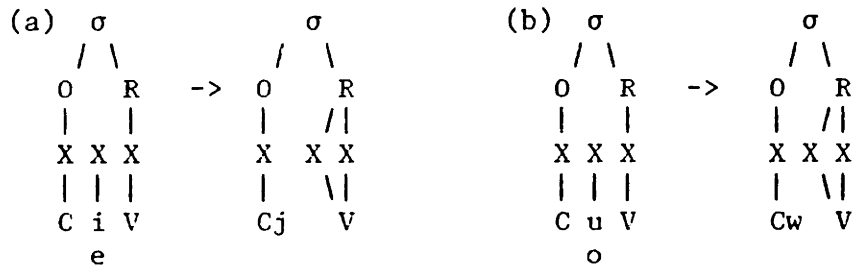
17. Verb stems ending in e or i take nt in the 3rd pl. Therefore, no vowel sequence occurs in this form.

18. Although they may differ in height ([±hi]), we might still appeal to the OCP (cf. Leben (1973), McCarthy (1979)) to explain this fact.

19. A similar patterning of [-lo] vowels is observed in Bantu languages. Sagey (1986, 225-230) argues that labiovelarization in Shona, and both labiovelarization and palatalization in Kinyarwanda, occur before unsyllabified [-lo] vowels. However, if the [-lo] vowel is followed by another with the same specification for [±bk], then labiovelarization and palatalization do not occur.

Sagey argues that the only branching rhymes in Kinyarwanda are long vowels. The first vowel in a sequence of unlike vowels will fail to syllabify, with compensatory lengthening of the following vowel. If [-

lo], the unsyllabified vowel will trigger palatalization or labiovelarization of the preceding consonant. This is illustrated below:



However, palatalization fails to occur when the two vowels are [-lo, əbk]. In the latter instance, vowel harmony somehow blocks palatalization. This is shown by examples like the following (from Sagey, 233)

/ku-gi-a/ [kugya] 'to go' /ku-gi-ir-a/ [kugiira] 'to go for'
 /ku-ke-a/ [gukya] 'to dawn' /ku-ke-ir-a/ [gukeera] 'to dawn for'

I am grateful to M. Kenstowicz for bringing these facts to my attention.

20. The related nonderived adjective has mobile stress: mololdá (f), mólody (pl) 'young'.

21. There are many exceptions to this rule. A basic generalization is that it applies only to original Slavic forms (e.g. words with the nominal suffix en and the 3rd pl of the present tense), not to more recent borrowings (e.g. studént; adresánt 'sender' (of mail); skeletón). Even among original Slavic forms, there are exceptions. For example, it does not apply in M short form adjectives (e.g. móloden 'young'; xóloden

'cold'). Nevertheless it does have the property of a rule, because it is sensitive to syllable structure. I will assume that suffixes are simply labeled as positive exceptions to this rule. For a detailed discussion of this alternation, cf. Lightner (1972), 181-202.

22. In many cases, there is no related nonderived word, and thus no means of independently verifying the accentual property of the root.

23. It also occurs in verbs derived with the suffix nu, as I will discuss later on.

24. This property is associated with a relatively small set of root morphemes, which suggests that it is highly marked.

25. One troubling fact, however, is that the stress pattern of athematic verbs which I have analyzed as having Class B' roots is different from that of thematic verbs with this class of root morpheme. In the former case, stress is on the inflection throughout the present tense and on the root throughout the past. In the latter case, there is a stress shift between the inflection and the stem-final vowel within the present tense paradigm, with stress on the stem-final vowel throughout the past. The contrast is illustrated below:

ATHEMATIC VERB

krást' 'to steal'

Root: [krad]

Class: B'

<u>PRESENT</u>		<u>PAST</u>	
1 SG	krad+ú	F	krá+la
3 SG	krad+ět	PL	krá+li
3 PL	krad+út		

THEMATIC VERB

bormotát' 'to murmur'

Root: [bormot]

Class: B'

<u>PRESENT</u>		<u>PAST</u>	
1 SG	bormoč+ú	F	bormotá+la
3 SG	bormoč+et	PL	bormotá+li
3 PL	bormoč+ut		

Since I can find no explanation for this difference, I will simply stipulate that Retraction applies differently in nonderived and derived verb forms.

There is one exception, however. I mentioned earlier that there is one nonderived (athematic) verb which exhibits the stress pattern under discussion. The verb is moč' 'to be able': mogú (1st sg), móžet (3rd sg), mógut (3rd pl); moglá (f) moglí (pl).

26. The only examples I have found are root morphemes.

27. This is the only example I could find of a verb with a stem ending in nu which has this stress pattern.

28. There is one exception: verbs with the prefix vy, whether derived or nonderived, have stress on this prefix. Examples include: vývesti 'to lead out', from vestí 'to lead'; vývarit 'to boil to nothing', from

varít' 'to boil'; výletet' 'to fly out', from letét' 'to fly; and
výpisat' 'to copy out', from pisát' 'to write'.

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