

3 Lexical Accents and Prosodic Form

3.1. Introduction

Pervasive presence of marking and competition of lexical accents for stress are the characteristics that primarily identify a lexical accent system. This chapter focuses on the prosodic aspects of lexical accent systems and especially those that relate to lexical marking. The case studies are Greek and Russian. The competition between lexical accents in these languages is examined in Chapter 4.

The central proposal of this chapter is that a language that does not have predictable stress has predictable prosodic shape. Lexically accented words in Greek and Russian display variable accentual patterns but invariable prosodic structure. Lexical accents are not randomly dispersed along the string of vocalic peaks. On the contrary, they chose positions that guarantee that the prosodic form of the output word will be binary. In other words, accented words are not smaller than a foot or longer than two feet.

Another important issue addressed in this chapter is the relation between marking and default accentuation. In lexical accent systems, next to marked words there is a handful of unmarked ones with regular (fixed) stress. Although these two subsystems come apart in many respects, I show that they are not radically different from each other. Both lexical marking and the default submit to certain phonological principles that determine the overall accentual behavior of Greek and Russian words. The following section briefly sketches the main ideas advanced in this chapter.

3.1.1. Theoretical explorations in Chapter 3

The data from Greek and Russian show that marking has a dynamic presence in the accentual systems of these languages. The vast majority of the vocabulary is

targeted by lexical accents and not the default. This empirical observation makes one wonder why marking is so wide-spread if it is nothing more than an uncontrolled device that derives unpredictable and arbitrary patterns of stress. This claim, however, is not quite correct. In the present chapter I argue that languages that have pervasive marking develop mechanisms to control it. More specifically, I propose that marking in lexical accent systems is restricted by prosodic-form constraints.

Prosodic faithfulness constraints urge an inherent accent to be realized in the output. Structural constraints, on the other hand, enforce other, more rhythmic patterns. The effects of marking become evident only by having structural constraints on foot-form (FOOTFORM),¹ which enforce rhythmic accentual patterns, outranked by faithfulness constraints, which encourage the realization of underlying prosodic structure in the output. This means that marking arises when FAITH >> FOOTFORM (cf. the ranking in Chapter 1).

The central claim here is that lexically assigned metrical information in Greek and Russian is not free. Prosodic faithfulness is restricted by constraints that determine the prosodic shape of the word. To be more explicit, there is a split in prosodic faithfulness. Faithfulness to the lexical accent is always high ranked to guarantee that lexical information will not be superseded by rhythmic constraints. Prosodic faithfulness constraints that refer to the exact position of a lexical accent, however, are dominated by word-form constraints: WORDFORM >> FAITH TO POSITION OF LA >> FOOTFORM. Thus, prosodic faithfulness has both a dominated and a dominating position in the network of constraints which together regulate lexical marking. Consequently, the ranking is shaped as follows:

- (1) *ranking for restricted accentual contrasts*
 FAITH TO LA, WORDFORM >> FAITH TO POSITION OF LA >>
 FOOTFORM

This type of marking, with restricted lexical contrasts, is called *templatic* in this study because the principles which condition prosody lead to the formation of templates (McCarthy and Prince 1993a, 1995, Kager 1994a). Templates are considered to be prosodically ideal forms because they are maximally binary (i.e. [σ +F], [F+ σ], [F+F]). Marks that are controlled by WORDFORM constraints,

¹ Under this label are grouped constraints such as FOOTBINARITY, PARSE- σ (Prince and Smolensky 1993), and some other constraints. I use this term here to emphasize the contrast between constraints that determine the prosodic shape of the word and constraints that control the construction of lower prosodic constituents such as feet. These constraints form together the DEFAULT that assigns prosodic structure in the absence of lexical accents.

namely templatic marks, occur in positions which ensure that a given morphological structure will be binary.

To conclude, lexical accents limit their arbitrariness by restricting themselves to prosodically predictable positions. Such a restricted theory of lexical prosody has a number of important theoretical implications. First, the possible, though not exact, position of inherent marks can be predicted. There are few positions in a word that can lead to well-formed prosodic structure and hence be targeted by templatic marks. Second, lexically determined stress is now derived from input-output constraints and not from stipulating restrictions on underlying representations.

Next to templatic marking there is also *diacritic marking*, which is insensitive to the phonological conditions that control the construction of ideal prosodic words. Diacritic marking characterizes the accentual behavior of loan forms which exhibit a variable degree of assimilation to the phonological, prosodic and morphological principles of the native language. This is the type of marking that characterizes, for instance, exceptional stress in Polish (*rezím* 'regime', *univérsitet* 'university') and Spanish nouns (*pájaro* 'bird', *sofá* 'sofa'). I show that the distinction between templatic and diacritic marking is not an artifact of the analysis but reflects the *core/periphery* organization of lexicons in natural languages (among others, Itô and Mester 1995a,b). According to this theory, elements in the core of the lexicon fulfill all constraints of the Grammar. However, moving towards less central areas there are loan words which respect only a subset of these constraints. Exceptional stress patterns stand at the periphery of the Greek and Russian grammar. Such patterns are regularized when the loan form is assimilated more and more to the principles that govern the accentuation of native words. When the core grammar is reached, diacritic accents succumb to prosodic wellformedness constraints and reform to templatic.

The two types of marking have the same phonological representation but differ in function. Technically, the functional difference between templatic and diacritic marking is encoded as different constraint rankings.

The discussion of the various types of marking highlights significant aspects of the default accentuation as well. It points out that marking and the default are not unrelated and distant to each other systems. On the contrary, they converge to a great extent since they both yield to general phonological restrictions that govern the languages examined here. In Greek for example, the three-syllable-window limitation holds for accented as well as accentless words.

The discussion of the accentual facts of Greek and Russian reveals an important generalization: root-faithfulness seems to be more important than suffix-faithfulness. The suggested domination order is given a principled

interpretation in Chapter 4 where it is shown that in fact it expresses a more fundamental property of lexical accent systems, namely head dominance (HEADFAITH >> FAITH).

This chapter sheds light on other issues such as the rhythmic aspects of lexical accent systems and their interaction with prosodic faithfulness, the nature of unaccentability and foot-tailness, the predictable position of accent in disyllabic inflectional suffixes in Russian, and so on.

Before closing up this introductory part I should make clear that the analysis of this chapter solely focuses on the accentual behavior of inflected nouns with one lexical accent or no accents at all. There is not enough space to provide an exhaustive presentation of the stress facts in other syntactic categories than the noun. Therefore, apart from a short description no further mention of adjectival and verbal stress will be made.

The ideas promoted in this chapter are roughly organized as follows: The first part of this chapter deals with Greek. In §3.2, I give some background information on Greek. Previous analyses of Greek stress are briefly reviewed in §3.3. In §3.4, I introduce the empirical facts that concern us in this chapter and in §3.5 I argue that marking is templatic. Default stress is the subject of §3.6. In §3.7, I claim that there are also some loan words with diacritic marking. A short summary of stress in adjectives and verbs is presented in §3.8. The main points of Greek stress are summarized in §3.9.

The second part concentrates on Russian. A short introduction to the phonological and morphological characteristics of the language is provided in §3.10. §3.11 gives a flavor of the empirical facts that are examined in the second part of this chapter and §3.12 continues with the analysis. Default stress is examined in §3.13. Exceptional stress in Russian is the subject of §3.14. A summary of stress in adjectives and verbs is given in §3.15. The main points of Russian accentuation in words with one lexical accent or no accent at all are presented in §3.16. In §3.17, I summarize the central ideas of this chapter and offer an overview of Greek and Russian stress by pointing out the differences and similarities between the two systems. In the Appendix, one can find information on rhythmically conditioned vowel reduction and exhaustive parsing in Russian.

Greek

The idea explored in the first part of this chapter is that accented words in Greek have ideal prosodic form but unpredictable stress pattern as opposed to accentless words which have fixed antepenultimate stress but variable prosodic

shape. Before proceeding, it is wise to give a step-by-step presentation of how this idea develops in the following sections.

After the introduction of the main phonological and morphological characteristics of Greek (§3.2. and §3.3), I provide a list with lexically accented and accentless words. The study of the patterns displayed by the listed forms leads to the conclusion that some prosodic shapes are missing and some others are less preferred (§3.4).

Starting from the unattested patterns, which mainly concern accented words, it is argued that lexical accents are under the spell of wellformedness constraints that define the prosodic form of a word. Some patterns are excluded by a constraint that limits stressable positions to the last three syllables of the word and some others are excluded by a constraint that limits lexical accents to positions that guarantee strict binarity between prosodic constituents of the word (§3.5.1). In other words, the former constraint rejects patterns like (óσ)(σσ) which have stress further than the antepenultimate syllable and the latter constraint rejects patterns like σ(óσ)σ which form a non-binary prosodic word. Restricted lexical contrasts in marked words are expressed with a ranking in which prosodic faithfulness to the lexical accent dominates prosodic form constraints which, in turn, dominate faithfulness to the position of a lexical accent. The examination of marked patterns originating from roots (§3.5.2) and inflectional suffixes (§3.5.3) reveals another split in faithfulness. There is strong evidence that inherent accentual properties of roots are given priority over accentual properties of suffixes. The segregation between root-faithfulness and suffix-faithfulness is given a principled interpretation in Chapter 4.

Less favored patterns, which are mainly associated with unmarked words, are accounted for in §3.6. Words stressed by default have predictable stress but variable prosodic shape. Moreover, they are hampered by accentual mobility within the paradigm caused by the fact that unmarked roots are combined with accented suffixes in some grammatical cases and unmarked suffixes in other grammatical cases. The examination of Greek stress is completed with a brief examination of stress in loan words (§3.7) and the remaining syntactic categories (§3.8).

3.2. Background Information on Greek

Accent in Greek is phonetically manifested as stress. The acoustic correlates of word stress are duration, amplitude and pitch. Stressed syllables have longer duration and higher amplitude than unstressed ones and are associated with F0 rises (Arvaniti 1991). Greek syllable structure lacks distinctions of phonological

weight; all syllables are of equal phonological weight (Joseph and Philippaki 1987).

Greek is a bounded system; the scope of primary stress is limited to the last three syllables of the word. Feet in Greek are trochaic. As I show in the following sections, antepenultimate stress is analyzed with a syllabic trochee and extrametricality of the final syllable. More importantly, stress shifts triggered by semivocalization show a rightward movement, e.g. *trapezíu* > *trapezjú* ‘table-GEN.sg’. According to Halle and Vergnaud (1987), rightward stress movement emerging from the loss of the stressed vowel indicates a left-headed (trochaic) grouping of syllabic constituents.

Malikouti-Drachman and Drachman (1989) and Drachman and Malikouti-Drachman (1996) have argued that Greek lacks word minimum, therefore monosyllabic feet under primary stress are permitted (Hayes 1995, Kager 1995). There are some monosyllabic verbal forms, e.g. *ǎés* ‘see-2sg.IMP’, *pés* ‘say-2sg.IMP’, *zó* ‘live-1sg.PRES’ and a few archaic nouns, e.g. *fós* ‘light’, *kó* ‘Kos (name of island)-ACC.sg’.

Greek is a language with fusional morphology. Words usually consist of several morphemes such as, for instance, a root and an inflectional ending.² Nominal roots are followed by a suffix that designates number and case, e.g. *ánθrop-os* ‘man’, and verbal roots are followed by an aspectual morpheme and a personal suffix, e.g. *αγαπ-ús-a-me* ‘love-PAST CONT-1pl’. As in all fusional languages, a single suffix can represent number and case simultaneously. For example, the ending /-o/ in *ánθropo* indicates accusative case and singular number and the ending /-on/ in *ánθrópon* indicates genitive case and plural number.

It must be made clear right from the beginning that in this thesis I treat the vowel /-o-/ in forms like *ánθropos* as part of the inflectional suffix and not as part of the root (as it used to be in Ancient Greek). There are a number of reasons that suggest this segmentation.

First, if we consider the vowel /-o-/ to be part of the root, *ánθropo-s*, we have to implement a truncation rule to account for the fact that in most cases of the paradigm, as well as in derivation, this vowel is lost:

- | | | | |
|-----|---------------|-----------------|--------------|
| (2) | a. anθrópu | /anθropo-u/ | ‘man-GEN.sg’ |
| | b. anθropinós | /anθropo-in-os/ | ‘human’ |

² Greek does not assign inflection to unassimilated loan words. There is also a class of neuter nouns ending in /-ma/ which have zero inflection in some grammatical cases, e.g. *kíma* (NOM.sg) but *kímat-os* (GEN.sg) ‘wave’ (Ralli 1994).

- c. *anθropákos* /anθropo-ak-os/ ‘little man’
 d. *anθropévo* /anθropo-ev-o/ ‘humanize’

As obvious from the above examples, the thematic vowel /-o-/ is always truncated. One would expect the thematic vowel to surface at least in some cases, namely before consonant initial suffixes. However, it is puzzling that the majority of suffixes are vowel initial. If roots had thematic vowels, it would have been natural to expect at least some consonant initial suffixes. The fact that all Greek suffixes are vowel initial indicates that the thematic vowel has been morphologically reanalyzed and introduced as part of the suffix.³

Second, in compound words of the type [[root + synthetic vowel + root] suffix], roots are consonant final, therefore, the synthetic vowel /-o-/ intervenes to connect them. Note that the synthetic vowel /-o-/ can also occur with feminine roots of the *-a* class, e.g. *petr-o-kéras-o* ‘type of cherry’ from *pétr-a* ‘stone’ (class *-a* feminine noun) and *kerás-i* ‘cherry’ (class *-i* neuter noun). The point becomes clearer when the aforementioned example is compared to the compound *makrimális* ‘long-haired’. Here there is no need for a synthetic vowel because the root has the thematic vowel /-i-/, *makri-s* (NOM.sg.masc), *makri-a* (NOM.sg.fem) *makri-i* (NOM.pl.masc) ‘long’.

The theoretical assumptions just presented receive additional support from current views on the morphological structure of Greek words, expressed in the work of Ralli (1986, 1988, 1993) and Anastasiadi (1993). It should be mentioned though, that a different morphological segmentation that accepts the independent notion of thematic vowel does not contradict the accentual analysis proposed in the following sections. It only implies a different representation for unaccentable (post-stressing) morphemes according to which the morpheme at issue is just accented on the thematic vowel. However, for the reasons just presented, I assert that the vowel /-o-/ is part of the inflectional suffix and not the root.

Before delving deeper into the analysis of the Greek facts I give an overview of previous analyses of Greek stress in §3.3. The analysis of Greek advanced in this study is set out in §3.4.

³ One may wonder why the thematic vowel is taken as a unit with the inflectional suffix. There is little, if any, gain from the segmentation /anθrop-o-s/ since each thematic vowel must choose a particular set of inflectional endings. For example, /-o-/ chooses the endings {-s, -u, -∅, -i, -n, -us} whereas /-a-/ chooses the endings {-∅, -s, -∅, -es, -on}.

3.3. Previous Analyses of Greek Stress

The literature on Greek accentuation offers a variety of proposals regarding the assignment of word stress. The core idea in these analyses is that primary stress cannot be straightforwardly accounted for on purely phonological grounds. Morphologically equivalent words such as *ánthropos* ‘man’, *fantáros* ‘soldier’ and *uranós* ‘sky’, for instance, exhibit phonologically unmotivated differences in stress. The complexity of the system is further enhanced by accentual alternations that take place within the paradigm as in *ánthropos* (NOM.sg), *anθrópu* (GEN.sg). The analyses available in the literature motivate the different accentual behavior of such examples by means of rules that are related either to specific grammatical categories (Philippaki–Warburton 1976), or morphological principles (Ralli 1988, Ralli and Touradzidis 1992) or different grammars (Malikouti–Drachman and Drachman 1989, Drachman and Malikouti–Drachman 1996). The specifics of the aforementioned analyses are presented in this section. It is better to mention in advance, that the main purpose of this brief reference to other approaches to Greek stress is mainly to highlight the diverse nature of Greek stress and not to compare viewpoints or theoretical frameworks.

3.3.1. Philippaki–Warburton (1976)

Philippaki–Warburton (1976) emphasizes the mixed nature of Greek accentuation in her analysis. Stress in verbs is conditioned by rules that refer to specific morphological categories or classes, whereas stress in nouns is primarily marked in the lexicon. Starting from verbs, different stress rules apply to different verbal forms. For instance, a rule is responsible for the antepenultimate stress in past tense forms (*órisa* ‘define-PAST.1sg’), and another rule assigns penultimate stress in present tense forms (*orízo* ‘define-PRES.1sg’) and imperatives (*orísu* ‘define-MIDDLE.PAST.2sg.IMP’). On the other hand, the best way to analyze stress in nouns and adjectives is to assume that the respective morphemes are inherently marked. Lexical accents mark one of the last three positions of the word because Greek is a three-syllable-window language. For example, stress is on the antepenult in *ánthropos*, the penult in *fantáros* and the ultimate in *uranós*. In addition to marking, two rules that trigger stress shifts are employed in nominal accentuation.

The first stress shift rule is phonological: it applies when the addition of a suffix violates the three-syllable-window as in *timúmatos* (GEN.sg) from *tímima* (NOM.sg) ‘price’. The second stress shift rule is morphologized: it moves stress one syllable to the right in specific morphological environments. For example the rule applies in the genitive singular of masculine nouns in *-os* deriving

anθrópu from the nominative singular *ánθropos*. This accentual allomorphy results from the loss of vowel length in Post-Classical Greek, the original conditioning factor in the ancient language.

The value of this proposal centers on the recognition of the diverse nature of Greek stress, and specifically, the dichotomy in the accentual behaviour of nouns and verbs. However, the proposed model lacks uniformity. The fact that rules and marking are independently employed for the analysis of distinct grammatical categories of one and the same language is problematic. It is equivalent to saying that two different grammars coexist in the language and there is nothing in the theory that explains this specific combination of grammars or precludes the presence of other possible grammars. Another less inviting aspect of the analysis is that the morphologized rule of stress shift applies to a non-natural group of morphological environments ranging from the genitive and accusative case of masculine nouns in *-os* (for example, *anθrópu* (GEN.sg) vs. *ánθropos* (NOM.sg) ‘man’) to the nominative and accusative plural cases of nouns in *-is* (for example, *prítanis* (NOM.pl) vs. *prítanis* (NOM.sg) ‘dean’) and some imperative forms (for example, *ἀγάπ-α* ‘love-2sg.IMP’). Moreover, the analysis abstracts away from a large number of cases where the morphologized rule fails to apply as in *klívanos* (NOM.sg), *klívanu* (GEN.sg) ‘kiln’.

3.3.2. Ralli (1988), Ralli and Touradzidis (1992)

Pursuing the idea that stress in Greek is driven by morphology, Ralli (1988) and Touradzidis (1992) propose that all morphemes are listed in the lexicon as being inherently accented, unmarked or triggers of stress shifts. Primary stress is assigned by means of the *Righthand Head Rule* (Williams 1981) and *Percolation Principle* (Selkirk 1982). More specifically, when morphemes come together in word formation, stress is determined by the accentual properties of the rightmost head node, and, more precisely, by the metrical information specified in the inflectional or derivational suffix depending on the construction. For instance, in *anθropáki* /ánθrop-áki/ ‘little man’ both the root and the suffix have an inherent accent, but only the accent of the rightmost constituent surfaces as primary. If the suffix-head lacks an accent, then the accent of a non-head node is given the chance to percolate up to the word and become primary. For example, in *ánθropos* the suffix */-os/* is unspecified for stress but the root is lexically listed with initial stress, /ánθrop-/. Since the head is unmarked, the inherent specification of the root percolates up to the word. When the head node is marked to trigger an accentual shift, percolation guarantees that the property

of the head defines word stress. In *anθrópu* penultimate stress is triggered by the genitive singular suffix /-u/ which is stress shifting.

Many positive properties distinguish this approach. First, it proposes a unified analysis for stress by means of lexical marking. Second, it acknowledges the crucial role morphology has for stress. Stress is mainly resolved by morphological structure, it is the head of the word that decides for the position of stress. This idea has been adopted and further exploited in the present study (cf. Chapter 4). There are, however, some technical issues that refer to the accentual properties of morphemes. For example, it is unclear how we can account for the stress difference in pairs like *ánθropos-anθrópu* and *klívanos-klívanu*, or how a stress-shifting suffix is represented, and other similar questions.

3.3.3. Malikouti-Drachman and Drachman (1989), Drachman and Malikouti-Drachman (1996)

Malikouti-Drachman and Drachman (1989) give a metrical analysis of Greek stress. They argue that the default algorithm stresses the antepenultimate syllable and analyze this pattern with a syllabic trochee and extrametricality of the final syllable at the right edge of the word, e.g. *kro(kóǥi)<los>* ‘crocodile’. They account for the ‘deviant’ (pen)ultimate stress by means of morphological levels. Inherently accented words, resulting either from marking (*fantáros*) or stress shifts (*anθrópu*) are grouped in the first level of the grammar. Words stressed by the default rule occupy the second, more productive level.

In a recent article Malikouti-Drachman and Drachman (1996) propose a different account for Greek stress. They employ feet, extrametricality, alignment and marking to derive Greek stress.

Mobility of stress is a fundamental characteristic of Greek stress. The position of stress is relatively free. Stress occurs on one of the last three syllables of the word and often alternates from one syllable to the other within the paradigm. The first case of stress-shift is ‘transparent’; it is nothing more than an automatic stress adjustment imposed by the trisyllabic limitation of the language as in *timímatos* (GEN.sg) from *tímima* (NOM.sg) ‘price’. The second type of stress-shift is ‘opaque’; it takes place in specific morphological environments as in *ánθropos* (NOM.sg), *anθrópu* (GEN.sg). All three permissible positions of stress are exploited, as shown in (3).

- (3)
- | | | | | |
|----|-----------------|-----------------|---------------------|--------------|
| a. | άνθρωπος (APU) | fantáros (PU) | uranós (U) | nouns in -os |
| | ‘man’ | ‘soldier’ | ‘sky’ | |
| b. | θάλασα | stafíða | αγορά | nouns in -a |
| | ‘sea’ | ‘raisin’ | ‘market’ | |
| c. | όμορφος | μεγάλος | αγαθός | adjectives |
| | ‘beautiful’ | ‘big’ | ‘naive’ | |
| d. | τίλικσα | τιλίγο | τιλιχθό | verbs |
| | ‘wrap-PAST.1sg’ | ‘wrap-PRES.1sg’ | ‘wrap-MDL-SUBJ.1sg’ | |

Abstracting away from details that are beyond the scope of the present discussion, the analysis develops as follows: all inflectional endings are extrametrical leaving the root as the main domain of stress assignment. A binary trochaic foot is aligned at the right edge of the root in words that surface with antepenultimate stress and a unary (monosyllabic) foot is aligned at the right edge in words with penultimate stress. Final stress arises when the root is post-stressing. In this case the root is marked to assign an accent to the following inflectional ending which then loses its extrametrical status. The application of the proposal is shown in (4).

- (4)
- | | | | |
|----|-----------|-----------|-----------|
| | (* .) < > | (*) < > | (*) |
| a. | anθrop-os | fantar-os | uran-os |
| b. | omorf-os | meγal-os | αγαθ-os |
| c. | tiliks-a | tiliy-o | tilix-θ-o |

However, there are more instances in which the ban of extrametricality is raised. A handful of inflectional endings, mostly in nouns and verbs, are inherently specified as non-extrametrical. As a result ‘opaque’ alternations emerge in the paradigmatic level, as illustrated in (5).

- (5)
- | | | | |
|----|--------|------------------------------|-------|
| a. | NOM.sg | άνθρωπ-os _[+extr] | ‘man’ |
| b. | GEN.sg | anθρόπ-u _[-extr] | |
| c. | NOM.pl | άνθρωπ-i _[+extr] | |
| d. | GEN.pl | anθρόπ-on _[-extr] | |
| e. | ACC.pl | anθρόπ-us _[-extr] | |

A second instantiation of ‘opaque’ stress-shifts is witnessed when the ending is marked to bear stress, as shown in (6). Extrametricality is canceled by the inherent stress property of the suffix.

- (6) a. NOM.sg θάλας-α_[+extr] ‘sea’
 b. GEN.pl θάλας-όν_[+stress]

To summarize, in this model the basic unit for stress is the root. A trochaic foot is aligned to the right edge of the root. Whether the foot is binary or unary is an idiosyncratic selection of a specific root. Endings are most commonly extrametrical. Extrametricality of the final constituent is canceled either when the root is post-stressing or when the suffix is specified as non-extrametrical or is stressed itself.

The account offered by Malikouti–Drachman and Drachman is significant from many points of view. First, it gives a uniform interpretation of Greek stress, emphasizing at the same time its morphological character, and especially the sensitivity of the system to morphological units such as roots and suffixes. Second, ‘opaque’ alternations are treated not as fossilised rules of the past but as active feature of the system that, despite its idiosyncratic flavor, is prosodic in nature. However, the model implies a complicated theory of marking since different tools are used to mark idiosyncratic metrical information to roots and suffixes. Roots are lexically listed with a binary or unary foot, whereas suffixes are listed as being stressed or exceptions to extrametricality. Moreover, the same stress pattern is derived by more than one marking mechanism. Antepenultimate stress results from a binary foot at the right edge of the root as in the noun *άνθρωπος* ‘man’ but it can also be derived from a unary foot as in the verb *τίλιγ-υμε* ‘wrap-PRES.1pl’, depending on whether the following suffix is monosyllabic or disyllabic.

The analysis does not offer a clear-cut idea as to which pattern of marking represents the default case for Greek stress. It seems that the binary foot with final syllable extrametricality represents default stress. However, as argued by Drachman and Malikouti–Drachman, this is the default case for a specific class of nouns, namely nouns in *-os*, and most verbal forms. Other noun classes (i.e. feminine in *-a* such as *θάλαςα*) and adjectives statistically show a preference for penultimate stress, suggesting that penultimate must be considered the default pattern for these cases.

Such a dichotomy introduces extra complications in marking; the unary foot on the root is exceptional for masculine nouns in *-os* class but not for feminine nouns of the *-a* class. Finally, it is not clear whether in paradigms like *φαντάρ-ος* (NOM.sg), *φαντάρ-υ* (GEN.sg), *φαντάρ-ο* (ACC.sg), which are derived by a monosyllabic foot at the end of the root, the final syllable is included in the foot or is extrametrical. If the first scenario holds, that is *fan(táros)*, then the ending is not extrametrical any more and is included in the prosodic structure. This,

however, implies that the word is exceptional in two respects: it has a unary foot and revokes the extrametricality of the final suffix. If the foot is indeed monosyllabic the representation *fan(tár)os* is not well-formed according to current metrical theories (Hayes 1981, 1995, among many others). Foot monosyllabicity in quantity insensitive languages is never combined with final syllable extrametricality.

The analyses just described despite their differences converge to the following point: the mixed nature of Greek stress. This idea is further explored in the present chapter. Moreover, some more light is shed on cryptic and obscure aspects of Greek stress like the unexplained absence of certain accentual patterns, an observation that is telling for the dynamics and the overall constitution of the language. It must be mentioned that all previous studies have been invaluable sources of consultation and the proposal that unfolds in the following pages is in many respects inspired by them. The present analysis is couched in the light of a new theoretical model, namely the Optimality Theory, that provides more efficient tools for the description and analysis of the accentual phenomena in Greek. However, often the ideas trace back to the pioneering work of the aforementioned scholars. In the next section I proceed with the basic facts and the analysis of accented and accentless nouns.

3.4. Accentual Patterns in Nouns

3.4.1. The facts

This section presents the corpus of data that will be accounted for. An exhaustive presentation of Greek stress is beyond the goals of this thesis. I restrict the discussion to the accentuation of unmarked words and words with one lexical accent. I draw the examples from the two most productive classes of Greek nouns: the *-os* class of masculine (and feminine nouns) in (7) and the *-a* class of feminine nouns in (8). A small sample of non-native words follows in (9). The fact that we only focus on this data does not imply, however, that the analysis of accentual facts is incomplete. The classes examined here give a thorough picture of the variety of accentual phenomena attested in Greek. A short summary of stress in other syntactic categories is presented in §3.8.

- (7) *masculine nouns in -os* (NOM.sg), *-u* (GEN.sg)
- | | | | |
|----|----------|-------------|-----------|
| a. | ánθropos | a'. anθrópu | 'man' |
| b. | klívanos | b'. klívanu | 'kiln' |
| c. | fantáros | c'. fantáru | 'soldier' |

d. servitóros	d'	servitóru	‘waiter’
e. uranós	e'	uranú	‘sky’
f. xorós	f'	xorú	‘dance’

(8) *femine nouns in -a* (NOM.sg), *-on* (GEN.pl)

a. θάλασα	a'	thalasón	‘sea’
b. γόνδολα	b'	gónðolon	‘gondola’
c. stafíða	c'	stafíðon	‘raisin’
d. θιγάτερα	d'	thigáteron	‘daughter’
e. αγορά	e'	agorón	‘market’
f. φορά	f'	forón	‘turn’

Starting from nouns in *-os* listed in (7), stress occurs in all three permissible positions. The examples *ánthropos*, *klívanos*, *fantáros*, *uranós* are morphologically equivalent; they consist of a disyllabic root and a monosyllabic suffix. However, accentually they diverge. First, they are accented in different syllabic positions and second, stress in (7a) shifts from the antepenultimate syllable in the nominative to the penultimate one in the genitive. In the remaining examples in (7) stress is immobile. A similar situation is witnessed in (8a), with the difference that here stress shifts from the antepenultimate to the ultimate syllable. In general, the examples (7a) and (7b) and, similarly, (8a) and (8b) share the same accentual pattern in the nominative case but not in the genitive. Notice that in both pairs stress is on the antepenultimate syllable. This is a crucial detail for the interpretation of the facts.

One way to explain the stress patterns in (7-8) is to argue that the inflectional suffix of the nominative singular */-os/* has three accentual allomorphs: it is unmarked in (7a) and (7b), pre-accenting in (7c) and (7d) and accented in (7e) and (7f). In the same spirit, the genitive suffix is pre-accenting in nouns of the *ánthropos*-type but unmarked in nouns of the *klívanos*-type. The problem with this solution is that it implies a very complicated system of marking since each morpheme has to be specified in the lexicon for the accentual type of suffix it should be combined with. Given that the Greek paradigm is quite long and that there are at least ten different classes of nouns, we realize that probably this is not the best way to account for the accentual diversity.

A more economical option is to assume that roots are equipped with inherent accentual properties. To be more precise, one can claim that there are three accentual classes of roots: first, roots like */ánthrop-/* that lack metrical prespecification; second, roots like */klívan-/* and */fantár-/* that bear a lexical

accent on some syllable and, finally, roots like like /uran-'/ and /xor-'/ that push stress out of their domain.

This solution allows us at the same time to account for accentual alternations. An unmarked root is stressed by default when it combines with an equally unmarked suffix but it loses stress after an accented suffix. For instance, if we take /anθrop-/ and /θalas-/ to be unmarked roots, then we can attribute antepenultimate stress to the default and the accentual alternations in the genitive to the pre-accenting suffix /-u/ and the accented suffix /-on/, respectively. Consequently, the difference between *ánθropos* and *klívanos* and, similarly, *θálasa* and *ýnðola* hinges on the fact that the former root in each pair is unmarked and therefore stressed by default, whereas the latter root is accented on the initial syllable.

One naturally assumes that often the distinction between default and marking is neutralized in some grammatical cases. Notice, however, that examples like *ánθropos* and *θálasa* lack the paradigmatic uniformity that marked words have. Unmarked roots are subject to accentual alternations every time they are combined with accented and accentless suffixes. This issue is further elucidated in Chapter 4.

Finally, a few loan words are listed in (9). Notice that loan words are uninflected and, moreover, some of them (9i-j) are stressed on the pre-antepenultimate syllable triggering violation of the trisyllabic window.

- (9) *loan words*
- | | | | |
|------------|--------------|---------------|--------------|
| a. gól | 'goal' | f. memorándum | 'memorandum' |
| b. fául | 'foul' | g. montgómeri | 'coat' |
| c. mamúθ | 'mammoth' | h. kalorifér | 'radiator' |
| d. pulóver | 'pullover' | i. kámeraman | 'cameraman' |
| e. selofán | 'cellophane' | j. kópirait | 'copyright' |

3.4.2. Marked and unmarked patterns

Based on the data in the previous section, we assert that morphemes in Greek exhibit a wide variety of accentual patterns. They can lack inherent accentual properties (10a) or they can be marked with a strong (head) or a weak (tail) lexical accent (10b).

(10) *accentual properties of morphemes*a. *unmarked*

anθrop-	θalas-
-os	-a

b. *marked*

<u>accented/pre-accenting</u>		<u>unaccentable</u>
(klivan-	fan(tar-	<u>uran-</u>
(γonðol-	sta(fið-	<u>aγor-</u>
-u)	-(on	

In Chapter 2, I presented the basic principles of the theory of marking promoted in this study. According to this theory there are two accentual classes of morphemes, the unmarked and the marked one. Members of the former category lack inherent metrical specification. Words composed of unmarked morphemes are stressed by the ‘default’ algorithm. This is a fixed subsystem that operates in the language in order to assign a prosodic make-up to words that are accent-free. As mentioned earlier, default stress in Greek is on the antepenultimate syllable of the word. The specifics of the default accentuation are examined in §3.6. In the marked group, three subclasses are further recognized: accented, pre-accenting and unaccentable morphemes.

Marked morphemes, on the other hand, are prespecified with an autosegmental feature called lexical accent. Lexical accents can be strong or weak. In foot-based languages, the former type of accent is tantamount to a (foot-)head and the latter is tantamount to a (foot-)tail. According to the theory of marking developed in this thesis, an accented root such as /fantar-/ is equipped with a strong accent on its final vocalic peak. This accent is parsed as the head of the foot and is typographically indicated as: /fan(tar-/. Richness of the Base advocates that a lexical accent can be located on any possible position within the root. It depends on the overall constraint ranking of the language to derive the correct output by taking any imaginable representation as input. For example, the stress of *fantáros* can originate from an infinite pool of inputs. Representations such as (*fantar-*, *fan(tar-*, even *fantar-* are all possible input forms. Lexicon Optimization, introduced by Prince and Smolensky (1993) and further developed by Itô, Mester and Padgett (1995), will choose the representation that incurs the least constraint violations of high ranked constraints as the harmonic input. In our example, the form *fan(tar-* will be selected as the harmonic input for the form *fantáros*. Subsequently, each morpheme has one underlying representation, the one which better complies with the most important constraints.

Weakly-accented morphemes are represented with a right foot-bracket, e.g. *anθróp-u*). This bracket is a notational convention that denotes nothing more than a weak lexical accent. Weak accents in Greek avoid prominence by occupying the tail part of a foot. Weakly-accented suffixes do not impose a foot-head on the preceding morpheme. As I show in §3.5.3.2, the fact that suffixes marked for foot-tailness surface as pre-accenting is determined by the structural constraints of the language.

Prosodic faithfulness constraints have been introduced in Chapter 2. A constraint such as MAX(HEAD/TAIL) is violated by any foot-head/tail in the input that lacks a matching head in the output. To illustrate with an example, this constraint is violated when the foot-head in /fan(tar-/ is not present in the output form. Similarly, a DEP(HEAD/TAIL) constraint demands an output foot-head/tail to match input head/tail. This implies that an output with a lexical accent which has no correspondent accent in the input constitutes a violation of this constraint. In the discussion that follows, I refer collectively to MAX(HEAD/TAIL) and DEP(HEAD/TAIL) constraints as ‘FAITH(HEAD/ TAIL)’ when there is no reason to distinguish between them.

The anti-migration constraint *FLOP requires input-output faithfulness to the association between a lexical accent and its vocalic peak. The importance of *FLOP for accentuation is shown shortly when high ranked word-form constraints push the lexical accent away from its underlying position. *FLOP is irrelevant for the evaluation of candidate forms with floating accents since these accents are not linked to any specific vowel in the input. The migration of a floating accent to a neighboring morpheme is initiated by the structural constraint *DOMAIN.

3.4.3. Common patterns and gaps

The table in (11) summarizes all empirically documented patterns of roots and inflectional suffixes in Greek. Loan words exhibit richer accentual contrasts as opposed to native words which display a more restricted set of prosodic patterns. Recall that Greek does not assign inflection to words of foreign origin. Consequently, in loans roots are equivalent to words. There is another discrepancy between the native and the foreign vocabulary. Native underived words are usually no more than four-syllables long,⁴ whereas loan words can exceed this length, e.g. *vulkanizatér* ‘vulcanizer’.

⁴ Some assimilated loans are polysyllabic, e.g. *provokátoras* ‘agent provocateur’, *akuaréla* ‘water-color’, *tamperaménto* ‘temperament’. The criteria for the distinction between assimilated and non-assimilated loan words are given in §3.7.

(11)

accentual pattern	1σ ROOTS	2σ ROOTS	3σ ROOTS	4σ ROOTS	SUFFIX
unmarked	xor-	θalas-	astragal-		-os
marked accented	(kut-	sta(fið- (yonðol-	servi(tor- *σ(σσ- *(σσσ-	kalori(fer memo(randum mont(gomeri (kameraman	-(on
unaccentable	<u>for-</u>	<u>aγor-</u>	* <u>σσσ-</u>		
pre-accenting					-u) ⁵

The table in (11) invites some very interesting observations. Starting from the native words, four-syllable words are never accented on the antepenultimate syllable. This means that there are no marked trisyllabic roots with prefinal accent, **ser(vítor-os*, **θi(γáter-a*. Moreover, no marked (native) words with pre-antepenultimate stress surface, rightfully so, because of the three-syllable-window. Interestingly, there are no trisyllabic unaccentable roots. Finally, preaccentuation is strictly restricted to suffixes. There is no evidence for pre-accenting roots. As mentioned before, the only way to test this hypothesis is by examining prefixed constructions. However, Greek is an instance of the prefix/suffix asymmetry; prefixes usually fall outside the domain of the prosodic word (Van Oostendorp 1997). Moreover, it is difficult for prefixes to host stress without violating the window. The gaps in (11) are accounted for in the following section.

Unassimilated loan words are special in many respects. The lack of inflectional paradigm together with the fact that they hardly participate in any morphological process makes it impossible to test the existence of unaccentable and unmarked patterns in such constituents. For example, it is hard to argue whether antepenultimate stress in examples like *montgómeri* ‘coat’ is due to the default clause or to marking. Interestingly, the loan vocabulary is the only part of the Standard Greek vocabulary that disrespects the trisyllabic stress limitation, e.g. (*káme*)(*raman*) ‘cameraman’.⁶ The accentuation of loan words is examined separately in §3.7.

It is impressive that 86% of the nominal vocabulary in my corpus (16.000 nouns in *-os* and *-a*) consists of marked words (67.5% accented roots, 18.5% unaccentable roots) and only 10.2% consists of unmarked ones.⁷ The statistical

⁵ In §3.5.3.2, I explain why pre-accenting suffixes are not unaccentable.

⁶ This word is not perceived as a compound by Greek speakers.

⁷ The corpus is based on the *Reverse Dictionary of Modern Greek* [Antistrofon Lexikon tis

discrepancy between the marked and unmarked patterns is another important issue that must be accounted for. This question is undertaken in §3.6.1. What is important at this point is to explain the absence of certain accentual patterns from the native vocabulary and see how the native (marked and unmarked) words are stressed.

3.5. Accentuation of Nouns with One Lexical Accent

3.5.1. Marked feet in the pool

To explain the gaps displayed by marked (native) words, let us first take a better look at the patterns of prosody attested in these words. These patterns are listed in (12). For the sake of uniformity, I choose the accent of the marked examples to originate from the root.

(12) *marked words in Greek*

1σ WORDS	2σ WORDS	3σ WORDS
a. (kúta)	c. sta(fíð̂a)	f. (servi)(tóros)
b. fo(rá)	d. (γόν̂ðo)la	g. *(σ̂σ)(σσ)
	e. (aγo)(rá)	h. *σ(σσ)(σ̂)
		i. *σ(σ̂σ)σ
		j. *(σσ)σ(σ̂)

Some preliminary remarks are necessary for understanding the prosodic forms in (12). First of all, parsing in Greek is exhaustive but degenerate feet are allowed only under primary stress as indicated by (12b). Malikouti–Drachman and Drachman (1981) argue that in normal speech, words containing two or more syllables to the left of the lexical stress show optional secondary (rhythmic) stress, e.g. (p̂ire)(ás) ‘Pireaus’, (tr̂ape)(záki) ‘small table’. Arvaniti (1991) objects to the audibility of rhythmic stress in Greek but she agrees that rhythmically stressed syllables are more prominent than unstressed ones because they often have higher amplitude integral. In addition, rhythmic stress provides the background for variation under casual-speech reduction as shown by the following examples from Malikouti–Drachman and Drachman (1981:284):

Neas Ellinikis] compiled by Kourmoulis (1967).

- (13) *variation as the result of vowel reduction*
 a. (èfxa)ri(stó) > èfxr₁stó
 b. ef(xàri)(stó) > fxàr₁stó ‘to thank’

The second criterion that supports the exhaustivity of parsing in Greek is the reduction/deletion of high vowels in unparsed and weakly parsed syllables. In casual speech, high vowels that are in a foot-head position (other than the stressed one of course) display a smaller degree of reduction than high vowels that are unparsed or in foot-dependent position. For example, the /u/ in (aku)(stíkan) ‘they were heard’ reduces more than the /u/ in a(k_usti)(ká) ‘earpiece (pl)’ because the latter is the head of a (secondary) foot.

The phenomenon of vowel reduction/elision is more forcefully manifested in the Northern Greek dialects. The examples in (14) picture the interaction between stress and reduction. Standard Greek forms are given between slashes. All the examples come from the dialect of Siatista which has been meticulously analyzed in Margariti-Roga (1985).⁸

- (14) *vowel reduction/elision in the Siatista dialect*
- | | <u>present</u> | | <u>past</u> | | |
|----|----------------|----------|-------------|------------|-------------------|
| a. | fu(résu) | /foréso/ | (fóri)sa | /fóresa/ | ‘to put on’ |
| b. | đu(rísu) | /đoríso/ | (đórsa) | /đórisa/ | ‘to donate’ |
| c. | a(kúsu) | /akúso/ | (áksa) | /ákusa/ | ‘to hear’ |
| d. | sa(pún’) | /sapúni/ | sap(n’ízu) | /sapunizo/ | ‘soap’, ‘to soap’ |

With these preliminaries out of the way, let us concentrate on the main theme of the section, namely the unattested patterns in (12). The lack of four-syllable marked words with initial stress, (σσ)(σσ), can be easily accounted for; the ENDRULE-R (ER-R), stated in (15), together with FOOTTYPE: TROCHEE are high ranking in Greek. The former constraint assigns prominence to the rightmost foot of the word,⁹ the latter is responsible for the trochaic patterning of stress in the language.

⁸ The empirical facts from Northern Greek are very important because they also provide evidence against the Iambic/Trochaic Law (Hayes 1995). More specifically, they show that unstressed vowel shortening is not only a characteristic of iambic languages. Trochaic systems can also reduce or even delete vowels in order to enhance the perception of the stressed syllable (Revithiadou and Van de Vijver 1997).

⁹ In fact, as we will see later in this study, this constraint is responsible for the three-syllable-window in Greek.

- (15) a. ENDRULE-R (Prince 1983, cf. EDGEMOST in Prince and Smolensky 1993)
 The rightmost foot of the word is the head of the prosodic word.
- b. FOOTTYPE:TROCHEE
 Feet are left-headed: ($\sigma\sigma$), (σ)

However, there are still two unattested forms left: the system lacks four-syllable words accented on the antepenultimate or final syllable. Certainly, neither structure can be ruled out by ER-R, since both are legitimately right-headed. If the distribution of lexical accents is arbitrary and uncontrolled, why are certain positions deprived of lexical marks?

Descriptively, unattested forms lack binarity. They are either composed of a foot flanked by two syllables, σ +F+ σ , or two feet and a syllable adjoined to their left, σ +F+F, or two feet and a syllable in between, F+ σ +F. In contrast, the formations which are prevalent in the language have a strictly binary branching at the level of prosodic word. These forms have a *templatic* shape. But what exactly are *templates*?

Templates are prosodic shape requirements imposed on certain morphological formations (Itô and Mester 1992, McCarthy and Prince 1993a, 1995, Kager 1994a, Van de Vijver 1998). They are combinations of authentic units of prosody such as a syllable and a foot [σ +F], [F+ σ] (Loose Minimal Word, LMW); or two feet [F+F] (Prosodic Compound, PrCpd). Any authentic unit of prosody defines a Strict Minimal Word (SMW), [F]. Templates have a strictly binary branching; they consist minimally of a foot and maximally of two feet. To put it simply, they are well-formed prosodic words.

The set of templates which together characterize a category forms a *template pool*. We can now naturally claim that the prevailing patterns of marking in Greek are drawn from a PrCpd pool. Disyllabic marked words form either a Strict Minimal Word [(σ - σ)] or a right-headed Loose Minimal Word [σ -(σ)]. Trisyllabic words exhibit a wider range of accentual possibilities: they are either parsed into a right-headed LMW [σ (σ - σ)], a left-headed LMW [($\sigma\sigma$)- σ] or a right-headed PrCpd [($\sigma\sigma$)(- σ)]. Interestingly, the only parsing possibility for marked four-syllable words is a right-headed PrCpd [($\sigma\sigma$)(σ - σ)]. This is because of boundedness. As evident from the patterns in (12b) and (12e), templates with final monosyllabic head are permitted as a marking choice. Greek lacks a word minimum (Drachman and Malikouti-Drachman 1996), and this might support a catalectic account of monosyllabicity. Another solution would be to assert that the system wants to exploit the three positions available

for stress as much as possible, and therefore deems foot binarity less important. To conclude, I call marks which occur in prosodically unmarked positions *templatic marks*.

An important generalization emerges at this point: marked words have unpredictable stress but predictable prosodic shape, whereas unmarked words have predictable antepenultimate stress but invariable prosodic shape. For example, four-syllable long words have predictable binary branching, if accented, (*servi*)(*tóros*), or predictable antepenultimate stress, if accentless, *a(stráγa)los*.

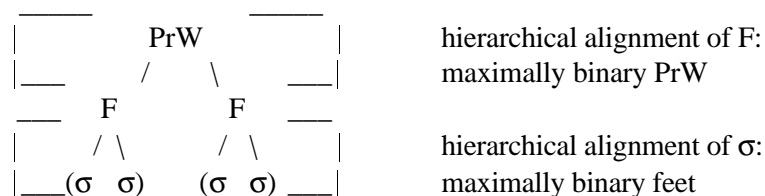
A crucial task of the analysis will be to define the nature of constraints that control prosodic wellformedness, i.e. templatic marking. Itô and Mester (1992, 1995c) and Itô, Kitagawa and Mester (henceforth IKM) (1992, 1996) derive binarity as an upper and lower limit from more elementary principles like *hierarchical alignment*:¹⁰

(16) *hierarchical alignment*

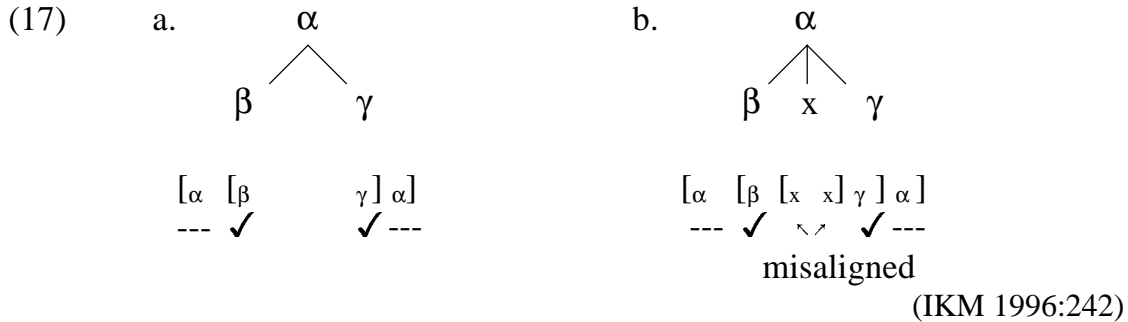
Every prosodic constituent is aligned with some prosodic constituent that contains it.

Hierarchical alignment is defined for constituents that stand in a containment relationship. The intuitive idea is that in prosodic structures with maximally binary branching, every constituent lies at the right or left edge of some larger constituent. In fact, the constraint is composed of small statements of the type: a syllable must be left/right aligned with the prosodic constituent that contains it, a foot must be left/right aligned with the prosodic constituent that contains it, and so on. Notice that hierarchical alignment is violated even when binarity is not satisfied at one of all prosodic levels. A prosodic word that contains two feet one of which is ternary, incurs a violation of the constraint in (16). Similarly, a prosodic word that is composed by a syllable and two feet is deemed equally ungrammatical by hierarchical alignment. The structures in (17) illustrate the

¹⁰ Itô and Mester (1995c) choose hierarchical alignment instead of PRWBINARITY (Itô and Mester 1992) because this way binary branching is derived as a limit from more elementary considerations. The basic effects of hierarchical alignment at the foot-level and at the word-level are illustrated in the following diagram:



point. In (17a), β is left-aligned with α , and γ is right-aligned with α . In the ternary structure (17b), x is neither left- or right-aligned with α . If β , γ and x stand for a syllable and α for a foot, then the foot is binary in (17a), but ternary in (17b).



For lexically marked words, hierarchical alignment refers to containment relationships between prosodic constituents starting from the lexical accent and moving upwards. More specifically, the constraint is composed of short statements of the following type: a lexical accent must be left/right aligned with the prosodic constituent that contains it, a syllable must be left/right aligned with the prosodic constituent that contains it, and so on. The constraint is violated when one or more of these shorter statements is violated. Notice that the revised definition of hierarchical alignment has a stricter reading; it only evaluates words that contain a lexical accent. It does not apply to words that lack a lexical accent. In (18) I give the revised version of hierarchical alignment:

- (18) HIERARCHICAL ALIGNMENT (HIERAL) (*revised*)
 A lexical accent is left/right aligned with the prosodic constituent that contains it, a syllable is left/right aligned with the prosodic constituent that contains it, a foot is left/right aligned with the prosodic constituent that contains it.

Weakly layered ternary structures like the ones constructed by the unattested forms, namely σ +F+F (12h), σ +F+ σ (12i), and F+ σ +F (12j) fare badly in terms of hierarchical alignment. In the first two forms there is an unaligned foot in the middle of the structure, and in the third one an unaligned syllable. The patterns derived by hierarchical alignment in Greek marked words are summarized in (19).

(19) *patterns derived by hierarchical alignment*

a. (óσ)	c. σ(óσ)	f. (σσ)(óσ)
b. σ(ó)	d. (óσ)σ	g. (óσ)(σσ) ¹¹
	e. (σσ)(ó)	

To summarize, in this section I have shown that marked words in Greek have an ideal prosodic structure: they form templates. As I show in the following section, in theoretic terms the emergence of ideal prosodic structures is expressed by means of a ranking that gives priority to hierarchical alignment over a constraint that urges accents to remain fixed to their lexical association. The major implication of the proposed model is that lexical contrasts are restricted. Section §3.5.2 presents the analysis of the patterns in (19) starting from words whose accent originates from a root and moving on to words whose accent originates from an inflectional suffix (§3.5.3).

3.5.2. Nouns with a marked root

3.5.2.1. Accented roots

One of the main proposals in this chapter is that marking in lexical accent systems is restricted by word-form constraints, i.e. constraints that control the prosodic shape of words. The examination of the patterns with lexical accents in Greek has clearly demonstrated that certain syllabic positions cannot host lexical accents because the resulting structure will not be strictly binary. Specifically, there is only one possible parsing for four-syllable words: a right-headed PrCpd.

I propose that semi-predictable stress or, rather, templatic marking emerges from a ranking in which hierarchical alignment (HIERAL) outranks faithfulness to the position of a lexical accent. Recall that FAITH, as defined in Chapter 2, defines the relation between correspondent lexical accents. MAX(HEAD) prohibits the deletion of a foot-head but does not impose any requirement with respect to the migration of the foot-head from one specific syllable of the input to another in the output. To explain, MAX(HEAD) is not violated when the foot-head moves from the initial syllable of the input root (*servitor-* to the final root syllable in the output, *servi(tor-*. Faithfulness to the position of a lexical accent is enforced by *FLOP. This constraint bans the migration of a lexical accent beyond its input sponsoring vowel.

¹¹ As I have already mentioned, this pattern is ruled out by the three-syllable-window.

At this point, the most crucial ranking is between HIERAL, the structural constraint that demands prosodic wellformedness, and *FLOP, the faithfulness constraint that bans migration of the lexical accent. The proposed ranking is given in (20). Keep in mind that ENDRULE-R and TROCHEE are undominated in the system.

- (20) *proposed ranking for templatic marking (first version)*
 FAITH(HEAD/TAIL), HIERAL >> *FLOP

Let us take a word like *servitóros* ‘waiter’ which has an inherent accent on some syllable of the root. In the output form, the lexical accent lands on the penultimate syllable but this does not preclude that the accent cannot originate from another syllabic position. According to Richness of the Base (Prince and Smolensky 1993), it does not technically matter what kind of underlying representation is given to morphemes. Thus, the lexical mark of our example can be located either on the first (21a) or second (21b) or last syllable of the root (21c), or it can even be a floating accent (21d):

- (21) *inventory of possible inputs for the root ‘servitor-’*
 a. (servitor c. servi(tor-
 b. ser(vitor- d. servitor-

In order to show that any representation from the pool of inputs can lead to a correct output, I choose the representation in (21b), *ser(vitor-*, to be a *possible input* for the derivation. The suffix is unmarked, therefore it does not invoke any faithfulness constraint. I also assume that PARSE- σ (Prince and Smolensky 1993)¹² is responsible for parsing a string of syllables into feet. This constraint is ranked, of course, below faithfulness in lexical accent systems. (Complete justification for this ranking is given in the derivation of the word *anθrópu* ‘man-GEN.sg’ §3.5.3.2). The ranking between FAITH and HIERAL is unclear at this point. As the tableau in (22) illustrates, the results of the ranking in (20), are straightforward.

¹² Parse- σ : A syllable is parsed into a foot.

(22)

<i>possible input:</i> ser(vitor-, -os)	ER-R	FAITH (HEAD)	HIERAL	*FLOP	PARSE-σ
☞ a. (servi)(tóros)				*	
b. (sérvī)(toros)	*!			*	
c. ser(vító)ros			*!		**
d. ser(vito)(rós)			*!	*	*

Candidate (22a) wins due to HIERAL and ER-R. Any role that *FLOP plays in eliminating competitors is not crucial. What is truly important is that the surface form should satisfy HIERAL. Structural constraints such as ER-R are also valued highly in the system. The form in (22b) is doomed to fail because, besides *FLOP, it fatally violates ER-R. The candidate, (22c), is also excluded from the competition because it sacrifices HIERAL in favor of faithfulness to the input position of the foot-head. Moreover, it leaves two syllables unparsed but this is a minor violation given the ranking of the constraint. Being faithful to the input does not play any role for its survival. Finally, (22d) is also ungrammatical because it crucially violates HIERAL.

The tableau in (22) suggests that the lexical accent eagerly migrates for the sake of the prosodic wellformedness of the word. The question now is how eager is a lexical accent to migrate when prosodic wellformedness requirements are satisfied. Answering this question is equivalent to establishing the ranking between the anti-migration constraint *FLOP and the structural constraint *DOMAIN, which promotes global realization of a lexical accent. For this purpose let us examine the accentuation of words like *stafíĉa* ‘raisin’.

As mentioned earlier, this word is composed of an accented root, /sta(fiĉ-/), and an unmarked suffix, /-a/. By Lexicon Optimization (Prince and Smolensky 1993, Itô, Mester and Padgett 1995) the pattern /sta(fiĉ-/), with a strong accent on the root-final syllable, is chosen as the most harmonic input. The fact that the accent in the output form remains anchored to the root that sponsors it makes evident that *FLOP dominates *DOMAIN: *FLOP >> *DOMAIN.

(23)

<i>input:</i> sta(fiĉ-, -a)	*FLOP	*DOMAIN
☞ a. sta(fíĉa)		*
b. (stafi)(ĉá)	*!	

The examples discussed so far suggest that there is a split in prosodic faithfulness constraints. Prosodic faithfulness has both a dominating and a dominated position in the system of constraints. More specifically, faithfulness to lexical accent is high ranked but prosodic faithfulness to association lines is dominated by a prosodic wellformedness constraint. This ranking leads to the formation of marked words that have a templatic shape.

Such a theory of marking generates restricted lexical contrasts with important theoretical implications. First, marking is semi-predictable. There are few positions in a word that can lead to well-formed prosodic words and hence be targeted by templatic marks. Thus, the possible, though not exact, position of inherent accents can be predicted. Second, lexically determined stress is now derived from input-output constraints and not from stipulating restrictions on underlying representations.

The effects of word-form constraints in forming outputs are further examined in the following section.

3.5.2.2. Unaccentable roots

In this section, I come back to the issue of unaccentability and examine possible scenarios in order to account for the accentual behavior of these morphemes. Recall that unaccentability is manifested in words like *uranós* whose final stress does not originate from the inflection as in *xor-ón* ‘land-GEN.pl’ and *thalas-ón* ‘sea-GEN.pl’. In §3.4.1, I argued that final stress in *uranós* is triggered by a marking property of the root. However, having established that an accent cannot exceed the territory of the morpheme it belongs to, the origin of lexical accent in *uranós* is still problematic. The answer must be found in some other property that unaccentable morphemes have.

A first hypothesis would be to claim that roots like /uran-/ are extrametrical. Under this assumption, the stress pattern of *uranós* emerges because the last syllable is the first element after the extrametrical domain created by the root and, consequently, the only available host for stress. Interestingly, this hypothesis implies that final stress in *uranós* is an instantiation of the default accentuation. The difference with other cases of default stress such as *astrágalos* lies on the extrametrical domain created by the root. An immediate consequence of this analysis is that words with extrametrical roots will not be subject to prosodic wellformedness constraints like hierarchical alignment. This predicts the existence of four-syllable words with final stress which are, however, unattested: **servitorós*. We conclude, therefore, that the proposed analysis cannot be correct.

There is a second hypothesis that can more successfully account for these facts. One can argue that the root is indeed equipped with a lexical accent but this accent is not fixed to any vocalic peak, it is floating. This proposal has two positive aspects. First, it attributes the lexical accent to the root, as desired, and second, it accounts for the non-local distribution of the lexical accent. A floating accent is not subject to the non-migration constraint *FLOP because it lacks association lines. With *FLOP out of play the structural constraint that enforces lexical accents to extend beyond the scope of their sponsors, namely *DOMAIN, is given a chance to take accentuation into its hands and determine the optimal output. Thus, the final accent of *uranós* results from the difference between a linked and unlinked accent and not from a marking mechanism or a rule that shifts stress from the root to the suffix.

An abstract example will help us understand how this constraint evaluates outputs. Take the form in (24) to be an unaccentable root like /uran-/. According to what has been argued so far, only the form in (24a) satisfies both FAITH and *DOMAIN. It preserves the lexical accent of the root and, more importantly, extends the scope of lexical accent from the morpheme to the whole word. The form (24b), on the other hand, is ungrammatical because the lexical accent is realized locally triggering a violation of *DOMAIN.

(24)	<i>input form</i>		<i>output form</i>		
	*		*		*
		>	\		
	σσ- -σ		a. σσ-σ		*b. σσ-σ

The picture is radically different when the input accent is associated to the sponsoring morpheme as in (25). Any realization of the accent beyond the root results in violation of *FLOP. This is illustrated by the form (25b) where the lexical accent of the root migrates to the suffix. Faithfulness here is violated when the lexical accent is not realized on the surface at all.

(25)	<i>input form</i>		<i>output form</i>		
	*		*		*
					\
	σσ- -σ	>	a. σσ-σ		*b. σσ-σ

An important observation must be pointed out. The optimal form (24a) suggests another split in FAITH. In order to both preserve the accent of the root and comply to *DOMAIN, a lexical accent is added to an unmarked inflectional suffix (in violation of DEP(HEAD)). In short, faithfulness to the suffix is deemed

less important than faithfulness to the root. This is a crucial fact that comes up later in the accentuation of words with a marked suffix and, more importantly, in the accentuation of words with conflicting lexical accents. At the moment, I suggest to separate FAITH into two constraints: faithfulness to the lexical accent of the root, FAITH_R and faithfulness to the lexical accent of the inflectional suffix, FAITH_{InfS}. I should make clear that this is a temporary distinction necessitated by the purposes of the discussion that takes place in this chapter. In Chapter 4, I show that in fact the former constraint, FAITH_R, is just faithfulness to morphological heads (HEADFAITH), which is ranked higher than simple faithfulness constraints.

To summarize, I propose that postaccentuation results from the combination of having a morpheme marked with a floating accent and a constraint that promotes global realization of a lexical accent. The accentuation of words with unaccentable morphemes suggests a split in faithfulness constraints; faithfulness to the root seems to be more important than faithfulness to the inflectional suffix.

Let us now examine how the stress patterns of the word *uranós* ‘sky’ is derived. The tableau in (26) illustrates the derivation. As mentioned above faithfulness is segregated into FAITH_R and FAITH_{InfS}. The ranking between FAITH_R and *DOMAIN is established by intervening constraints, namely, HIERAL and *FLOP. *DOMAIN dominates faithfulness to the inflectional suffix and specifically, DEP(HEAD)_{InfS}. Non-local realization of the lexical accent of the root is at the expense of the inflectional suffix to which a lexical accent is added in the output. Foot-binarity (FTBIN), a constraint that requires feet to be binary,¹³ is ranked below faithfulness to the lexical accent of the root and *DOMAIN. More important demands push stress to the final syllable.

(26)

<i>input:</i> * uran-, -os	FAITH(HEAD) _R	*DOMAIN	DEP(HEAD) _{InfS}	FTBIN
* ☞ a. (ura)(nos)			*	*
* b. u(ranos)		*!		

¹³ FTBIN: Feet are binary under syllabic or moraic analysis (Prince 1980, McCarthy and Prince 1986, Kager 1989, Hayes 1995).

Candidate (26a) surfaces despite the fact that a foot-head has been inserted in the (unmarked) inflectional suffix. Candidate (26b) realizes the accent within the root triggering a fatal violation of *DOMAIN.

The analysis just outlined can also easily account for the emergence of accentual variation when the unaccentable morpheme is a derivational suffix, as I show in Chapter 4. Analogous cases of morphemes with floating accents are exhibited by a number of languages. For instance, Russian and Thompson Salish also have unaccentable morphemes which are discussed in other parts of this thesis.

One may wonder whether words composed of morphemes with floating lexical accents are also subject to prosodic form constraints. The absence of four-syllable words with final stress such as **servitorós* indicates that words with inherently floating accents are indeed targeted by prosodic well-formedness constraints. More specifically, this gap is telling because it shows that not only FAITH(HEAD)_R but also HIERAL is ranked higher than *DOMAIN. The tableau in (27) exemplifies the ranking.

(27)

<i>input:</i> * servitor-, -os	FAITH(HEAD) _R	HIERAL	*DOMAIN
* a. (servi)(toros)			*
* \ b. ser(vito)(ros)		*!	

The most optimal output is the one that realizes the accent of the input and, moreover, complies with the principle of prosodic wellformedness despite the fact that the floating accent emerges within the domain of the root.

In Chapter 2, I provided some arguments against treating pre-accenting suffixes as unaccentable. I assume here that Greek lacks altogether unaccentable inflectional suffixes. In the following section, I present more evidence in support of this view.¹⁴

¹⁴ To my knowledge there is at least one lexical accent system with unaccentable inflectional suffixes. This language is Cupeño, a Tadic language spoken in Southern California. In this language the present perfect plural subject /-wəθ/ and the past imperfect plural subject /-wəθnə/ are unaccentable. Their floating accent lands on the root final syllable. For example, the roots /yaaxa-/ and /maaza-/ are both unmarked but when they combine with one of the

The analysis up to this point suggested that the ranking in (28) accounts for the accentuation of words consisting of an accented or an unaccentable root and an unmarked inflectional suffix. In the following section, I show that the same ranking holds for words that are composed of unmarked roots and marked suffixes. Moreover, these cases shed some light on the ranking between FAITH(HEAD)_R and HIERAL as well as the lower ranked foot-form constraints, namely FTBIN and PARSE-σ.

- (28) ER-R, TROCHEE, FAITH(HEAD)_R, HIERAL >> *FLOP >> *DOMAIN >> DEP(HEAD)_{INFLS} >> FTBIN, PARSE-σ

3.5.3. Nouns with a marked inflectional suffix

3.5.3.1. Accented inflectional suffixes

The segregation of prosodic faithfulness into root and (inflectional) suffix faithfulness is also compelled by the accentuation of words whose lexical accent is introduced by the inflectional morpheme. Moreover, these facts shed light on the relation between HIERAL and FAITH_R.

It is expected that words with an accented suffix conform to prosodic wellformedness as well. However, this prediction is not borne out. Words with unmarked trisyllabic roots and an accented inflectional suffix, e.g. /abariz-(on/ 'prisoner's base (game)-GEN.pl' are stressed on the final syllable, e.g. *abarizón* and not on the penultimate, **abarízon*, as expected. Migration of a lexical accent from the suffix to the root triggers violation of DEP(HEAD)_R; the lexical accent of the suffix is inserted in the root. This is an illegitimate move, because faithfulness to the root is deemed more important than prosodic wellformedness. This is what the tableau in (29) illustrates.

aforementioned suffixes they become accented, *yáaxa-wəə* 'they are saying', *čəmə-máaza-wəə* 'we were giving' (cf. Hill and Hill 1968:236).

(29)

<i>input</i> : abariz-, -(on)	FAITH(HEAD) _R	HIERAL	FAITH(HEAD) _{InflS}
* a. a(bari)(zon)		*	
* / b. (aba)(rizon)	*!		

We conclude that marking originating from inflectional suffixes does not adhere to hierarchical alignment simply because prosodic wellformedness cannot be at the expense of root-faithfulness. Consequently, lexical contrasts are restricted only when they originate from roots. In the light of the new facts, the ranking in (28) takes the following form:

- (30) *ranking for templatic marking in Greek (final version)*
 ER-R, TROCHEE, FAITH(HEAD)_R >> HIERAL >> *FLOP >> *DOMAIN
 >> DEP(HEAD)_{InflS} >> FTBIN, PARSE- σ

3.5.3.2. Pre-accenting inflectional suffixes

In this section, I focus on weakly-accented inflectional suffixes. For this purpose I analyze the words *astráγalu* ‘ankle-GEN.sg’ and *anθrópu* ‘man-GEN.sg’. These examples offer us the chance to take a closer look at cases where MAX(TAIL) is at play and also establish the ranking between the structural constraints PARSE- σ and FTBIN. In addition, they reveal that the emergence of preaccentuation in a system is a consequence of high ranking structural constraints such as ER-R.

Among other grammatical cases, the genitive singular suffix /-u/ is pre-accenting. When this suffix combines with an unmarked root, accentual alternations arise within the paradigm. For instance, in the pairs *astráγa-los* (NOM.sg), *astráγal-u* (GEN.sg) and *ánθrop-os* (NOM.sg), *anθróp-u* (GEN.sg), antepenultimate stress alternates with penultimate between the nominative and genitive singular, respectively. If the root was accented, stress would have been immobile, e.g. *klívanos* (NOM.sg), *klívanu* (GEN.sg). Moreover, in *astráγalos* stress would have been on the penultimate syllable because according to what was argued before, marked four-syllable words do not exhibit antepenultimate stress. Thus, we conclude that penultimate stress must be triggered by the suffix and not by some property of the root.

In Chapter 2 and also at the beginning of this chapter, I claimed that pre-accenting suffixes are weak lexical accents which in a foot-based language like Greek take the form of tails. In other words, they are marked to be in weak foot position. However, this does not entail that they determine the position of the head of the foot. This is controlled by other principles of the language. More specifically, I argue that this is the result of a highly respected ER-R in combination with parsing mechanisms. First, the syllables are parsed into feet. At this point the inherent property of the suffix interferes demanding to be in the tail of a foot. Depending on the position of faithfulness with parsing mechanisms the demand of the suffix can be respected or not. Based on what has been argued before, in lexical accent systems faithfulness constraints are ranked higher than PARSE- σ and FTBIN, therefore the mark of the suffix prevails over constraints that may enforce some other parsing configurations. This is exemplified in the tableau in (31). Note that ER-R is undominated in Greek.

(31)

<i>input: anθrop-, -u)</i>	ER-R	MAX (TAIL) _{InflS}	FTBIN	PARSE- σ
☞ a. an(θrópu)				*
b. (àn)(θrópu)			*!	
c. (án)(θropu)	*!		*	
d. (ánθro)pu		*!		*
e. (anθro)(pú)		*!	*	

Candidate (31a) wins over candidates (31d-e) because it is the only form that respects the inherent tail role of the suffix and satisfies ER-R and FTBIN. Candidate (31d) violates faithfulness because the suffix loses its weak accent. Suffix faithfulness is also violated in (31e) because the suffix loses its accent and, in addition, is stressed. Candidates (31b-c) also respect suffix faithfulness but they are excluded because they violate structural constraints. More specifically, the latter candidate, (31c) fatally violates ER-R. It also violates FTBIN, but this is not so crucial because the constraint is ranked low. The ranking between FTBIN and PARSE- σ becomes relevant for the evaluation of candidate forms (31b) and (31a). They both satisfy faithfulness to the foot-tail accent of the suffix, but only the first is chosen as the most optimal output. Evidence against monosyllabic feet comes from phonetics: unparsed and weakly parsed vowels tend to be reduced in everyday speech and in the Northern Greek dialects, in contradistinction to vowels that head secondary feet (cf. the

discussion in §3.5.1). Notice that foot binarity is ranked higher than the other foot-form constraints.

It is important to emphasize once more that the foot-head preceding the suffix /-u/ does not incur FAITH(HEAD)_R violation¹⁵ because it is the result of structural constraints such as ER-R, FTBIN and PARSE-σ and not a lexical accent imposed by the suffix. Pre-accenting suffixes create an ‘island’ in the string of syllables waiting to be parsed. All the suffix wants is to avoid prominence and be in a weak position. PARSE-σ and FTBIN will parse syllables into feet, nevertheless, taking into account that the prespecified syllable will be a foot-tail in the string. ER-R will stress the rightmost foot.

This analysis predicts that pre-accenting suffixes do not emerge in systems which assign prominence to leftmost feet. This is empirically documented in Russian which exhibits the same marked inventory with Greek with one exception: there are no pre-accenting suffixes. This discrepancy can be easily explained on the basis of the model advanced here. Under Richness of the Base, pre-accenting suffixes can be part of the inventory of marked morphemes but they never have a chance to surface because the word stress rule of the language prefers the left edge of the word.

One may wonder whether pre-accenting suffixes in Greek can be analyzed as unaccentable. Besides the reasons I presented in Chapter 2, there are two more arguments against this hypothesis. First, given the ranking in (30), the floating accent of the suffix will have to be realized locally. FAITH_R will ban realization of the accent beyond the domain of the inflection. Second, there is empirical evidence from cliticization which shows that suffixes like the genitive singular /-u/ cannot be unaccentable. Observe the clitic formations in (32).¹⁶

- (32)
- | | | | | |
|----|-----------------|---|-----------------|---------------|
| a. | o uranós mu | | | ‘my sky’ |
| b. | o klívanòs mu | & | o klivanós mu | ‘my kiln’ |
| c. | ton θàlasón mas | & | ton θálasòn mas | ‘of our seas’ |
| d. | tu ànθropú mu | & | tu ánθropù mu | & |
| | ?tu anθrópu mu | | | ‘of my man’ |

¹⁵ This is a violation of another type of faithfulness which demands input and output vocalic peaks to have identical featural specification (IDENT[F], McCarthy and Prince 1995). This constraint is violated every time a vowel is stressed, even when stress is assigned by the default. This constraint is very low ranked in the system, otherwise words would have been unstressed.

¹⁶ For more information on clitic stress the reader is referred to Nespor and Vogel (1986), Malikouti-Drachman and Drachman (1991, 1992), Arvaniti (1991), among others.

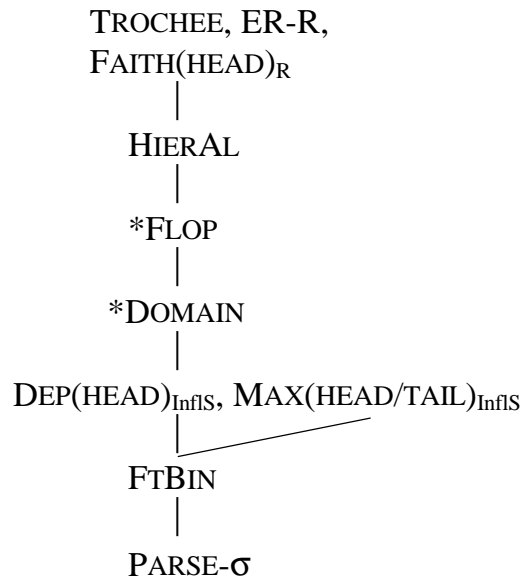
Clitic stress shows that weakly-accented suffixes can bear rhythmic stress as in (32d). In fact, the form with final stress, *tu ànthropú mu*, is more preferred than the one with penultimate stress, *tu anthrópu mu*. If we assume that the genitive suffix /-u/ sponsors a floating lexical accent, then it is difficult to explain why other unaccentable morphemes as in (32a), never host clitic stress. Note that the prosodic mutation of *anthrópu* to *ánthropú mu* is not necessitated by rhythmic constraints governing clitic stress. Patterns like *fantáros mu* ‘my soldier’ are perfectly acceptable. Neither can it be attributed to morphological reasons. There is no difference between accented roots (32b) and accented inflectional suffixes (32c); they both host primary or secondary stress.

If we assume, on the other hand, that the suffix is pre-accenting we can at least claim that the rhythmic principles that govern the accentuation of clitics make a distinction between strong and weak accents. The former define possible positions for stress which must be respected by the prosodic constraints that control clitic stress. On the contrary, the latter do not make a clear statement about prosodic headedness. In this sense, they are easy target to forces that want to impose their own prosodic shape to clitic constructions. This explanation is lost if we assume that the suffix is unaccentable.

To conclude, the theory developed here implies that stress in Greek is semi-predictable. Prosodic restrictions refer only to the prosodic well-formedness of words. It seems that marks want to compensate for their ‘arbitrariness’ by placing themselves in prosodically predictable positions. I must emphasize that this claim is valid as long as inflected words are examined. In languages with morphologically oriented accentuation it is rightly expected accent placement to be dependent on a variety of mechanisms which, ideally, should reflect the morphological complexity of words. I complete the analysis of noun stress with the examination of words with unmarked morphemes.

A summary of the constraints controlling the accentual behavior of marked words is given in (33) together with the examples that justify the ranking at issue.

(33) *ranking for the accentuation of words with one lexical accent*



- FAITH(HEAD)_R >> HIERAL >> FAITH(HEAD)_{InflS} abarizón (29)
- ER-R, HIERAL >> *FLOP servitóros (22)
- *FLOP >> *DOMAIN stafíða (23)
- FAITH(HEAD)_R >> *DOMAIN >> DEP(HEAD)_{InflS} uranós (26)
- >> FTBIN servitóros (27)
- FAITH(TAIL) >> FTBIN >> PARSE-σ anθrópu (31)

3.6. Accentuation of Nouns with No Lexical Accents

Greek is a bounded system that limits the scope of its primary stress to the last three syllables of the word. This is due to ER-R which, together with TROCHEE, are undominated. The constraints that derive antepenultimate default stress are NONFIN(ALITY) and ALIGNPRW-R ranked as NONFIN(ALITY) >> ALIGNPRW-R, PARSE-σ.

- (34)
- a. NONFIN (Prince and Smolensky 1993)
The head of the prosodic word should not stand in final position.
 - b. ALIGNPRW-R (McCarthy and Prince 1993)
Align the right edge of the prosodic word with the right edge of a foot (PrW, R, Ft, R).

These constraints are dominated by faithfulness. They take charge of accentuation only when a word is deprived of lexical accents. This is why the default accentuation is the ‘elsewhere pattern’. The accentuation of a word like *astráγalos* ‘ankle’ is illustrated in (35). The tableau makes clear that ALIGNPRW-R, being in a dominated position, has an effect only for the fourth candidate (35d). ER-R rejects the second candidate (35b) because it violates the three syllable restriction. NONFIN decides that the first candidate (35a) will surface. TROCHEE is respected by all candidates.

(35)

<i>input</i> : astráγal-, -os	TROCHEE	ER-R	NONFIN	ALIGN PRW-R	PARSE-σ
☞ a. a(stráγa)los				*	**
b. (ástra)(γalos)		*!			
c. (àstra)(γálos)			*!		
d. (ástra)γalos				**!	**

3.6.1. Default vs. marking

The accentual facts from Greek help us to have a better understanding of the statistics in §3.4.3 according to which marked patterns are more common than default. Under another theory, one would anticipate an opposite situation. Default is the ‘regular’ or ‘predictable’ pattern, therefore it should be more common. In our model the statistic disparity is not so surprising any more.

Templatic marking leads to words of ideal prosodic form. Marked words have a standard prosodic shape, they always have binary branching. In contrast, words stressed by default have invariant prosodic structure, e.g. *a(stráγa)los* ‘ankle’. Moreover, words composed of marked roots have accentually immobile paradigms, e.g. *fantáros* (NOM.sg), *fantáru* (GEN.sg), as opposed to unmarked words which must endure accentual alternations when combined with accented or pre-accenting suffixes, e.g. *ánthropos* (NOM.sg), *anθrópu* (GEN.sg). As I show in Chapter 4, the immobility of stress in marked words is derived by an asymmetry in the accentual behavior of roots and inflectional suffixes.

The tendency of the system to marginalize the default pattern is further supported by the results of an experiment performed by the author with the help of eighteen native speakers of Greek. Additional evidence comes from a synchronic process that takes place in everyday use of the language.

The purpose of the experimental research was to explore the prevailing preferences for the placement of stress in inflected words. Eighteen subjects (8 females and 10 males) between the age of 23 and 29 years old were asked to place stress on sixty three-syllable and sixty four-syllable nonsense nouns (and adjectives) of various declensions. The results of the survey provide support for the prevalence of the marking patterns. In the group of three syllable words, stress was invariably placed on each one of the three possible positions with a preference for the (ante)penultimate syllable. However, 98.2% of the participating words appears with immobile stress in the morphological environments of stress shifts, namely genitive singular and plural. More strikingly, in four-syllable words 99.17% of the total has fixed stress on the penultimate syllable, the most legitimate position of stress for words of this length, according to the theory presented in this study. (For more details the interested reader is referred to Revithiadou 1997c.) The results of this experiment make it very clear that marking is the productive or more preferred pattern and not the default pattern.

Another argument in support of the prevalence of marking patterns over default comes from a very popular synchronic process that takes place in everyday Greek. It is a very common tendency for Greek speakers to substitute an unmarked root with an accented one as, for example, in the pair *ánthropos* (NOM.sg), *anθrópi* (NOM.pl) instead of *ánθropi*. Wisely, Philippaki-Warburton (1976:264) comments “this alternation has not become established in the language because it involves changes that are counteracted by standardization and education [...] these forms are common among children and uneducated adults but are also used by educated adults who deliberately espouse the demotic idiom.” It is rightly observed that these forms are considered to be less formal and indicative of a non-sophisticated style of speech, a phenomenon that is vitally related to the lingering dissension between the archaic and demotic (popular) forces in the language. However, precisely this type of phenomena show the progressive propensities and the contemporary dynamics of the system.

3.7. Loan Words and Diacritic Marking

We mentioned in earlier sections that loan words exhibit richer accentual patterns than native Greek words. These words have entered the Greek vocabulary from other languages such as English and French but they are only partly adjusted to the native grammar. In Greek, unassimilated loan words are easy to detect because they lack inflection and they also abstain from

derivational processes. They sometimes form compounds of the type [root [word]_{PrW}]_{PrW}, e.g. *paljo-pulóver* ‘lousy pullover’ and cliticize, e.g. *o mànagér mu* ‘my manager’.

It is evident that a “hierarchy of foreignness” (Kiparsky 1968) can be detected by means of several criteria (i.e. morpheme combinatorics, applicability of phonological rules, etc.), a fact which leads to the conclusion that within the Greek lexicon there are subsets of lexical items called *strata*. It will take us too far afield to examine the process of assimilation of foreign vocabulary. Here, I focus on phenomena that are relevant for stress. The accentual patterns displayed by loan words are listed in (36).

- (36) *accentual patterns of loan words in Greek*
- | | | | |
|------------|------------|---------------|--------------|
| a. gól | ‘goal’ | f. selofán | ‘cellophane’ |
| b. fául | ‘foul’ | g. kalorifér | ‘radiator’ |
| c. mamúθ | ‘mammoth’ | h. memorándum | ‘memorandum’ |
| d. mánager | ‘manager’ | i. montgómeri | ‘coat’ |
| e. pulóver | ‘pullover’ | j. kámeraman | ‘cameraman’ |

Strikingly, stress in loan words can occur in every syllabic position even if this implies violation of the three-syllable window. I assume that loan words, also those with antepenultimate stress, always result from inherent accents. The reason is simple; these forms preserve the stress pattern of the language of origin.

The analysis that unfolds itself along the following lines concentrates on four-syllable words which prove to be enlightening for stress phenomena. The basic argument will be that the behavior of lexical accents in loan words is different from the behavior of accents in native Greek words. Following Itô and Mester (1995a,b), I argue that this difference is caused by the fact that foreign elements occupy peripheral strata in the Greek grammar and show a greater degree of resistance to the assimilatory (phonological/ morphological) processes of the host language.

To begin with, there are four-syllable words that pattern as σ +F+F (36g) and σ +F+ σ (36j). It is apparent that both forms fail to form templates due to violation of hierarchical alignment. This is not a surprising observation. There is a crucial difference between loan words and native marked morphemes. Foreign words are stored in the Greek lexicon with a prespecified stress pattern that has been assigned to them by the mother-language. In other words, they are fully-formed words with a stress pattern assigned by a language-particular algorithm. On the contrary, marked elements in Greek are always morphemes, not

(complete) words that bear a lexically assigned accent.¹⁷ Although the origins of marking are radically different in these two cases, I assume the same autosegmental representation for accents.

Interestingly, the loan patterns reform when they succumb to the pressure of the assimilatory process of Greek. The history of some assimilated loans is presented in (37). In (37b-c) both the pre-assimilated and assimilated forms are given.

(37)	<i>loan words</i>		<i>assimilated loan words</i>
	a. aspirine		aspiríni
	b. cow-boy	káuboi	kaubóis ¹⁸
	c. Mohammet	moxámet	moxamétis

It is obvious from the above examples that foreign words undergo a number of changes when becoming part of the native vocabulary. First, they are assigned an inflectional suffix. Second, and more crucial, the stress pattern, originally imposed by the rules of the mother language, is adjusted to the principles of Greek. Starting from (37a), the inherent mark of the foreign word shifts to the right. Due to suffixation, an extra syllable is added resulting in violation of the three-syllable window. Consequently, stress has to move to the right. Interestingly, stress moves two syllables to the right and not one which could also perfectly satisfy the window limitation. A similar stress shift occurs in (37b). This time the stress shift is not caused by the addition of the extra syllable of the suffix. The targeted form already ends in a vowel and morphological nativization is completed with the addition of the consonantal part of the suffix. As soon as an inflection is added to the base, the accent shifts to the right even though boundedness is not threatened, (37c).

Two questions are important: first, why does stress shift to the penultimate and not to the antepenultimate syllable (37a) and second, why does it shift even when the window is not violated (37b-c)?

I assume that when the form leaves the periphery and penetrates more into the core grammar, the inherent accent that represents the stress of the mother-language is dislocated from illegitimate positions and is placed in positions that are acceptable by the principles governing the accentuation of marked words in

¹⁷ I am not particularly concerned in this thesis with the historical details of the origin of marking in the languages examined. Inevitably, diachronic changes in the phonology of Greek (e.g. the loss of quantity sensitivity, the change from a tone accent to a stress accent system, etc.) play a crucial role in the present day accentual make-up of the language.

¹⁸ This word is syllabified as /ka.u.bo.is./. Some speakers use the forms [kaubói] and [moxámet] and their assimilated counterparts, [káubois], [moxamétis].

Greek. This means that marked words of the form σ +F+ σ are restructured into well-formed prosodic words, namely a PrCpd [F+F].

Kiparsky (1968) noted that not all phonological conditions of nativization are equally violable, there is a degree of resistance or foreignness. Itô and Mester (1995a,b), analyzing the loan phonology in Japanese, argue that there is a gradual transition from the *core* of the lexicon that includes the highly nativized or native strata to less nativized, *peripheral* strata of the lexicon. Core elements satisfy all requirements imposed by grammar. However, imported constituents lie on peripheral domains because they show a more intensive resistance to obeying or satisfying the native conditions. Such borrowed forms exhibit a tension between the need to retain structure of the source form (faithfulness constraints) and the need to conform to constraints of the host language. The degree of foreignness results from high ranking faithfulness constraints in the system. The higher the faithfulness constraints, the greater the resistance to assimilation. Thus, the transition from core to periphery is modeled as reranking of faithfulness constraints, where low faithfulness correlates with high nativization.¹⁹ To conclude, variation in the degree of nativization reflects rerankings of faithfulness constraints; nativization never involves reranking of other constraint types. Several theoretical approaches dealing with the issue of co-existence of native and foreign strata in the lexicon follow the same path (cf. Pater 1994, Davidson and Noyer 1997, Inkelas, Orgun and Zoll 1997 for Optimality oriented approaches to loan assimilation).

With reference to Greek, the a-templatic prosodic shape of unassimilated words results from a constraint ranking in which hierarchical alignment and ER-R are both outranked by faithfulness to the inherent accent of the word (FAITH(HEAD)) and its position (*FLOP). It is more vital for foreign words to be faithful to the stress pattern imposed by the language of their origin than to undergo the rules provided by the Greek grammar.

The analysis of the words *kámeraman* and *kalorifér* are presented in the following tableaux. For the former word, the crucial ranking is between ER-R and *FLOP, whereas for the latter the crucial ranking is between *FLOP and HIERAL. In both cases, the most optimal output is the one which is more faithful to the input.

¹⁹ In a recent study Itô and Mester (1998) shed more light on the structure of the phonological lexicon in Optimality Theory. They provide evidence and arguments regarding impossible nativizations, the relation between the structure of faithfulness constraints and the strata and the ranking across strata.

(38) *ranking of prosodic pre-assimilation (peripheral stratum)*

<i>input:</i> (kameraman)	FAITH(HEAD)	*FLOP	ER-R
☞ a. (káme)(raman)			*
b. (kame)(ráman)		*!	

In (38) faithfulness to the lexical accent and its position is ranked above ER-R. The word is not completely assimilated because it violates the three-syllable window requirement. Similarly, in (39) the position of the mark does not lead to the formation of a well-formed prosodic word. This suggests that HIERAL is ranked lower than *FLOP; the loan form is still in the periphery of the grammar.

(39) *ranking of prosodic pre-assimilation (peripheral stratum)*

<i>input:</i> kalori(fer)	*FLOP	HIERAL
☞ a. ka(lori)(fér)		*
b. (kalo)(rífer)	*!	

When the foreign element reaches the core grammar and is, therefore, completely assimilated, its prosodic pattern is substantially improved. This is exemplified in the derivation of the word *kaubóis* in tableau (40).

In such examples, the split in prosodic faithfulness has already taken place. The lexical accent is more eager to move to a position that satisfies both ER-R and HIERAL. The failure of candidate (40b) shows that ER-R moved up to a higher grade. Similarly, the failure of candidate (40c) shows that also HIERAL supersedes *FLOP. In short, at the point of complete assimilation the word-form constraint HIERAL comes between faithfulness to the lexical accent and faithfulness to the position of the lexical accent.

(40) *ranking of prosodic assimilation (core grammar)*

<i>input:</i> (kauboi-, -s)	ER-R	FAITH(HEAD)	HIERAL	*FLOP
☞ a. (kau)(bóis)				*
b. (káu)(bois)	*!			
c. ka(úbo)is			*!	*

The behavior of marking in unassimilated loans is different from the behavior of marking in native words. First, it originates from stress rules and more specifically, from the algorithm of the language it comes from. Second, it is insensitive to prosodic wellformedness constraints till it reaches the core grammar; then it is prosodically reformed according to the constraints that control the accentuation of marked native words. The most important difference, however, is that there is no split in prosodic faithfulness constraints. Faithfulness to the lexical accent as well as to the position of the lexical accent are both ranked higher than any other constraints of the system and together evaluate the candidate set. As we have seen, prosodic faithfulness constraints in the core grammar are both in a dominating and a dominated position. The marking that is attested in borrowed words is named here *diacritic marking*. The ranking that yields diacritic marking is given in (41).

- (41) *ranking for diacritic marking*
 FAITH TO LA & FAITH TO POSITION OF LA >> WORDFORM
 FAITH(HEAD), *FLOP >> ER-R, HIERAL

When the first signs of assimilation show up such as assignment of inflectional morphology or participation in derivational processes the prosodic make-up of the word conforms to the principles of templatic marking.

A positive result of this theory is that it correctly predicts that when foreign words assimilate they become part of the marked and not the default subsystem of the language. This is an argument that antepenultimate stress in borrowed words is not the outcome of default accentuation.

Diacritic marking is not a peculiarity of lexical accent systems. Polish and Spanish foreign vocabulary displays exceptional stress patterns as well. We have shown in Chapter 2 that ‘deviant’ accentual behavior (antepenultimate and ultimate stress) in these languages is closely related to foreign strata of the grammar. There, it was also pointed out that an underlying mark is equivalent to primary stress, although it is often restricted by principles that control window limitations on stress. In Polish, for instance, marks outside the window move to the right as in *univérsitet* ‘university’ or they are superseded by default as in *universitétu* ‘university (GEN.sg)’. We conclude, therefore, that diacritic marking is not an artifact of the analysis. On the contrary, it expresses the core/periphery organization of the vocabulary in natural languages and has correlates even in systems with rhythmic and morphological stress.

To sum up, in this section I introduced a type of marking which is ‘blind’ to prosodic wellformedness principles and characterizes the accentuation of foreign lexical strata. I attributed the ‘deviant’ patterns of foreign words to a

core/periphery organization of the lexicon, according to which degrees of peripherality result from upgrading faithfulness over the constraints of the core grammar.

3.8. Accentuation of Adjectives and Verbs

The present day adjectival declension is more simplified, compared to nouns. Adjectives use a much more confined set of declensional endings for their formation and, interestingly, they often lack accentual alternations within the paradigm. An example of the *-os* (masc), *-a* (fem), *-o* (neuter) class is given in (42).

(42) *adjectives in -os* (masc), *-i* (fem), *-o* (neuter)²⁰

		‘beautiful’	‘big’	‘naive’
a.	NOM.sg	ómorf-os	meγál-os	aγaθ-ós
b.	GEN.sg	ómorf-u	meγál-u	aγaθ-ú
c.	NOM.pl	ómorf-i	meγál-i	aγaθ-í
d.	GEN.pl	ómorf-on	meγál-on	aγaθ-ón

There are three accentual patterns: antepenultimate, penultimate and ultimate stress. However, in contradistinction to the corresponding nominal examples of this class, the adjectival paradigm lacks accentual alternations in the crucial morphological environments such as the genitive singular and plural. The absence of paradigmatic mobility in (42) can be interpreted in two ways: either all roots are marked (including roots of the type /-(omorf-/) or the inflectional suffixes in adjectives lack inherent accentual properties. I see no real reason to prefer one solution to the other. One thing needs to be emphasized here; although all possible positions of stress are exploited, each paradigm exhibits only one stress pattern. This means that there is no arbitrary distribution of stress patterns within the paradigm depending on morphological case (i.e. nominative, genitive, etc.) or number (i.e. singular, plural). Adjectives in /-os, -a, -o/ draw their stress patterns from a Prosodic Compound pool. All templates of the pool, {SMW, LMW, PrCpd}, are employed for the accentuation of their members.

²⁰ Lack of space prevents me from giving the full paradigm of all three genders. Therefore, I cite here only the masculine forms. The other genders decline in the same fashion as the corresponding feminine nouns in *-a* and neuter nouns in *-o*.

Stress in the verb is quite different from stress in other grammatical classes. The difference does not rely so much on fundamental properties of the accentual system, since the three-syllable-window restriction applies uniformly to all categories and the same stress patterns occur in the verb as well as in the noun and the adjective. The difference mainly focuses on how stress is distributed within each grammatical class. In verbs each stress pattern is associated with a particular tense, mood or conjugation. To put it in simple terms, stress in the verbal system is morphologized.

There are two conjugations in verbs, conjugation a' and conjugation b' (Philippaki–Warburton 1970). Their main difference is the formation of the Present tense. Besides the fact that they use different class vowels for the formation of Present (and Past) tense, conjugation a' is primarily stressed on the final syllable of the root, whereas conjugation b' is stressed on the class vowel (cf. Ralli 1988).

(43)	a.	<i>conjugation a'</i>		b.	<i>conjugation b'</i>
	1sg	aláz-o	'change'		aγap-á-o and aγap-ó 'love'
	2sg	aláz-i-s			aγap-á-s
	3sg	aláz-i			aγap-á-(i)
	1pl	aláz-u-me			aγap-á-me
	2pl	aláz-e-te			aγap-á-te
	3pl	aláz-u-n and aláz-u-ne			aγap-á-n(e)

The picture of verbal stress is already quite different from what we have seen in nouns and adjectives. First, specific stress patterns relate to specific morphological constituents: the class vowel of the Present tense in conjugation a' is pre-accenting, whereas the class vowel of the Present tense in conjugation b' is accented. Verbal roots are unmarked, as shown by the past forms *álak-s-a* 'change-PAST-1sg' and *aγáp-i-s-a* 'love-CLASS VOWEL-PAST-1sg'.

3.9. Assessment and Conclusions of Greek Accentuation

The examination of Greek stress made clear that there is a split in the accentual characteristics of unmarked and marked nouns. The former have fixed antepenultimate stress but a variable prosodic pattern and a mobile paradigm. The latter have strictly binary prosodic shape and fixed stress within the paradigm but variable stress across the vocabulary.

We have seen that unmarked words have predictable stress on the antepenultimate syllable as in *astráγalos*, *ánθropos* but mobile stress within the paradigm. Accentual alternations take place when the inflection has an inherent metrical specification as in *astráγalu*, *anθrópu*. Moreover, long words lack binary prosodic structure; they consist of a foot flanked by two syllables, *a(stráγa)los*.

On the other hand, marked words are always binary at the level of the prosodic word. Although three-syllable words display all possible accentual patterns, there is only one accentual possibility for longer words: penultimate stress. Thus, stress is not completely ‘free’; it is restricted by word-form constraints as well as the window limitation of the language. Another desired property that marked words share is paradigmatic stability. Stress is on the same syllable throughout the paradigm when the root has a lexical accent, e.g. *fantáros*, *fantáru*, *fantáro*, etc. This issue is extensively addressed in Chapter 4.

To conclude, marked words have ‘free’ stress but a restricted pool of prosodic shapes. On the contrary, unmarked words (stressed by default) have fixed stress but invariable prosodic structure. Boundedness to the last three syllables is shared by all patterns. The generalization made here strongly supports the view that the language tries to restrict the freedom of marking and make it more accessible to its speakers. The variable stress of *servitóros*, *fantáros*, *uranós*, is balanced by the templatic structure of these words, whereas the fixed stress of *astráγalos* is hammered by its a-templatic shape.

Greek also shows that a language with marking can have ‘exceptional’ stress. Stress in loan words is not hampered by word-form and other structural constraints that operate in the native vocabulary. Any position in a word is a possible host for stress, e.g. *kámeraman*, *montgómeri*, etc. These words are lexically marked as well, but their mark reflects the stress assigned to the word by the canonical stress rules of the donor-language. In other words, diacritic accents are not subject to the prosodic wellformedness constraints of Greek. Loan patterns are still under the influence of their mother-language and hence in peripheral strata of Greek grammar. When the foreign forces yield to the pressures of the core grammar, diacritic marking reforms to templatic.

Once again, I emphasize that the two forms of marking have the same representation but different function, which is expressed as different constraint rankings. In templatic ranking, prosodic faithfulness constraints are split by intervening word-form constraints, whereas in diacritic marking they form an undominated cluster.

- (44) a. *templatic marking*
 FAITH TO LA >> WORDFORM >> FAITH TO POSITION >>
 FOOTFORM
- b. *diacritic marking*
 FAITH TO LA & POSITION >> WORDFORM, FOOTFORM

Greek accentuation gave us the chance to explore the nature of unaccentability and its relation to preaccentuation. Both forms of lexical specification impose stress on a neighboring morpheme. However, as I claimed, their similarity is an epiphenomenon created by the interaction of morphological structure with the prosodic constraints of the language. Postaccentuation arises when the floating accent introduced by the root links to the inflectional suffix. The realization of the floating accent outside the domain of its sponsor is enforced by a structural constraint that urges accents to get over the borders of the morpheme they belong to and become a property of the whole word. On the other hand, preaccentuation is mainly the result of structural constraints. A weakly-accented suffix makes no statement about the position of the prosodic head. This is decided by parsing mechanisms, edgemost rules and the other constraints of the system.

An important conclusion drawn from this brief contact with Greek stress is that there is a split in faithfulness constraints. Faithfulness to the lexical properties of the root is deemed more important than faithfulness to the lexical properties of the inflectional suffix. In Chapter 4, I show that dispersion of prosodic faithfulness constraints reflects morphological differences between these two constituents and more specifically, the fact that the root is the head of the morphological construction, whereas the inflectional suffix is not. We will see that the actual ranking hiding behind $\text{FAITH}_R \gg \text{FAITH}_{\text{Infs}}$ is $\text{HEADFAITH} \gg \text{FAITH}$.

In the second part of this chapter, I examine stress in Russian inflected words with one lexical accent or no lexical accent. The similarities between the two systems are worth looking at.

Russian

Russian is another lexical accent system of the Indo-European family. In this section, I argue that the principles that determine stress in Russian are similar to the ones proposed for Greek. More specifically, I show that marked words are subject to wellformedness constraints, unless they are loans, in which case they

preserve the stress pattern of the mother-language until they start assimilating to the native grammar. I present an overview of how these ideas are structured in the second part of Chapter 3.

After the introduction of the main phonological and morphological characteristics of Russian (§3.10), I provide a list of lexically accented and accentless words (§3.11.1). The study of the patterns displayed by the listed forms leads to the conclusion that some prosodic shapes are missing and some others are less preferred (§3.11.2).

Starting from the unattested patterns, which mainly concern accented words, it is claimed that lexical accents are under the spell of principles that define the prosodic form of a word. More specifically, these patterns are excluded by a constraint that limits lexical accents to positions that guarantee strict binarity between prosodic constituents of the word. Restricted lexical contrasts in marked words are expressed with a ranking in which prosodic faithfulness to the lexical accent dominates prosodic form constraints which, in turn, dominate faithfulness to the position of a lexical accent. The examination of marked patterns originating from roots (§3.12.2) and inflectional suffixes (§3.12.3.) reveals another split in faithfulness. There is strong evidence that inherent accentual properties of roots are given priority over accentual properties of suffixes. The segregation between root- and suffix-faithfulness is given a principled interpretation in Chapter 4. The split in faithfulness is supported by another accentual phenomenon. In Russian only monomoraic suffixes display accentual contrasts. Bimoraic and disyllabic suffixes have predictable initial stress. This is because a structural constraint that imposes a specific accentual pattern to bimoraic and disyllabic suffixes dominates inflectional suffix-faithfulness.

Less favored patterns, which mainly concern unmarked words, are accounted for in §3.13. Words stressed by the default subsystem have predictable stress but are hampered by accentual mobility within the paradigm. This is caused by the fact that unmarked roots are combined with accented suffixes in some grammatical cases and unmarked suffixes in other grammatical cases. The examination of Russian stress is completed with a brief examination of stress in loan words (§3.14) and the remaining syntactic categories (§3.15). The basic facts of Russian accentuation are summarized in §3.16. This chapter is concluded in §3.17.

3.10. Background Information on Russian

The position of stress in Russian cannot be predicted on the basis of the

phonological properties of the word or syllable structure. There are numerous examples of homophonous words with contrasting stress, e.g. *glaskí* ‘peepholes’ vs. *gláski* ‘little eyes’. Evidently, there is no contrast between long and short vowels, although all stressed vowels are longer. Besides stress, the length of any vowel in Russian is affected by its position in relation to stress, its occurrence in an open or a closed syllable, the type of consonant closing the syllable, and so on. More attention to this issue is given in the Appendix.

As with other Slavic languages, Russian has underlying vowels, known as ‘yers’ or ‘fleeting’ vowels, which either surface as mid-vowels or delete depending on the environment, e.g. *kukól* (GEN.pl) vs. *kúkla* (NOM.sg) ‘doll’. As the aforementioned example shows, yers are realized in word final positions or before other yers, but delete when a full vowel follows. For an extensive discussion on yers the reader is referred to Lightner (1965, 1972), Kenstowicz and Rubach (1987), Melvold (1990) and Rowicka (1999). I do not provide an analysis of yers here but I follow Kenstowicz and Rubach (1987) in assuming that yers are floating vowels. When it is necessary, some aspects of interaction between yers and stress are discussed.

Russian is a fusional language like Greek. This means that nominal roots are almost always accompanied by an inflectional ending and, moreover, a single morpheme such as the suffix /-a/ expresses gender, number and case. All words take an inflectional ending. Nouns and adjectives inflect for number, case and gender, and verbs inflect for person, number and tense. Some examples of inflected words are listed in (45).

- (45) *Russian inflected words*
- | | | | | |
|----|-----------------|----------------|----------------------------|---------|
| a. | golová (NOM.sg) | golóv (GEN.pl) | | ‘head’ |
| b. | mólod (masc) | molodá (fem) | mólodo (neut) | ‘young’ |
| c. | vížu (1sg) | vídít (2sg) | víd’at ²¹ (3pl) | ‘see’ |

Undersived words in Russian are composed of a root and an inflectional suffix. However, due to the changeable status of inflectional suffixes with yers, some roots appear to be uninflected as, for example, *golóv* in (45a). The nominative and accusative singular form of masculine and neuter nouns has zero inflection as well, e.g. *vólos* ‘hair’. I propose a morphological segmentation for Russian in which the vowel following the root belongs to the inflectional suffix rather than to the root. First, most suffixes in Russian are vowel initial. Second, if we assume that the vowel /-a/ in *borodá* is part of the root, then we must also invoke a rule of truncation, as shown in (46).

²¹ The notation C’ indicates a palatalized consonant.

- (46)
- | | | | |
|----|-----------|---------------|----------------|
| a. | borodý | /boroda-y/ | ‘beard-GEN.sg’ |
| b. | borodáč | /boroda-ač/ | ‘bearded man’ |
| c. | borodíšča | /boroda-išča/ | ‘little beard’ |

Finally, the base for adjective formation is a bare root. In masculine forms the root is uninflected, e.g. *mólod* ‘young’ but in feminine and neuter forms the root is escorted by the ending /-a/ and /-o/, respectively, e.g. *molodá*, *mólodo*. An analysis that treats the last vowel in the aforementioned examples as part of the root necessitates the existence of three bases for the formation of the adjective, /molod-/, /moloda-/, /molodo-/, and an extra rule of vowel truncation that deletes thematic vowels before vowel initial suffixes like the plural /-y/, *mólod-y*. An alternative analysis that treats the final vowel as part of the suffix is certainly more economical. There is only a bare root in the lexicon which combines with various inflectional suffixes to form the adjectival paradigm.

Native roots are not longer than three syllables. Loan words are sometimes polysyllabic, e.g. *eksperimént* ‘experiment’, *ideólog* ‘ideologist’. Unlike Greek, Russian has a bimoraic word minimum. Monosyllabic words occur in the language but they always constitute a closed syllable, (C)VC. A few examples are listed in (47).

- (47) *monosyllabic words in Russian*
- | | | |
|----|-----|---------|
| a. | ád | ‘hell’ |
| b. | vól | ‘ox’ |
| c. | kón | ‘horse’ |

We infer from the lack of monomoraic content words that mora catalexis is ‘off’. However, final stress in words like *golóv* ‘head-GEN.pl’ suggests that syllable catalexis must be ‘on’ (Kiparsky 1991, Kager 1995, Van de Vijver 1998). Therefore, this pattern is analyzed with a monosyllabic trochee, *go(lóv)* ‘head-GEN.pl’, *go(rý)* ‘mountain-GEN.sg’.

Halle and Vergnaud (1987) and Melvold (1990) analyze Russian as an iambic language. Their main argument is that when a stressed vowel deletes, stress is transferred to the nearest stressable element to the left. The directionality of stress shift suggests an iambic grouping of syllables. For example, in the word *zajóm* ‘loan’, the yer vocalizes because it stands in word-final position. When, however, the genitive inflection is added, /zájOm-a/, the yer is forced to vanish but not the lexical accent it introduces. Instead, the inherent accent is transferred to the left, /zájma/, suggesting that constituents in Russian are grouped in right-headed feet. However, the example Halle and Vergnaud use in support of right-headedness of feet, is an isolated case. It is

related to a general phenomenon found in Russian called ‘stress retraction’. Stress moves from the final syllable in the singular to the penultimate syllable in the plural, e.g. *kolesó* (NOM.sg), *kol’ósa* (NOM.pl)²² ‘wheel’ (cf. Chapter 4). Idsardi (1992) correctly observes that alternations such as *otéc* (NOM.sg) *otcá* (GEN.sg) ‘father’, in which the stress of the unvocalized yer is transferred to the right, are much more common. Such alternations indicate a trochaic grouping of syllables. Moreover, secondary stress clearly reveals a trochaic pattern. The examples in (48a-b) are taken from Jones and Ward (1969:61) and the example in (48c) is taken from Loginova (1995:175).

- (48) *secondary trochaic stress*
- | | | |
|----|--------------------|----------------------|
| a. | (fòto)gra(vjúra) | ‘photogravure’ |
| b. | (mòto)pe(xóta) | ‘motorized infantry’ |
| c. | (rèvo)l’u(ciónnyj) | ‘revolutionary’ |

The controversial issue of vowel reduction in Russian also suggests a trochaic metrical organization of the language. Barinova (1971:101) and Kenman (1975:55) present some examples of extreme reduction in rapid speech. The verb *napisát’* ‘to write’ has several possible pronunciations. One of them is [nʌpsát’] with loss of the unstressed syllable in pre-tonic position. The vowel in the first syllable is preserved because it is the head of the (secondary) foot, (*napi*)(*sát’*). The second pronunciation is even more extreme, [nəpsát’]. Here only the stressed vowel remains unreduced. The word *universitét* ‘university’ would normally be pronounced [universitét] but it is further reduced to [unirstét], a prosodic word composed of exactly two feet, (*unir*)(*stét*). A similar reduction process takes place with acronyms. Here, however, when unstressed vowels are not reduced a secondary stress appears on the initial syllable (Barinova 1975). For example, SSSR ‘USSR’ is pronounced in careful speech as [èsəsésér] and in less careful or formal speech as: [èsəsésér] or even [əsér]. It is obvious that the foot-form is a trochee²³, and vowels in non-head positions are reduced to a schwa.²⁴ Vowel reduction in Russian is examined in the Appendix.

²² Stressed /e/ is pronounced as [o] with palatalization of the preceding consonant.

²³ The trochaic analysis of Russian stress defended here contradicts approaches which claim that Russian is not a foot-based system (Van der Hulst 1996).

²⁴ Compare these reduced forms with the outputs of reduction in a trochaic language like Dutch (Booij 1997, Van Zonneveld 1980, Kager 1989, Van Oostendorp 1995, among others):

/fonologí/	[fonologí]	<i>formal</i>	[fonələγí]	<i>informal</i>
‘phonology’	[fonələγí]	<i>semi-formal</i>	*[fonoləγí]	

Unlike Greek, Russian does not impose any limitation in the position of stress. Later, I argue that in marked words some positions are more preferred than others. When there is no lexical accent, default stress assigns prominence to the leftmost vowel of the word: *skóvorody* ‘frying pan-NOM.pl’. Special attention to the accentuation of accentless words is given in §3.13..

The primary sources for Russian in this study are Halle (1973), Melvold (1990) and a corpus that I compiled from articles, dictionaries and informants. Unless otherwise indicated, the data listed in this chapter (and Chapter 4) is drawn from the aforementioned sources. Important works in Russian stress include Dybo (1981), Illič-Svityč (1963), Halle and Vergnaud (1987), Zaliznjak (1980, 1985), Idsardi (1992), Halle and Idsardi (1995), Halle (1998).

3.11. Accentual Patterns in Nouns

3.11.1. The facts

Russian is a root-inflected language. This means that nominal roots are almost always accompanied by an inflectional ending. Feminine nouns fall into two declensions depending on whether the nominative singular ends in a consonant or the /-a/ inflection. For the purpose of the present discussion, I draw most examples in (49) and (50) from neuter class *-o* nouns and feminine class *-a* nouns. This small sample, however, gives an overall view of the attested accentual patterns in the Russian noun. I also included a number of loan words in (51) which shed some more light on important aspects of Russian stress.

(49)	<i>neuter nouns in -o</i> (NOM.sg), <i>-a</i> (NOM.pl)		
	a. zérkalo	a'. zerkalá	‘mirror’
	b. právilo	b'. právila	‘rule’
	c. bolóto	c'. bolóta	‘swamp’

The comparison between (49a) and (49b) is telling. Both have initial stress in the singular forms but diverge in the plural forms; the former example shifts stress to the ultimate whereas the latter preserves stress on the initial syllable. Stress is stable in (49c) as well, although here it lies on the penultimate syllable. We conclude from the above that first, some paradigms are alternating and some others are not, and second, stress can occur in more than one syllable in the word.

The alternating patterns in (49a) suggest that the root is unmarked and hence stressed on the initial syllable by default. However, the nominative plural suffix

seems to be stress-attracting because stress moves from the (default) initial position to the ending. The stability of stress in the other examples is due to the accent of the root. The examples also suggest that when the accent of the root conflicts with the accent of the suffix as in (49b') and (49c'), it prevails. Such cases are elaborately examined in Chapter 4. In this chapter, the focus is on words with one accent like the ones listed in the leftmost column. Neuter nouns in /-o/ also have members with final stress such as *oknó* 'window'. However, stress shifts to the penultimate syllable in plural, *óknam* (DAT.pl). This type of accentual shift is of a different nature than the ones described here because it is not triggered by the suffix. These and other similar cases of accentual allomorphy are allotted a special section at the end of Chapter 4. Some more information needs to be introduced in order to fully understand this phenomenon. Now, feminine nouns pattern as follows:

(50)	<i>feminine nouns in -a</i> (NOM.sg), <i>-y</i> (NOM.pl)		
a.	skovorodá	a'. skóvorody	'frying pan'
b.	golová	b'. gólovy	'head'
c.	rýba	c'. rýby	'fish'
d.	jáščerica	d'. jáščericy	'lizard'
e.	rabóta	e'. rabóty	'work'
f.	čečevíca	f'. čečevícy	'lentil'
g.	lad'já	g'. lad'jí	'rook'
h.	gospožá	h'. gospoží	'lady'

The first two examples, (50a) and (50b) have mobile stress; the nominative singular suffix is accented, whereas the plural ending and the root are unmarked. A word composed of unmarked morphemes is stressed on the initial syllable by default. The examples in (50c-f) have stable stress on a syllable of the root, indicating that the root is accented. The words in (50g-h) are also interesting. Stress is on the ultimate syllable suggesting that the root is unmarked as in (50a) and final stress is probably assigned by the suffix. However, the consistent occurrence of stress on the final syllable throughout the paradigm suggests that the root is unaccentable like the Greek root /*uran-*/. More on this issue is presented in §3.12.2.2.

Another important characteristic of these examples is the absence of four-syllable words with antepenultimate stress. This gap proves once more to be crucial for the analysis. Antepenultimate stress is found, however, in loan words mainly of Greek origin, as demonstrated in (51). There also some other loans with final stress. More attention on this part of the vocabulary is provided in §3.14.

- (51) *loan words*
- | | | | | |
|----|-------------|-----|-------------|------------------|
| a. | antropólog | a'. | antropólogi | 'anthropologist' |
| b. | psixólog | b'. | psixólogi | 'psychologist' |
| c. | istórija | | | 'history' |
| e. | múzyka | | | 'music' |
| f. | eksperimént | | | 'experiment' |
| g. | akvarél' | | | 'water-color' |
| h. | balerína | | | 'ballerina' |

The inherent accentual properties of the morphemes reviewed in (49) and (50) are set out in (52). Morphemes in Russian can be unmarked (52a) or marked (accented or unaccentable) (52b).

- (52) *accentual properties of morphemes*
- | | | |
|--------------------|-----------|---------------------|
| a. <i>unmarked</i> | | |
| zerkal- | skovorod- | golov- |
| -o | -y/-i | |
| b. <i>marked</i> | | |
| <u>accented</u> | | <u>unaccentable</u> |
| (pravil- | bo(lot- | lad'- |
| (ryb- | ra(bot- | <u>gospož-</u> |
| (jaščeric- | čeče(vic- | |
| -((j)a | | |

Some interesting gaps are observed; there are no pre-accenting suffixes. More importantly, the marked/unmarked opposition is only witnessed in monosyllabic suffixes. Disyllabic suffixes (for example, *-aja* (NOM.sg.fem), *-oje* (NOM.sg.neuter)) and suffixes of the shape *-VC* (for example, *-am* (DAT.pl), *-ax* (LOC.pl), *-ov* (GEN.pl.masc)) are stressed on their initial peak (provided that the root is unmarked). As I show in the following sections, restricted accentual patterns in inflectional suffixes is a simple matter of ranking a structural constraint above faithfulness.

Marked accented morphemes have a prespecified lexical accent which in a foot-based system can function as a foot-head, if strong, or as a foot-tail, if weak. The latter category of marking does not surface in Russian for reasons that will become clear soon. The prosodic faithfulness constraint that demands preservation of an input lexical accent is MAX(HEAD/TAIL). This constraint is satisfied when a lexical accent is preserved in the output and violated when it is lost. DEP(HEAD/TAIL), on the other hand, is a constraint that prohibits insertion

of a lexical accent. It is violated when a lexical accent (from neighboring morphemes) is inserted in a root or an inflectional suffix. As in Greek, I refer collectively to both constraints as ‘FAITH(HEAD/TAIL)’ when there is no reason to distinguish between the two.

Russian also has unaccentable morphemes, that is morphemes equipped with a floating accent. The floating accent is usually realized outside the morpheme that sponsors it, unless there is no available segmental material. In this case the accent lodges at the right edge of its sponsor as in *gospóž* ‘lady-GEN.pl’. The migration of a lexical accent is enforced by *DOMAIN, whereas the specific edge a lexical accent anchors to is determined by an alignment constraint.

3.11.2. Common patterns and gaps

The table in (53) summarizes all empirically attested patterns of roots and inflectional suffixes in Russian. As a first remark, native words have a more restricted set of accentual choices compared to loan words. Also structurally the two vocabularies diverge; loan words often exceed the size of native words.

(53)

accentual pattern	1σ ROOTS	2σ ROOTS	3σ ROOTS	4σ ROOTS	SUFFIX
unmarked	zub-	golov-	skovorod-		-y/-i
marked accented	(ryb-	ra(bot- (pravil-	čeče(vic- (jaščeric- *σ(σσ-	eksperi(ment antro(polog i(storija ?(σσσσ	-(a -ami
unaccentable	<u>lad</u> '-	<u>gospo</u> ž-	* <u>σσσ</u> - ²⁵		

A few observations are drawn from the table in (53). Four-syllable words hardly ever have antepenultimate stress, *če(čevic-. This pattern occurs only with words of foreign origin such as the Greek *istórija* ‘history’. Stress in words of foreign origin seems to have more freedom, since it readily occurs in every possible syllabic position. It is surprising, though, that examples with initial stress are not found. This can be explained if one takes into consideration that foreign words bear the stress of another language. Most words are imported from Greek, English or French, all languages that limit stress to the right edge of

²⁵ I found two examples in which the root is polysyllabic and unaccentable: *karandáš* (NOM.sg) ‘pencil’ and *sekretár* (NOM.sg) ‘secretary’. I treat these forms as exceptions to the generalization proposed here.

the word. On the other hand, based on what is argued for Greek, it is more plausible to assume that foreign words enter with a mark (that is, the stress assigned by the language of origin) rather than to argue that they are stressed by default. The latter presupposes some degree of assimilation that usually foreign words obtain only with time. In fact, if Russian behaves like Greek, our theory predicts that when loan words assimilate, their prosodic structure is similar to the prosodic structure of native words that have a lexical accent. Assimilation will not target patterns produced by the default because the foreign elements are introduced right from the beginning with a mark.

According to Levin (1978), the vast majority of nouns, namely 92.02% (approximately 30.000, including derived nouns) have fixed accent on some syllable of the root. However, 150 nouns composed of unaccentable ('post-accenting') roots exhibit the following alternations from the singular paradigm to the plural one: *kolesó* (NOM.sg), *kolesú* (DAT.sg) but *kol'ósa* (NOM.pl), *kol'ósam* (DAT.pl) 'wheel' instead of the expected **kolesá* and **kolesám*. These alternations indicate that the floating accent of the root moves from the suffix to the root in the plural paradigm. Final stress originating from unaccentable roots is less preferred; only 6.7% (2.200 nouns) exhibit this pattern. Unmarked words constitute a marginal group in the nominal vocabulary. Only 350 lexical items (1.07%) are composed of unmarked roots. From this percentage, some unmarked roots convert to accented in plural, e.g. *ózero* (NOM.sg), *ózeru* (DAT.sg) but *oz'óra* (NOM.pl) 'lake' instead of the expected **ozerá*. (Special emphasis on these alternations is given in Chapter 4.) The statistical discrepancy between marked and unmarked words is examined in some detail in the following sections and especially, at the end of this chapter. For the moment it is more important to explain why some patterns are preferred to others.

3.12. Accentuation of Nouns with One Lexical Accent

3.12.1. Templatic marking in Russian

Native Russian words have a templatic shape. They exhibit a range of prosodic templates ranging from SMW to PrCpds. The table in (54) presents the templatic patterns of marked words in Russian. Unattested patterns are also indicated in this table. The pool for the Russian marked nouns is a Prosodic Compound.

(54) *prosodic compound pool in marked words*

a. (rýba)	c. ra(bóta)	f. (čeče)(víca)
b. la(d'já)	d. (právi)lo	g. (jášče)(rica)
	e. (gospo)(žá)	g. *σ(σσ)σ
		i. *σ(σσ)(σ)
		j. *(σσ)σ(σ)

In the previous section we established the trochaicity of Russian; a handful of phenomena, ranging from secondary stress to vowel reduction and directionality of stress shifts caused by vowel deletion, underline the need of the trochee in the language. The existence of monosyllabic feet under primary stress is not surprising given that the language allows for monosyllabic words. As in Greek, monosyllabic feet result from inherent marking properties of morphemes. Monosyllabic feet in other than the primary stressed position are prohibited, e.g. *(σ)(σσ). In short, syllables are parsed into binary feet unless faithfulness requirements to a lexical accent enforce a monosyllabic foot. The reader can find more information on trochaic footing as well as the phenomenon of vowel reduction in Russian in the Appendix at the end of this chapter.

To conclude, lexical marks occur in unmarked positions in Russian as well. This implies that wellformedness constraints restrict the possible positions of lexical accents. In the next section, I proceed with the analysis of the patterns in (54).

3.12.2. Nouns with a marked root

3.12.2.1. Accented roots

As in Greek, I propose that templatic marking results from the ranking FAITH TO LA >> WORDFORM >> FAITH TO THE POSITION OF LA >> FOOTFORM. More specifically, the wellformedness constraint HIERAL, as defined in (18), outranks *FLOP, the constraint that keeps an accent fixed to its lexically pre-assigned vocalic peak. The proposed ranking is given in (55). Keep in mind that TROCHEE in Russian is undominated.

(55) *proposed ranking for templatic marking (first version)*
 TROCHEE, FAITH(HEAD), HIERAL >> *FLOP

Let us see how the ranking in (55) accounts for the stress pattern of *čečevícy* ‘lentil-NOM.pl’. I take the nominative plural form to be our case study because the core theme of this chapter is the accentuation of words with one mark. The marked element in our example is the root. A small set of potential input roots drawn from a theoretically infinite pool is given in (56).²⁶

- (56) *inventory of possible inputs for the root ‘čečevic-’*
- a. če(čevic-
 - b. čeče(vic-
 - c. čečevic-

Let us take the form *če(čevic-* (56b) as a possible input. To derive the correct output with (56b) as input, HIERAL must occupy a rank from which it can influence the position of lexical accent. This is accomplished when HIERAL >> *FLOP. If the proposed constraint ranking is correct, then the right result is achieved with any of the other bases as an input form.

(57)

<i>input: če(čevic-, -y</i>	FAITH(HEAD)	HIERAL	*FLOP
☞ a. (čeče)(vícy)			*
c. če(čevi)(cý)		*!	*
b. če(čévi)cy		*!	

The tableau in (57) makes clear that the correct pattern arises when HIERAL dominates *FLOP. Candidate (57a) wins over candidates (57b) and (57c) because it is binary: it consists of exactly two binary feet.

It is not clear from the tableau in (57) whether it is a general tendency of lexical accents to move to other positions of the word or whether migration is necessary for the sake of wellformedness. Words like *rabóty* ‘work-NOM.pl’, however, suggest that the lexical accent is not eager to move when its lexical position complies with hierarchical alignment. This suggests that *FLOP dominates *DOMAIN although it is dominated by HIERAL. The effects of this ranking are shown in (58).

²⁶ Richness of the Base maintains that a lexical accent can be located to any possible position within the word. Lexicon Optimization (Prince and Smolensky 1993, Itô, Mester and Padgett 1995) will choose the representation that incurs the fewest constraint violations of high ranked constraints as the most harmonic input. Thus, the representation /jaščeric-/ will be preferred over /jašče(ric-/ for the output form *jáščerica* and similarly, /ra(bot-/ will be preferred over /rabot-/ for the output form *rabóta*.

(58)

<i>input</i> : ra(bot-, -y	*FLOP	*DOMAIN
☞ a. ra(bóty)		*
b. (rabo)(tý)	*!	

To conclude, the examples presented in this section make clear that there is a split in faithfulness: faithfulness to the lexical accent is high ranked but faithfulness to the lexical position of an accent is dominated by hierarchical alignment, a constraint that requires every prosodic constituent in a marked word to be properly aligned with the prosodic constituent that contains it. The result of the ranking in (55) is a restricted number of accentual contrasts and predictable prosodic shape for marked words. There are positions that can never host a lexical accent.

The restrictive effects of hierarchical alignment are evidenced by words composed of unaccentable roots which are the subject of the following section. Moreover, the facts discussed below show that a floating accent sites at the right edge of its sponsor when there is no available segmental material to host it.

3.12.2.2. Unaccentable roots

In some roots the lexical accent is not linked to a particular vocalic peak. This accent is floating. A floating accent is not subject to the anti-migration constraint *FLOP and hence can be realized anywhere in the word. As in Greek, *DOMAIN ensures that the best position for a floating accent is the inflectional suffix, or at least a morpheme other than its sponsor. Thus, most unaccentable roots have their accent located on the inflection as in *gospoží* ‘lady-NOM.pl’. Interestingly, the Russian examples shed some new light on the issue of unaccentability. Some grammatical cases have zero inflection. The absence of inflection forces the floating accent to land on the root. Thus, the genitive plural form of *gospoží* is shaped as *gospóž*.

Two generalizations are drawn from the above form. First, the lexical accent must be realized in the output and not vanish. Thus, MAX(HEAD) must be high ranking. With FAITH in high ranks, the constraint responsible for the global distribution of the floating accent, namely *DOMAIN, cannot exert any force to thwart its violation. The low ranking the latter constraint occupies in the hierarchy discards any possible scenario towards its satisfaction. No other constituent than the root itself can harbor the floating lexical accent.

Second, the same form reveals the preference for rightmostness. When there is no other place to go, the lexical accent settles at the right edge of the word. Rightmostness is triggered by the following constraint:

- (59) ALIGN-R(LA, PrW, R)
Align a lexical accent to the right edge of the prosodic word.

The facts from inflectional morphology do not reveal whether ALIGN-R is in conflict with *DOMAIN. This becomes clear later when derived words are examined. The ranking between FAITH(HEAD), however, and *DOMAIN is fixed; the lexical accent should not get lost, even if this implies that it has to link to its sponsor. (The ranking between FAITH(HEAD) and ALIGN-R is established by intermediate constraints like *FLOP which must dominate ALIGN-R because in the word *rabóta* stress remains fixed on the root.) Let us examine now the accentuation of the word *gospóž*.

In (60), we see a concrete instance of the effects of ALIGN-R. Note that the constraint evaluates gradiently, counting syllables. Since the two candidate forms tie on FAITH(HEAD) by respecting it, and on *DOMAIN by violating it, the decision between them depends on the rest of the hierarchy. ALIGN-R is the constraint that appoints the first candidate, (60a), as the most optimal one. Candidate (60c) deletes the underlying lexical accent and is stressed by default (leftmost stress) on the initial syllable.

(60)

<i>input:</i> * gospož-	FAITH(HEAD)	ALIGN-R	*DOMAIN
* ☞ a. go(spož)			*
* b. (gospož)		*!	*
c. (góspož)	*!		

To conclude, with zero inflectional suffixes the floating lexical accent is realized at the right edge of its sponsor. If ALIGN-R was not in force, we would expect the form **góspož* with initial stress to emerge under the influence of the low ranked default constraints (cf. §3.13).

We continue with the accentuation of the word *gospožĩ*. This form provides evidence for another split in prosodic faithfulness. In order to preserve the lexical accent of the root and comply to *DOMAIN, a lexical accent is inserted in the inflectional suffix. This suggests that faithfulness to the root is deemed more

important than faithfulness to the suffix. A similar situation is witnessed in Greek where I also proposed that faithfulness constraints must be divided into FAITH_R and FAITH_{INFLS} with FAITH_R top-ranking. This segregation is also motivated by the accentuation of words with conflicting accents where the lexical accent of the root is given priority over the lexical accent of the inflectional ending. In fact, in Chapter 4 the ranking FAITH_R >> FAITH_{INFLS} is restated as HEADFAITH >> FAITH. Faithfulness to the morphological head is deemed superior to simple faithfulness.

The tableau in (61) presents the accentuation of the word *gospož*. Notice that FTBIN is sacrificed for the sake of FAITH and *DOMAIN. It has a limited power to form outputs from the rank it occupies.

(61)

<i>input:</i> * gospož-, -i	FAITH(HEAD) _R	*DOMAIN	DEP(HEAD) _{INFLS}	FTBIN
* ☞ a. (gospo)(ž-i)			*	*
* b. (gospo)ž-i		*!		
c. góspož-i	*!			

The proposed ranking brings out the correct result. The candidate-comparison shows that underparsing of the lexical accent, as in candidate (61c) (which is stressed by default on the initial syllable), can never bring the form into agreement with FAITH(HEAD)_R because in this case there is no accent in the output. Moreover, *DOMAIN must dominate suffix faithfulness (DEP(HEAD)_{INFLS}). This way the floating accent can be allotted a position outside its sponsor. The ranking between HIERAL and *DOMAIN is shown in (62). This tableau presents the accentuation of the word *čečevícy* ‘lentil-NOM.pl’ with an unaccentable root as input this time. The result is always a word with penultimate stress in compliance with the principle of prosodic wellformedness.

The second candidate, (62b) is properly aligned but stumbles on prosodic wellformedness, enforced through dominant HIERAL. The third candidate, on the other hand, is both misaligned and a-templatic. The winner (62a), is chosen by minimal violation of ALIGN-R.

(62)

<i>input:</i> * čečevic-, -y	FAITH (HEAD) _R	HIERAL	ALIGN-R	*DOMAIN
* ☞ a. (čeče)(vicy)			*	*
* b. (čeče)vi(cy)		*!		
* c. če(čevi)cy		*!	**	*

At this point, the analysis of Russian words with marked roots is complete. We have seen that the same set of constraints in almost unaltered domination order, accounts for the accentuation of marked words in Russian as well as in Greek. As I show in §3.13, the differences between the two accentual systems relate to their rhythmic aspects. The next section deals with the accentuation of words composed of unmarked roots and marked suffixes. Before concluding this section, I present in (63) a summary of the constraints and their respective rankings as they have been established by the facts reviewed so far.

- (63) *ranking for templatic marking in Russian*
 TROCHEE, FAITH(HEAD)_R, HIERAL >> *FLOP >> ALIGN-R, *DOMAIN
 >> DEP(HEAD)_{INFLS} >> FTBIN

3.12.3. Nouns with a marked inflectional suffix

From all inflectional suffixes in Russian only monosyllabic ones of the shape -V exhibit lexical contrasts. Disyllabic suffixes as well as ones with a closed syllable lose stress after marked roots but attract stress from unmarked ones. It is not so reasonable to assume that all -VCV and -VC are marked because their ‘markedness’ is predictable by their prosodic shape. In this section, I propose that restricted accentual contrasts in inflectional suffixes arise from domination of FAITH_{INFLS} by a structural constraint which enforces predictable stress to suffixes of a specific prosodic make-up. Once more, the facts suggest a split between root-faithfulness and inflectional suffix-faithfulness. Before exploring the accentual patterns of these suffixes let us first have a closer look at words composed of an unmarked root and an accented monosyllabic (-V) inflectional suffix.

3.12.3.1. Accented inflectional suffixes

In order to show that prosodic wellformedness does not apply to marked suffixes I will take the form *skovorodá* ‘frying pan-NOM.sg’ as an example. Obviously, this word does not conform to binarity. It consists of a foot, a syllable and another foot, (*skovo*)*ro(dá)*.²⁷ This pattern can be easily explained if we take into account FAITH_R; satisfaction of HIERAL implies the insertion of a lexical accent to the root but this is an illegitimate move given the ranking FAITH_R >> FAITH_{InfS}. There is no way to comply to HIERAL and FAITH_R at the same time. Since the output form is a-templatic we assert that FAITH_R must be ranked higher than the word-form constraint. This is illustrated by the tableau in (64).

(64)

<i>input</i> : skovorod-, -(a)	FAITH (HEAD) _R	HIERAL	FAITH (HEAD) _{InfS}	FTBIN
☞ a. (skovo)ro(dá)		*		*
b. (skovo)(róda)	*!			

Even if the input specification of a suffix is a floating accent, (64a) would still be the optimal output. FAITH_R in combination with ALIGN-R would favor a word with the accent on the suffix.

To conclude, templatic marking does not apply to accents originating from roots. Top-ranking of FAITH_R bans the insertion of suffixal accents, which strive to satisfy prosodic wellformedness.

3.12.3.2. Bimoraic inflectional suffixes

As noted above, not all suffixes have unpredictable stress. Disyllabic suffixes (65a-c) and suffixes that consist of a closed syllable (65d-e) are stressed when combined with unmarked roots: *golov-ámi* ‘head-INSTR.pl’, *skovorod-áx* ‘frying pan-LOC.pl’, *molod-ája* ‘young-NOM.sg.fem’, *molod-óje* ‘young- NOM.neut.sg’, etc.

(65) -VCV and -VC suffixes

a. -ami	‘INSTR.pl’	d. -ax	‘LOC.pl’
b. -aja	‘NOM.sg.fem’	e. -ov	‘GEN.pl’
c. -oje	‘NOM.sg.neut’		

²⁷ Cf. the Appendix for justification of the footing (*skovo*)*ro(dá)* instead of *sco(voro)*(*dá*).

Instead of stipulating that all these suffixes are equipped with a lexical accent by coincidence, I propose a different solution. Both groups of suffixes share one property: they are bimoraic. In other words, they have the shape of a SMW. Consequently, the generalization is that bimoraic suffixes, or suffixes that have the size of a SMW, are stressed. I express this generalization with the constraint in (66).

(66) SUFFIX=SMW > ALIGN-L

The constraint in (66) is in fact composed of two independent constraints that stand in implicational coordination (A > B):²⁸ If SUFFIX=SMW (A suffix has the size of a SMW), then ALIGN-L (Align a peak at the left edge of a suffix). If a candidate passes constraint A (SUFFIX=SMW) then it is evaluated with respect to constraint B (ALIGN-L). If it passes B, it moves to the next constraint of the hierarchy. But if it fails B, it is cast out of the competition. If a candidate fails A, it is then rejected even if it satisfies B. (Cf. Crowhurst and Hewitt 1997 for a theory of coordinated constraints.)

Having the constraint in (66) above, FAITH_{InflS} guarantees predictable stress for bimoraic suffixes but unpredictable stress for monomoraic inflectional suffixes. The tableau in (67) shows how the constraint at issue eliminates lexical contrasts for the suffixes in (65).

Assume that the suffix /-ami/ in *gubámi* ‘lip-INSTR.pl’ is accented on the final syllable, -a(mi). Its accent will never survive in the output. The coordinated constraint casts out the second candidate because it crucially violates SUFFIX=SMW. Note that this constraint evaluates gradiently, counting syllables and not segments. FAITH is not given a chance to determine the output. The result rests totally upon the coordinated constraint.

(67)

<i>input</i> : gub-, -a(mi)	SUFFIX=SMW > ALIGN-L	FAITH(HEAD) _{InflS}
a. gu(bámi)		*
b. (guba)(mí)	(* *! *	

Note that the winning candidate does not violate *FLOP although it deletes the underlying accent of the suffix. Faithfulness to the association line is relevant only when a lexical accent and the vocalic peak that bears it stand in

²⁸ Two constraints can be coordinated only when they share the same ‘focus’, that is a linguistic object referred to directly in the statement of the constraint (Crowhurst and Hewitt 1997). The suffix is the focus of the coordinated constraints here.

correspondence. In candidate (67a) the vocalic peak that bears the accent in the input, namely /-i-/, is not in correspondence with its lexical accent in the output simply because the lexical accent is lost.

It is evident from the above that a monomoraic suffix can never pass SUFFIX=SMW and, consequently, be evaluated by ALIGN-L. It has to move to the next constraint of the hierarchy, namely FAITH in order to be evaluated. This explains why lexical contrasts are restricted to monomoraic suffixes.

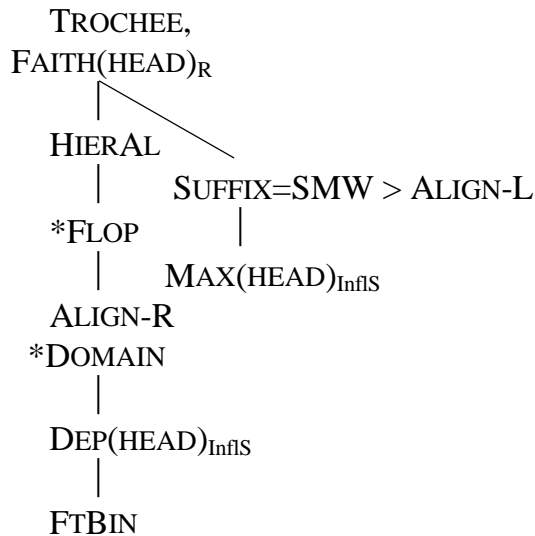
FAITH_R, on the other hand, outranks the coordinated constraint. Stress in bimoraic suffixes gives way to the lexical accent of the root. This is shown in (68).

(68)

<i>input:</i> (ryb-, -ami	FAITH(HEAD) _R	SUFFIX=SMW > ALIGN-L
☞ a. (rýba)mi		(*) *
b. ry(bámi) ²⁹	*!	

In (69) I present a tree with the domination order of all constraints participating in the accentuation of nouns. The same hierarchy holds for the other grammatical categories as we will see later in this study. The numbers refer to the tableau in which the ranking at issue is established or examples that demonstrate the effects of a particular constraint.

(69) *ranking for the accentuation of words with one lexical accent*



²⁹ A candidate output in which the lexical accent of the root /ryb-/ moves to the suffix /-ami/ is ungrammatical because it violates *FLOP.

- FAITH(HEAD)_R >> HIERAL skovorodá (64)
- HIERAL >> *FLOP čečevícy (57)
- *FLOP >> ALIGN-R, *DOMAIN rabóty (58)
- FAITH_R >> ALIGN-R, *DOMAIN >> DEP(HEAD)_{InfIS} gospóž (60)
- >> FTBIN gospoží (61)
- HIERAL >> ALIGN-R, *DOMAIN čečevícy (62)
- SUFFIX=SMW > ALIGN-L >> FAITH(HEAD)_{InfIS} gubámi (67)
- FAITH_R >> SUFFIX=SMW > ALIGN-L rubámi (68)

3.13. Accentuation of Nouns with No Lexical Accents

As already mentioned, the default option in Russian is leftmost stress. This stress pattern is enforced by the constraint in (70).

- (70) EDGEMOST-L
A peak of prominence lies at the left edge of the word.

This constraint is ranked below faithfulness because it takes effect only when there are no lexical accents in the string. The same constraint is responsible for secondary stress on the initial syllable in words like *rèvol'uciónnyj* 'revolutionary' (the specific conditions are spelled out in the Appendix).

The tableau in (71) illustrates the accentuation of the unmarked word *skóvorody* 'frying pan-NOM.pl'. TROCHEE is undominated rejecting candidates with no trochaic patterning such as (71c). EDGEMOST-L is decisive; violation of this constraint casts out candidate (71b) and appoints the first candidate, (71a), as the winner.

(71)

<i>input</i> : skovorod-, -y	TROCHEE	EDGEMOST-L
☞ a. (skóvo)(rody)		
b. sko(vóro)dy		*
c. (skovó)rody	*!	*

I have argued several times in this study that pre-accenting suffixes cannot surface in Russian. Here I show why this is the case. Recall that suffixes marked for tails do not introduce a strong accent. They are just specified to be in the dependent position of a foot. Let us assume for the sake of the argument that the plural suffix /-y/ has a weak accent. As the tableau in (72) makes clear, the foot created by the suffix will never host stress because EDGEMOST-L assigns a peak

to the leftmost syllable of the word. The foot that hosts the suffix is given no chance to surface.

(72)

<i>input</i> : skovorod-, -y)	TROCHEE	FAITH(TAIL)	EDGEMOST-L
a. (skovo)(rody)			
b. (skovo)(ródy)			*!

To conclude, marking in Russian is more forceful than default in assigning primary stress. The majority of words in lexical accent systems have prominence on an inherent accent and not on a syllable determined by the default algorithm. An analogous situation is witnessed in Greek. A number of reasons justify the statistical disparity. I repeat here the most important ones. First, marked words have unpredictable stress but a limited pool of prosodic shapes. This is because prosodic form constraints control the distribution of lexical accents. Second, marked words dispense with the problem of accentual alternations within the paradigm. Accented roots guarantee columnar paradigmatic stress.

These reasons together with other ones that are brought to light in the remaining chapters of this study, suggest that it is not so remarkable that marked words are favored more than others. One may wonder though, whether marked words become unmarked. To my knowledge, such accentual alterations have not been attested. In Chapter 4, I argue that marking in head-dependent systems aims at reflecting morphological structure to prosody. Thus, usually the changes that take place in the Greek and Russian system are in conformity to this basic goal of the language. Now, it is time to look into the accentual behavior of Russian loan words.

3.14. Periphery and Diachrony: Keys for Synchrony

We have seen that foreign words in Russian exhibit richer accentual patterns than native words. For instance, words such as *psixólogi* ‘psychologist-NOM.pl’ are obviously non-binary at the level of prosodic word. Unlike Greek, Russian morphology seems to be more liberal since it assigns inflectional endings to all loan words. Consequently, only phonological criteria (i.e. stress, phonotactics, syllable combinatorics, etc.), can be used to check the degree of nativization that a loan word exhibits. Below I list the accentual patterns displayed by foreign words in Russian.

- (73) *accentual patterns of loan words in Russian*
- | | | | |
|-----------|----------|----------------|---------------|
| a. gáz | ‘gas’ | e. xarákter | ‘character’ |
| b. sféra | ‘sphere’ | f. akvarél’ | ‘water-color’ |
| c. effékt | ‘effect’ | g. polítika | ‘politics’ |
| d. múzyka | ‘music’ | h. balerína | ‘ballerina’ |
| | | i. eksperimént | ‘experiment’ |

Four-syllable words (73g-i) attract our interest. Evidently, shorter forms are prosodically well-behaved. The non-binary data in (73) call for some explanation. First, the pattern $\sigma(\sigma\sigma)\sigma$ in (73g) is displayed mainly by Greek borrowings ending in /-ika/ and Greek compounds. Some examples are given in (74).

- (74) *loan words from Greek*
- | | |
|-------------|------------|
| a. dinámika | d. ideólog |
| b. genétika | e. zoólog |
| c. akústika | f. etnólog |

I propose that the above words are lexically prespecified with an accent. Even though it is not known to me how complex Russian speakers consider these words, it is definite that morphological structure plays some role in the position of stress. In compounds, for example, stress is on the synthetic vowel /-o-/. However, words like *dialóg* ‘dialogue’ and *prológ* ‘prologue’ are stressed on another syllable simply because they are not compounds. We assert, that the ‘deviant’ prosodic pattern of the words in (74) is at least consistent. All Greek words of this form are stressed alike. Clearly, the position of the mark denotes the stress pattern that has been assigned to these forms by the language of origin.

There are more ‘exceptional’ $\sigma+F+\sigma$ patterns. A handful of loan words lack templatic prosodic structure, e.g. *xarákter-y* ‘character-NOM.pl’, *parláment-am* ‘parliament-DAT.pl’, and so on. Loan words often comply to word-binarity, e.g. (*bale*)(*rína*), (*doku*)(*méntam*), (*instru*)(*méntam*), (*limo*) (*nádam*).

Interestingly, there are no loan words marked on the initial syllable. This characteristic in combination with the fact that a number of prosodic re-adjustments have been documented in the history of loan words, show that HIERAL and ALIGN-R gradually took charge of accentuation. Let us have a look at the examples in (75). The form in the left column gives the synchronic prosodic shape of the word, whereas the form(s) in the right column present stages of its history. The examples are taken from Kiparsky (1962).

(75)	<i>present form</i>	<i>past form</i>	
	a. magazín	magázin ³⁰	‘magazine, shop’
	b. patrontáš	patrónťaš	‘ammunition belt’
	c. instrumént	instrúment	‘instrument’

When assimilation started, a shift of accent to the rightmost edge of the word took place. In (75) the accent shifted to a position that ensures the prosodic wellformedness of the word. Thus, the non-templatic *ma(gázin)-y* and *pa(trónťa)š-i* have been reformed to the templatic *(maga)(zín-y)* and *(patron)(táš-i)*, respectively.

As in Greek, I assume that loan words in Russian occupy peripheral strata in grammar. Shifts like the ones exhibited by the examples in (75) clearly indicate that when the foreign form penetrates into the core grammar, the lexical mark is displaced from its original position to create a more agreeable prosodic structure.

The non-templatic form originates from a hierarchy that gives top-ranking to faithfulness to the lexical accent of the foreign form and its position. Thus, FAITH(HEAD), *FLOP >> HIERAL. However, when the form is reconstructed according to the prosodic principles of the host language, *FLOP is degraded to a rank below HIERAL. The tableaux in (76) and (77) illustrate the procedure of prosodic assimilation.

(76) *ranking of prosodic pre-assimilation (peripheral stratum)*

<i>input: ma(gazin-, -y</i>	FAITH(HEAD)	*FLOP	HIERAL
☞ a. ma(gázi)ny			*
b. (maga)(zíny)		*!	

The second candidate in (76) loses over the first one because it violates *FLOP; the lexical accent is realized in another vocalic peak in the output than the one it is affiliated with the input. In the next tableau, on the other hand, HIERAL must dominate *FLOP compelling abandonment of candidate (77c), the previous winner, in favor of (77a).

³⁰ The question still is what explains the stress pattern of the past forms. It seems that some of the loan words have final stress in the language of origin but they are recorded with penultimate stress. A possible explanation could be that since in Russian the pre-stressed syllable is often heard with greater loudness than the stressed one, the position of primary stress was ambiguous for the new loans and often the pre-stressed syllable was confused with the stressed one. Later when the form started assimilating, stress regularized to an agreeable position for the native grammar.

(77i) *ranking of prosodic assimilation (core grammar)*

<i>input:</i> ma(gazin-, -y	FAITH(HEAD)	HIERAL	*FLOP
☞ a. (maga)(zíny)			*
☞ b. (mága)(ziny)			*
c. ma(gázi)ny		*!	

However, even this ranking does not lead us to the correct result. The first two candidates equally satisfy HIERAL. The system needs a constraint that would cast the candidate with initial stress out of the competition. This constraint is nothing else but ALIGN-R which comes into the scene to ensure the correct result. This is shown in (77ii).

(77ii) *ranking of prosodic assimilation (core grammar)*

<i>input:</i> ma(gazin-, -y	FAITH(HEAD)	HIERAL	*FLOP	ALIGN-R
☞ a. (maga)(zíny)			*	
b. (mága)(ziny)			*	*!
c. ma(gázi)ny		*!		

To sum up, in this section I introduced a type of marking for Russian which is ‘blind’ to prosodic wellformedness principles and characterizes the accentuation of foreign lexical strata. The ‘deviant’ accentual patterns of foreign words were attributed to a periphery-to-core organization of the lexicon. Different degrees of foreignness result from upgrading the constraints of the core grammar over faithfulness to the inherent mark of the lexical item. In (78), I give the ranking for diacritic marking. As is known by now, prosodic faithfulness constraints are united and ranked higher than all other constraints of the system.

(78) *ranking for diacritic marking*

FAITH TO LA & FAITH TO POSITION OF LA >> WORDFORM
 FAITH(HEAD), *FLOP >> HIERAL, ALIGN-R

I complete the analysis of Russian stress in the next section with a brief presentation of stress in other grammatical categories.

3.15. Accentuation of Adjectives and Verbs

Stress in adjectives and verbs can be accounted for along the lines of the analysis already proposed for nouns. In this section, I sketch the accentual patterns in these two categories.

Adjectives in Russian fall into two types: the long form adjectives and the short form adjectives. The former can function as attributes or predicates while the latter have a predicative role. Short form adjectives have the following number and gender agreement markers: *-E* (masc), *-a* (fem), *-o* (neut), *-y* (pl). Some examples are given in (79). These examples are drawn from Melvold (1990:184).

(79) *accentual patterns of short form adjectives*

a.	bogát	bogát-a	bogát-o	bogát-y	‘rich’
b.	zдорóv	zдорov-á	zдорov-ó	zдорov-ý	‘robust’
c.	mólod	molod-á	mólod-o	mólod-y	‘young’

All possible accentual configurations are encountered in short form adjectives. The examples in (79a) and (79b) are composed of marked roots, accented and unaccentable, respectively. The accentual properties of suffixes are hidden. Only when they are conjoined with unmarked roots, is the accentual status of the suffixes revealed. Besides the feminine formative, all other suffixes are unmarked.

Long form adjectives are fully declined; they agree with the noun they qualify in number, gender and case. Two types of stress are found among long form adjectives: stress is fixed either on the root or on the inflection. Some illustrative cases, also taken from Melvold (1990:189), are given in (80).

(80) *accentual patterns in long form adjectives*

a.	bogát-aja (NOM.sg.fem)	bogát-oje (NOM.sg.neuter)
	bogát-yj (NOM.sg.masc)	bogát-yje (NOM.pl)
b.	blázn-ája (NOM.sg.fem)	blázn-óje (NOM.sg.neut) ³¹
	blázn-ój (NOM.sg.masc)	blázn-ýje (NOM.pl)
c.	molod-ája (NOM.sg.fem)	molod-óje (NOM.sg.neut)
	molod-ój (NOM.sg.masc)	molod-ýje (NOM.pl)

Looking at the paradigm with the unmarked root, (80c), we understand why only two out of the three possible patterns are documented in long form

³¹ blázn, -á, -ó ‘capricious’.

adjectives. The inflectional formatives are all bimoraic and hence attract stress from unmarked roots. With unaccentable roots, stress is also on the bimoraic suffix as suggested by the ranking in (69).

According to Levin (1978) there are thousands of adjectives with fixed stress on the root. On the other hand, the number of adjectives with unmarked roots comes up to a third. Strikingly, there are only ten adjectives with unaccentable roots. The largest part of the adjectival vocabulary prefers to have a lexical accent on some syllable of the root. The desire for root stress is emphasized by the phenomenon of stress retraction that has been shortly reviewed in nominal accentuation.

Often adjectives that share the same stress pattern in the short form exhibit different stress patterns in the long form. More specifically, there are approximately thirty adjectives which shift stress from the ending to the last syllable of the root. They all consist of unaccentable roots. An example is presented in (81a). In the same morphological context, another alternation takes place; over two hundred unmarked roots convert to accented, (81b). Finally, there are somewhat more idiosyncratic patterns given in (81c). According to Levin (1978) there are 19 examples of this type, all of which consist of roots that are one or two syllables long. As mentioned earlier, special attention to accentual allomorphy is given in Chapter 4.

(81)	<i>accentual allomorphy in adjectives</i>		
	<u>short form</u>	<u>long form</u>	
	a. svež-á, -ó	svěž-ij, -aja, -oje	‘fresh’
	b. dolg-á, dól-g-o	dól-g-ij, -aja, -oje	‘long’
	c. vesel-á, vé-sel-y & vesel-ý	ves’ól-yj, -aja, -oje	‘merry’

The Russian verb has much simpler morphological structure than the Greek verb. Before examining the stress paradigms, I would like first to familiarize the reader with the morphology of verbal formations. Verbs in Russian consist simply of a root and an inflection. These are traditionally referred as ‘athematic’ verbs. We will be looking at two tenses: present and past. Both tense inflections consist of a tense suffix and an agreement suffix. In the present tense, the agreement suffix represents person and number, while in the past tense it represents gender and number. Moreover, the agreement suffixes of the past are identical to those in the short form adjectives. For example, the past form of *lézt* ‘to climb’ is *léz* (masc), *lézla* (fem), *lézlo* (neut), *lézli* (pl). Athematic verbs exhibit the same three stress patterns as inflected nouns and adjectives. Some examples, taken from Melvold (1990:81-82) are listed in (82).

- (82) *accentual patterns in athematic verbs*
- | | | |
|----|-----------------------|-----------------|
| a. | léz-u, -eš, -et | ‘to climb-PRES’ |
| | léz, -la, -lo, -li | ‘to climb-PAST’ |
| b. | pek-ú, peč’-óš, -ót | ‘to bake-PRES’ |
| | pék, -lá, -ló, -lí | ‘to bake-PAST’ |
| c. | živ-ú, živ’-óš, -ót | ‘to live-PRES’ |
| | žil, žilá, žilo, žili | ‘to live-PAST’ |

Verbs like (82a) have fixed stress on the root throughout the paradigm suggesting that the root is accented. Unaccentable roots as in (82b) are responsible for invariable final stress. Finally, alternating stress as in (82c) is triggered by the unmarked accentual status of the root. However, a small number of verbal roots which present themselves as unmarked in the formation of the present tense change to accented in the past tense, (83).

- (83) *accentual allomorphy in verbs*
- | | | |
|----|-------------------------|-----------------|
| a. | strig-ú, striž’-óš, -ót | ‘to shear-PRES’ |
| b. | stríg, -la, -lo, -li | ‘to shear-PAST’ |

3.16. Assessment and Conclusions of Russian Accentuation

Russian stress in inflectional morphology is parallel in many respects to Greek stress. There is a disparity between unmarked and marked words here as well. The former have fixed initial stress and mobile paradigm, whereas the latter have columnar stress, ideal (strictly binary) prosodic shape but variable accentual patterns across the vocabulary.

Starting from unmarked patterns, we have seen that default stress is on the leftmost syllable. In previous analyses (Van der Hulst 1996), the edgemostness of default clause was put forth as an argument for the absence of feet in the language. Here, I claim that vowel reduction, secondary stress and other phenomena indicate a trochaic organization of the language. Initial stress results from EDGEMOST-L, a constraint that is also responsible for secondary stress.

In marked words, lexical contrasts are restricted by HIERAL, a word-form constraint that promotes maximally binary prosodic structures. More specifically, two faithfulness constraints are distinguished: faithfulness to the lexical accent and faithfulness to the lexically prespecified position of the accent. The former is undominated but the latter is dominated by HIERAL. This domination order results into marked words of ideal prosodic shape.

There is a second split in faithfulness. The accentuation of unaccentable roots

and accented suffixes as well as the accentual behavior of bimoraic suffixes suggest that faithfulness to the lexical accent of the root is considered more important than faithfulness to the lexical accent of the inflectional suffix. In Chapter 4 I show that the ranking $\text{FAITH}_R \gg \text{FAITH}_{\text{InflS}}$ is the predecessor of a nuclear ranking for lexical accent systems, namely $\text{HEADFAITH} \gg \text{FAITH}$. An immediate result of this split in prosodic faithfulness is that wellformedness holds for accents stemming from the root but not for accents stemming from the inflectional suffix. A suffixal accent cannot impose itself on the root for the sake of binarity. Consequently, only accents sponsored by the root lead to binary prosodic structures.

On the other hand, lexical contrasts are also restricted in suffixes. The marked/unmarked opposition is displayed only by monomoraic suffixes. This is because a structural constraint that assigns stress to bimoraic suffixes ($\text{SUFFIX}=\text{SMW} > \text{ALIGN-L}$) dominates $\text{FAITH}_{\text{InflS}}$. But even from this already restricted marked set, only accented suffixes show their effects. Pre-accenting suffixes are neutralized by the default.

Finally, Russian evidences that a language with marking can have ‘exceptional’ stress. Stress in loan words is not restricted by wellformedness principles or other structural constraints until the process of assimilation starts. Only when the form reaches the core grammar, lexical accents follow the same accentual principles as the accents of the native vocabulary.

We understand from the above that Greek and Russian diverge in their rhythmic properties but come very close in marking. Both languages employ prosodic principles to limit the arbitrariness in the distribution of lexical accents. Russian appears to be more effective because it allows only one marking pattern for inflectional suffixes.

In the final section of this chapter, I summarize the main properties of marking in Greek and Russian and give an overview of the similarities and differences between the two languages.

3.17. Summary and Conclusions of Chapter 3

This chapter concentrates on the prosodic aspect of lexical marking and more specifically, its interaction with prosodic form and other structural constraints. Two main points are made. First, marking in lexical accent systems is not tantamount to exceptional stress. Second, languages with lexical accents have unpredictable stress but predictable prosodic shape. Lexical marking in Greek and Russian is restricted by wellformedness and other prosodic constraints. Moreover, marked words in these languages compensate for their variable stress

by having fixed paradigmatic stress and invariable prosodic structure. The last two characteristics are missing from accentless words. A more general conclusion that can be drawn from the examination of the accentual facts presented here is that Greek and Russian operate in parallel ways with respect to lexical marking but they diverge in rhythmic aspects such as default accentuation and secondary prominence.

First, there is a split in faithfulness constraints. Faithfulness to the position of the lexical accent, namely *FLOP, is dominated by hierarchical alignment (HIERAL), a word-form constraint that aims at structures with strictly binary prosodic shape. The ranking HIERAL >> *FLOP restricts marks in positions which guarantee that the output word will have a templatic shape, [σ +F], [F+ σ], [F+F]. This is why this type of marking is called templatic.

- (84) *templatic marking in Greek and Russian*
 FAITH TO LA >> WORDFORM >> FAITH TO POSITION OF LA
 FAITH(HEAD) >> HIERAL >> *FLOP

A welcome result from the view taken in this chapter is that we don't need to stipulate restrictions on input representations because restricted marking arises from constraint ranking. Moreover, the fact that this ranking is shared by two unrelated languages shows that lexical accent systems find common ways to limit the distribution of lexical accents. If marked words cannot have invariable stress, they must at least have invariable prosodic shape.

Second, the two languages display a second split in faithfulness constraints. Obeying faithfulness to the root is more crucial than obeying faithfulness to the inflectional suffix. This is supported by the accentuation of words with unaccentable roots and words with unmarked roots and accented suffixes. All these cases show that a lexical accent introduced by a root freely emigrates to an inflectional suffix but not the other way round. Russian provides extra support for the dichotomy in faithfulness. Suffix-faithfulness is dominated by a structural constraint that assigns prominence to all bimoraic suffixes. Consequently, words composed of unmarked roots and bimoraic suffixes are never stressed by default on the initial syllable. Root-faithfulness, on the other hand, is immune to this constraint. Accented roots attract stress from bimoraic suffixes. Evidently, root-faithfulness occupies a higher rank. In (85), I summarize the rankings that show bifurcation in faithfulness.

- (85) *root-faithfulness >> InFLS-faithfulness in Greek and Russian*
 a. unaccentable root + unmarked inflectional suffix
 FAITH(HEAD)_R >> *DOMAIN >> FAITH(HEAD)_{InFLS}

- b. unmarked root + accented inflectional suffix
 FAITH(HEAD)_R >> HIERAL >> FAITH(HEAD)_{Infls}
- c. accented root + bimoraic inflectional suffix
 FAITH(HEAD)_R >> Suffix=SMW>ALIGN-L >> FAITH(HEAD)_{Infls}

Third, structural constraints often bring to light marked patterns that wouldn't have been able to manifest themselves otherwise. ER-R in Greek highlights suffixes marked for tailness. The foot-tail imposes a specific pattern of parsing, $\sigma\sigma\sigma\text{-}\sigma$ > $(\sigma\sigma)(\acute{\sigma}\sigma)$ instead of the default $\sigma(\acute{\sigma}\sigma)\sigma$. By giving prominence to the rightmost foot, stress lies on the syllable preceding the suffix, creating the impression of preaccentuation. The lack of a similar structural constraint in Russian conceals the effects of preaccentuation. This is not accidental of course. Preaccentuation is a form of marking that presupposes cooperation between structural and faithfulness constraints.

- (86) *preaccentuation in Greek*
 ER-R >> FAITH(TAIL) >> FTBIN, PARSE- σ

Finally, the two languages behave alike in the assimilation of exceptional stress patterns which are primarily attested in loan words. The degree of foreignness is determined by the ranking of structural and prosodic wellformedness constraints with respect to faithfulness to the inherent accent and its position.

- (87) *diacritic marking in Greek and Russian*
 FAITH TO LA & ITS POSITION >> WORDFORM, FOOTFORM
Greek FAITH(HEAD), *FLOP >> ER-R, HIERAL, ...
Russian FAITH(HEAD), *FLOP >> HIERAL, ALIGN-R, ...

An important difference between the two languages is that Russian has default stress on the initial syllable (due to EDGEMOST-L), whereas Greek has default stress on the antepenultimate syllable. In addition, Greek is a system that restricts stress to the last three syllabic positions of the word. Primary stress is determined by an end-rule that assigns prominence to the rightmost foot of the word, irrespective of whether it is marked or not.

Before closing this chapter a last remark needs to be made. One may wonder what explains the dynamic presence of marking in such systems or whether it can be plausible for default to elbow marking and take charge of accentuation. These and similar questions pertain to essential issues of lexical accent systems.

Based on the evidence exposed here it seems that marking has a well-founded logic. More importantly, in Chapter 4 I show that marking has a specific purpose in these systems: it is the tool to reflect morphological structure in prosody. To conclude, marked words exhibit properties that often puts them in a better position than default.

Appendix: Evidence for Exhaustive Parsing in Russian

1. The facts

In this study, Russian is analyzed as a trochaic system as opposed to other analyses that advocate an iambic organization of stress in the language. This chapter presents some arguments in support of the trochaicity of the system. Many aspects of the present discussion hinge on a very common, although controversial, subject of Russian phonology: the reduction of unstressed vowels. This phenomenon has been used in a number of studies (Jones and Ward 1969, Alderete 1995) as an argument for the iambicity of the language. Therefore, I would like here to establish that first, vowel reduction advocates a trochaic and not an iambic organization of stress in Russian and second, it provides evidence for the existence of feet other than the primary stressed one.

In Russian, vowels in unstressed positions are not pronounced the same as vowels in stressed positions. More specifically, the length of vowels varies depending on whether the vowel belongs to an accented syllable, a syllable immediately before the stressed one or a syllable in post-stressed or pre-pre-stressed position. Stressed vowels remain qualitatively intact and most often show a considerable degree of phonetic lengthening. On the other hand, vowels in unstressed positions reduce.

There are two degrees of reduction depending first, on the distance of an unstressed vowel from the stressed one and second, on the position (i.e. preceding or following) an unstressed vowel occupies in relation to the stressed one. More specifically, low and mid vowels, /a, o, e/, immediately preceding the stressed vowel undergo the first degree of reduction; /a/ and /o/ reduce to [ʌ] and /e/ to [i]. The difference between stressed high vowels, /i, u/, and their unstressed correlates is minimal. However, in pre-pre-stressed positions the reduction is more dramatic. All vowels reduce to a schwa. The examples in (1) help us visualize the two degrees of vowel reduction. For the sake of clarity only the relevant part of the word is phonetically transcribed. The data are primarily taken from Kenman (1975).

(1) *vowel reduction*

a. stressed

/a/	/o/	/e/	/i/	/u/
vod[á]	st[ó]l	fon[é]ma	kip[í]t	[ú]gol
‘water’	‘table’	‘phoneme’	‘it boils’	‘corner’

b. pre-stressed

t[Λ]kím	v[Λ]dá	l[i]žít	k[i]pít	[u]rók
‘such’	‘water’	‘lies’	‘it boils’	‘lesson’

c. pre-pre-stressed

p[ə]roxód	v[ə]dovóz	s[ə]konómit’	c[i]vilizácija	l’[u]dojéd
‘steamer’	‘water-man’	‘economize’	‘civilization’	‘cannibal’

Based on the fact that pre-stressed vowels are less reduced and, consequently, longer than vowels in other unstressed positions, Jones and Ward (1969), among others, draw the conclusion that the pre-stressed syllable is itself a host of secondary stress: *vodòvóz* ‘water-man’. This proposal implies, however, a quite odd metrical analysis. Polysyllabic words have audible secondary stress on the initial syllable, e.g. *fòtografjúra*. According to their proposal the pre-stressed position has a secondary stress as well but this stress being in a clash, is not phonetically realized. In other words, the metrical configuration for the aforementioned example is: (*fò*)(*togrà*)(*vjúra*). Monosyllabic feet are permitted. However, if secondary feet are iambic, the question is why even longer words such as *zàpatentovát’* ‘to hold a patent’ have secondary stress on the initial and not the peninitial syllable, e.g. (*zapà*)(*tentò*)(*vát’*), as expected?

Kenman (1975) views the two-degree reduction as a transition from a non-stressed to a stressed element. The closer to the stressed vowel, the more complete a vowel is. Unstressed vowels are naturally shorter than stressed ones and hence only a part of the set of elements they consist of can be pronounced in time. This proposal is phonetically correct and relates in many respects to the analysis that is proposed in this study; pre-stressed positions have a special affiliation with the stressed ones.

Alderete (1995) argues that ternary patterns of vowel reduction imply an iambic analysis of the stress foot in Russian, e.g. *vo(dovóz)* ‘water-man’, *pa(roxód)* ‘steamer’. This way different domains of reduction are created. Vowels under stress, i.e. foot-heads, must retain their features intact. Mid vowels, however, are not permitted within the foot domain, therefore the mid vowel /o/ lowers to [a]³² when it is in the weak position of a foot. This means that often within the foot the mid/non-mid opposition reflects the head/non-head opposition, e.g. *pa(r[a]xód)*. Vowels outside the domain of the iambic foot are less protected. They are subject to structural constraints that forbid the

³² According to my sources (Shapiro (1968), Jones and Ward (1969), Kenman (1975)) /o/ reduces to [Λ] and not to [a]. In the analysis that follows, I assume the same.

realization of both [mid] and [low] features compelling total reduction of vowel contrasts outside the foot, e.g. $v[\text{ə}]$ (dovóz), $p[\text{ə}]$ (roxód). I present here a somewhat simplified version of Alderete's analysis of vowel reduction. The reader can consult the source where a constraint-based analysis of the description presented here is given. However, even from this short presentation of the analysis, some unwelcome side effects can be pointed out.

First, iambic languages show a strong tendency to maximize length contrasts within the foot. It is very often the case that the vowel in head position lengthens, or the vowel in a dependent position is deleted or reduced to a maximum. Revithiadou and Van de Vijver (1997) explain this phenomenon as the joint effect of two lengthening forces in languages: first, there is lengthening of stressed syllables (and reduction of unstressed ones); second, a lengthening process targets constituent-final elements such as syllables on final foot positions. Consequently, in iambic feet the stressed syllable is doubly lengthened because it is both stressed and foot-final. On the contrary, the dependent part of the foot has no extra length and, thus, it appears to be much more reduced.³³ It is, therefore, unusual that in Russian the maximum degree of length contrasts arise from a head vowel and an unparsed one and not from the constituents within the foot, i.e. the head and the non-head. Moreover, it could also be more natural to assume that constituents outside the foot domain that are parsed by a higher prosodic constituent must remain more intact compared to non-heads; the latter are licensed directly by the prosodic word which does not enforce any reduction processes in order to maximize length contrasts among its constituents (Kager 1989).

Second, the analysis abstracts away from the footing of disyllabic words with initial stress, e.g. *górod* [górət] 'town'. Here vowel reduction forces degenerate footing, (*gó*)*rod*. For the same purpose, the trisyllabic word *krásnaja* [krásnəjə]

³³ According to Revithiadou and Van de Vijver (1997), trochaic syllables lack sharp length contrasts because the lengthening dynamics within the foot are more balanced. The stressed syllable of a trochee lengthens and, as it is natural, the unstressed one reduces. However, the length of the unstressed element that lies on foot-final position is recuperated by the extra lengthening force that affects constituent-final elements. The joint effects of stress- and final-lengthening are pictured as follows:

	(σσ)	(σσ)
stress-lengthening	↑↓	↓↑
final-lengthening	↑	↑

This schema explains linguistically why there is a drift towards equal length in trochees and a drift towards uneven length in iambs.

'red-NOM.sg.fem' must be parsed as (*krá*)*snaja* leaving two stray syllables. Obviously, such an analysis makes extensive use of monosyllabic feet and it is, therefore, not preferred. According to the analysis proposed here, monosyllabic feet result from faithfulness constraints (and their interaction with other factors) and not from purely rhythmic factors.

As mentioned earlier, there are indications for the trochaicity of Russian external to vowel reduction (i.e. the directionality of stress shifts, secondary stress, fast speech reductions, etc.). I should be emphasized that reduction does not contradict trochaicity. On the contrary, I show that it provides evidence for the exhaustivity of footing.

The first piece of evidence in this direction comes from intonational phenomena. Odé (1989) argues that pitch movements in pre-stressed syllables affect the perception of stress. Often pre-stressed and stressed syllables must be considered together as 'one perceptually relevant unit'. There is a rising pitch movement in the pre-stressed syllable which is followed by a fall when the vowel onset of the stressed syllable is reached. The rising and falling pitch situated in the pre-stressed and stressed syllable aims at enhancing the saliency of the stressed syllable. The figure in (2) depicts a falling movement.

(2) *a rising-falling movement in 'varényimi' (Odé 1989:35)*

The accented syllable in *varényimi* 'boiled' is slightly higher than the pre-stressed syllable, yet a rising movement is perceived: pitch falls immediately after the accent and the pre-stressed syllable is realized at higher level. The falling movement is completed at the end of the word.

We conclude, that there is a special bond between the pre-stressed and stressed position. Based on this conclusion, one can further argue that the lesser degree of reduction in the pre-stressed position is owed to the rising-falling pitch that is associated with the accented syllable. A rising pitch needs time in order to be perceptually realized and this implies that the pre-stressed vowel that carries the pitch requires more vocalic content in order to fulfill this task. So, in order to be able to carry over the rising part of the pitch that accompanies the

stressed syllable, the pre-stressed syllable needs to expand in time. In short, pitch protects pre-stressed vowels from total reduction. Since this issue relates to aspects of Russian accentuation that are not in focus here, pre-stressed vowels are not accounted for, neither they are evaluated in the tableaux that follow.

The examples in (3), mainly collected from Kenman (1975) and also from personal research, shed some more light on vowel reduction. Mid and low vowels, /a, o, e/, in pre-pre-stressed closed (CVC) syllables never exhibit the maximum degree of reduction; the vowels /a, o/ always reduce to [ʌ], as exemplified in (3a-c). Moreover, the examples in (3d-e) demonstrate that the front vowel /e/ raises to [i] in closed syllables (and under secondary stress, e.g. *r[i]vol'uciónnyj*, as shown later).

- (3) *vowel reduction in CVC syllables*
- | | | | |
|----|---------------|--------------------|------------------|
| a. | s advokátom | s[ʌ]dvok[á]tom | ‘with solicitor’ |
| b. | v afganistáne | v[ʌ]fg[ə]nist[á]ne | ‘in Afghanistan’ |
| c. | podzyvát’ | p[ʌ]dzyv[á]t’ | ‘to call up’ |
| d. | bednotá | b[i]dnot[á] | ‘the poor’ |
| e. | predlagát’ | pr[i]dlag[á]t’ | ‘to propose’ |

Interestingly, in post-stressed positions reduction is uniform: all vowels of both open and closed syllables reduce to [ə]. Check the examples in (4). The domain of reduction is a closed syllable. However, the closed syllable in the leftmost column is in word initial position, whereas the closed syllable in the rightmost column it is in medial or final position.

- (4) *reduction in pre-pre-stressed and post-stressed positions*
- | | <u>pre-pre-stressed</u> | <u>post-stressed</u> | |
|----|-------------------------------|----------------------|-------------|
| a. | /a/: s[ʌ]dvokátami (INSTR.pl) | sadvokát[ə]mi | ‘solicitor’ |
| b. | /o/: p[ʌ]dzyvát’ ‘to call up’ | úg[ə]l | ‘corner’ |
| c. | /e/: b[i]dnotá ‘the poor’ | výš[ə]dšij | ‘went out’ |

Looking at the forms in (4) a natural question is borne: why is reduction more dramatic in final (post-stressed) positions? The facts in (4) suggest a more extreme degree of reduction that unveils itself in environments with enough material to support an extra level of reduction. Closed syllables constitute such environments. How can this discrepancy be explained?

I assume that all the above facts point to the existence of secondary (trochaic) feet in the language. These feet are easy to detect only when the word contains

closed syllables. Take as an example the word *s advokátom* s[ʌ]d.vo.k[á].t[ə]m., (4a). In this word there are two closed syllables and one open one. They are all reduced, even though the first (closed) syllable reduces to a lesser extent. The reason is that the featural specification of this syllable is protected by its prosodic role in the structure. This syllable is the head of a secondary foot, (*sadvo*)(*kátom*). Being a head implies that it can bear a greater amount of complexity compared to non-heads.³⁴ This explains the further reduction of the final syllable, /tam/, albeit closed. This syllable is not the head of a foot; on the contrary, it lies on a weak position. Inevitably, the reduction is much more dramatic here.

On the other hand, open syllables totally reduce, e.g. g[ə]lov[á] ‘head’ unless they contain a high vowel, e.g. k[i]pít ‘it boils’. Thus, open (CV) syllables are prone to reduction regardless of the prosodic role they have in the structure.

In short, there is a scale of different degrees of reduction. Stressed syllables preserve their entire vocalic material. Closed syllables preserve most part of their vocalic content only when they are the head of the (secondary) foot, otherwise reduce to schwa. Open syllables reduce to all positions unless they contain a high vowel, /i, u/. Note that secondary stress is suppressed under clash and, more specifically, when the two stressed feet are adjacent to each other. The details of the analysis unfold in the following section. The hierarchy of reduction is depicted in (5).

- (5) *hierarchy of reduction*
 CVC, CV̇ > CVC_{foot-head} > Ci, Cu > CVC, CV

2. The analysis

It is clear that stressed syllables retain their segmental material intact. This implies that featural correspondence between input and output material is preserved under stress. In other words, stressed vowels must be identical to their input counterparts. The notion of counterpart is fundamental to the theory of faithfulness proposed in McCarthy and Prince (1995). Faithfulness of input to output is embodied in a set of constraints on correspondent segments. The constraint in (6) involves input-output faithfulness with special reference to stressed positions.

³⁴ Complexity has been a favored subject in linguistic theory (among many others, McCarthy and Prince 1995, Dresher and Van der Hulst 1997).

- (6) STRESS σ -IDENT[γ F] (cf. HEAD-IDENT McCarthy 1995, Alderete 1995)
 Correspondent segments contained in a stressed syllable agree in value for feature F.
 If $\alpha \mathfrak{R} \beta$, and α is [γ F], and α is contained in a stressed syllable, then β is [γ F].

Featural identity is disrupted by markedness constraints³⁵ that cast out /e, o, a/ when they are not supported by primary stress. For simplicity's sake I compile all three featural constraints into one, expressed here as *{a, o, e}. This constraint entails the following three statements:

- (7) *featural markedness constraints*
- a. *{a}: Avoid featural specification [low]
 - b. *{o}: Avoid featural specification [-hi, -lo, +rnd]
 - c. *{e}: Avoid featural specification [-hi, -lo, -rnd]

The constraints in (7), ranked below STRESS σ -IDENT (and above featural identity constraints) enforce reduction of syllables in unstressed positions. However, the lack of reduction in high vowels, /i, u/ (as well as the fact that unstressed /o/ never raises to [u]), indicate that identity to the high feature, IDENT[high], must be ranked relatively higher with respect to the other featural identity constraints, namely IDENT[round] and IDENT[low]. The ranking so far is as follows:

- (8) STRESS σ -IDENT[γ F] >> *{a, e, o} >> IDENT[high] >> IDENT[round], IDENT[low]

The tableau in (9) illustrates the derivation of the word *urók* 'lesson'. The second candidate fatally violates faithfulness to the stressed syllable although it complies with the demands of the markedness constraint *{o} by discarding the roundness of the vowel. The decision between the first and third candidate relies completely on IDENT[high]. The candidate that is faithful to the high feature of the input (9a) prevails over the one that is not (9c).

³⁵ Here the term 'markedness' refers to constraints that evaluate how marked output structures are (Prince and Smolensky 1993).

(9)

<i>input:</i> urók	STRESS σ -IDENT	*{o}	IDENT[high]
a. urók		*	
b. urák	*!		
c. ərók		*	*!

However, the data in (2) and (3) show that reduction is not uniform. Besides the primary stressed syllable that preserves its segmental material intact, some positions discard less material, whereas some others display total loss of vocalic material. Let us have a closer look at these cases.

Closed syllables display modest reductions when they head secondary feet as in (s[λ]dvo)(kát[ə]m). Examples like this one suggest that closed syllables are prominent within the foot. The prominence behavior of closed syllables is expressed with the constraint in (10) which is based on Prince's (1990) Weight-to-Stress Principle.

- (10) Weight-to-Prominence Principle (cf. Van de Vijver 1998)
 Closed syllables are prominent in foot structure

Closed syllables that are in prominent metrical position resist total loss of their vocalic features and, consequently, preserve more segmental material than unparsed syllables or syllables in foot-dependent positions.³⁶ It is a well-known fact that structural complexity plays an important role in the interrelation between vowel reduction and prominence in general. The central conclusion here is that (closed) syllables that are heads, demand featural identity with their input counterparts, (11), like the primary stressed syllables.

- (11) HEAD σ -IDENT[γ F] (cf. HEAD-IDENT McCarthy 1995, Alderete 1995)
 Correspondent segments contained in a syllable that is a prosodic head agree in value for feature F.
 If $\alpha \mathfrak{R} \beta$, and α is [γ F], and α is contained in a head syllable, then β is [γ F].

³⁶ Several scholars (among others, Van der Hulst 1984, Van Oostendorp 1995, Redford 1998), argue that 'weak' positions, i.e. non-heads, tend to contain phonological material of 'weak' prominence. 'Weak' are considered to be prosodic positions that include either unstressed or light syllables, or syllables with lax vowels, schwas or empty vocalic positions. On the other hand, elements in 'strong' prosodic roles show an inclination towards having a 'strong', that is, more complex structure. Thus, often the head position of a foot is filled in with stressed, heavy or long syllables, or syllables with at least tense or low vowels.

The crucial difference with stressed syllables lies in the fact that the constraint in (11) that refers to faithfulness of prosodic heads is ranked below the markedness constraints in (7) but above markedness constraint that prohibit any featural specification, *[F].

- (12) *ranking between faithfulness and markedness constraints*
 STRESS σ -IDENT[γ F] >> *{a, o, e} >> WPP, HEAD σ -IDENT[γ F] >> *[F]

As a result of this ranking, /o/ is forced to reduce to [ʌ]. Lowering to [a] is excluded as an option for /o/ by virtue of the dominant status of the markedness constraint *{a} which militates against the emergence of low vowels in general. The same markedness constraint forces the vowel /a/ to give up its low feature and raise to the mid [ʌ]. Similarly, /e/ raises to [i] in strong positions but reduces to [ə] in weak positions. This, combined with the fact that the high vowels /i, u/, are always faithful to their segmental content, suggests that IDENT[high] is ranked lower than HEAD σ -IDENT but higher than other featural identity constraints. However, let us first consider how the ranking system is modeled.

The tableau in (14) exemplifies the derivation of the example *sadvokátom* s[ʌ]dvocat[ə]m]. Two additional points must be taken into consideration. First, parsing of syllables to feet and foot-binarity are important indicating that FTBIN and PARSE- σ occupy a high rank in the system. Second, only closed syllables can inherently attract stress and be prosodic heads. Open syllables are parsed into binary feet but they do not attract stress. We conclude that the ranking in (13) is enriched with two constraints:

- (13) *ranking between faithfulness and markedness constraints*
 STRESS σ -IDENT[γ F] , FTBIN >> PARSE- σ ³⁷ >> *{a, o, e} >> WPP,
 HEAD σ -IDENT[γ F] >> *[F]

³⁷ The ranking between FTBIN and PARSE- σ is established by examples like *šo(kíro)vat'* 'to shock'. This word is pronounced as [šəkírəvət'] suggesting the footing *šo(kíro)vat'*. An opposite parsing would allow monosyllabic feet at the expense of foot binarity, (*šo*)(*kíro*)(*vat'*), implying that the final closed syllable must be less reduced: [šəkírəvət']. This is not empirically correct, however, leading to the conclusion that the ranking between these two constraints is FTBIN >> PARSE.

(14)

<i>input</i> : s advokátom	STRESS σ -IDENT	FTBIN	*{a, o}	WPP	HEAD σ -IDENT	*[F]
a. (s[a]dvo)(k[á]t[ə]m)	*!		a			**
b. (s[a]dvo)(k[á]t[ə]m)			a a!			**
c. (s[ə]dvo)(k[á]t[ə]m)			a		**!	*
d. (s[Λ]dvo)(k[á]t[Λ]m)			a		*	***!
e. (s[Λ]dvo)(k[á]t[ə]m)			a		*	**

The tableau in (14) is read as follows: Candidate (14a) fatally violates STRESS σ -IDENT. Candidate (14b) crucially violates the markedness constraint *{a}; not only the stressed syllable but also the heavy one has a full (low) vowel. The third candidate, (14c), is mainly excluded because the first closed syllable does not preserve any vocalic material.³⁸ The fourth candidate, (14d), has more vocalic content than it should: it preserves material in the closed syllable-head and material in the closed syllable that is not a head. The last candidate (14e) wins because it best satisfies the constraints.

HEAD σ -IDENT is also decisive for the two candidates in (15). In the first candidate (15a), the closed syllable-head preserves more material than the second one (15b) which deletes all feature values.

(15)

<i>input</i> : bednotá	*{e}	HEAD σ -IDENT	IDENT[high]
a. (b[i]dno)(tá)		*	*
b. (b[ə]dno)(tá)		**!	

IDENT[high] is ranked above markedness constraints that prohibit any feature specification, *[F]. This is shown by the following two tableaux. The candidate that respects the high feature is deemed optimal.

³⁸ In this tableau violations of HEAD σ -IDENT and *[F] are reckoned in a gradual and not in an absolute way.

(16)

<i>input:</i> podzyvát'	IDENT[high]	*[F]
☞ a. (podz[i])(vát')		*
b. (podz[ə])(vát')	*!	

<i>input:</i> civilizácija	IDENT[high]	*[F]
☞ a. (c[i]vi)li(záci)ja		*
b. (c[ə]vi)li(záci)ja	*!	

For words with no closed syllables the WPP and HEAD σ -IDENT constraint are inert and the decision relies completely on markedness constraints.

(17)

<i>input:</i> golová	*[F]
a. (g[Λ]l[ə])(vá)	**!
☞ b. (g[ə]l[ə])(vá)	*

Loginova (1995) claims that a rhythmic stress rule is active in Russian polysyllabic words. This rule is accompanied by a qualitative vowel reduction and it is expressed by prolongation and slight lengthening of the prominent syllable. Some of the examples she includes in her paper are given in (18).

(18) *secondary stress in Russian*

- a. r[í]vol'ucióunnyj /revol'ucionnyj/ 'revolutionary'
 b. z[λ]patentovát' /zapatentovat'/ 'to hold a patent'

It seems that secondary stress emerges only in a non-clash environment, e.g. (*rèvo*)l'*u*(*cióunnyj*) where a syllable intervenes between the two feet. On the other hand, secondary stress is suppressed under clash as, for example in (*golo*)(*vá*). This implies that the constraint CLASH (Kager 1994b), which prohibits adjacent stressed feet, must be ranked above EDGEMOST-L (Prince 1983). As we have seen, this constraint assigns a peak on the leftmost syllable of the word.³⁹ Thus, it is not surprising that the effects of EDGEMOST were hidden in the examples we examined. In fact, the constraint is ranked higher than some other constraints we have reviewed, as the tableau in (19) shows.

³⁹ Note that the same constraint is responsible for default initial stress in the absence of lexical accents.

However, its crucial domination by CLASH reveals its effects only in very long words. Let us have a look at the following tableau:

(19)

<i>input</i> : revol'ucionnyj	CLASH	ER-L	*{e}	HEADσ-IDENT	IDENT [high]
☞ a. (r[i]vo)l'u(ciónnyj)				*	*
b. (r[ə]vo)l'u(ciónnyj)		*!			

The first candidate in (19) is the winner because it best satisfies the constraints compared to the others. Candidate (19b) violates ER-L and hence is doomed to fail.

In conclusion, although somewhat hidden, there are some convincing arguments that support the assumption that parsing in Russian is exhaustive. (20) summarizes the ranking that accounts for exhaustive parsing and vowel reduction in Russian.

(20)

ranking for exhaustive parsing and vowel reduction

