2 The Theory of Lexical Accents

2.1. Introduction

This chapter develops a theory for the lexical specification of morphemes. Underlying metrical information is given the name 'lexical accent' or just 'mark'.[1] In this thesis I argue that a lexical accent is an autosegmental feature that does not provide any clues about its phonetic manifestation. A lexical accent is liable to the demands of the phonological constraints of the grammar and, if qualified, it will be phonetically assigned duration, pitch and intensity.

This chapter starts with an outline of the theory of marking. Based on empirical evidence, I establish that it is better to view lexical accents as autosegmental features and not as prosodic roles (McCarthy and Prince 1995, McCarthy 1995, 1997). I further propose that the mapping between lexical accents and the vocalic peaks that sponsor them is established in terms of universal constraints and, more specifically, in terms of faithfulness constraints.

The chapter continues with a brief review of other approaches on marking. There is little consensus in the literature on the nature of lexical stress. Three mainstream theories of lexical specification are examined. First, there are theories that argue that the mark is a prosodic constituent that is assigned to a morpheme in the lexicon. Two approaches are examined, Inkelas's (1994) theory of exceptional stress in Turkish and Alderete's (1997) theory of lexical

[1] The terms 'mark', 'marking' and 'markedness' in this thesis refer to the lexical accent and the property of some morphemes to have accents in their lexical representation. This use of the terminology should not be confused with the role that markedness theory plays in OT. That is, except for faithfulness constraints, all other constraints evaluate the markedness of the output structures. The mark (*), given in the tableau cells, is not just a typographical symbol, but indicates how 'marked' the structure being evaluated is. One of the main results of OT is that there is no necessity for a separate 'markedness theory of grammar', because OT is itself a markedness theory.

accentuation in Cupeño. Inkelas (1994) argues that lexical marking is encoded as a trochaic foot which is lexically affiliated with a morpheme. Alderete (1997) views marking as pure prominence. Lexical stress is encoded as an intrinsic feature of an underlying sponsor which has no phonetic realization. These two approaches are very similar to the theory of marking advanced in this study.

Second, on what appears to be the standard approach, the lexical accent is also pre-assigned in the lexicon but it is a prosodic constituent such as a head or a syllable boundary which is projected onto the stress plane by an idiosyncratic property of the syllable (Halle and Vergnaud 1987, Idsardi 1992, Halle and Idsardi 1995, Van der Hulst 1996).

Finally, there are theories which advocate that marking is the byproduct of subgrammars. Marked words belong to a subsystem which is governed by its own rules and parameters (Tsay 1990) or word/morpheme-specific constraints (Hammond 1995) or constraint-rankings (Revithiadou 1997a).

This preview roughly reflects the organization of the chapter. In §2.2 I outline the theory of marking advanced in this study. Occasionally, aspects of the theory are clarified by using examples from Greek, Russian and Thompson Salish. In §2.3, I present some other theories of marking. More specifically, in §2.3.1 and §2.3.2, I discuss the basic principles of Inkelas's (1994) and Alderete's (1997) models, respectively. In §2.4, I sketch out the theories that view marking as an inherent property of a syllable. Idsardi's (1992) model is given some extra attention because at first sight it appears to share a few properties with the marking theory adopted here. As I show, the two theories substantially differ. The last section, §2.5, reviews works that treat marked accentual patterns as part of a subgrammar.

Before moving on, a caveat is needed. In most of the models discussed in this chapter, lexical marking is tantamount to 'exceptional stress'. In the Introduction I mentioned that marking in lexical accent systems is a fundamental apparatus of accentuation, the tool for the prosody-morphology interface and not just a mechanism that derives exceptional stress patterns. In Chapter 3, I show that we must make a distinction between two types of marking which have the same representation but different functions. Since marking as a mechanism of underlying metrical representation is uniform, no distinction between types of marking that differ in function is made here.

2.2. The Theory of Lexical Accents

2.2.1. What is a lexical accent?

A lexical accent has an independent status in this study. It is an abstract entity, an autosegment like tone, that it is sponsored by a morpheme but provides no cues about its phonetic manifestation. If the autosegment is included in the prosodic organization of the word, it is assigned a phonetic interpretation, which is stress in a stress-accent language or pitch in a pitch-accent language.[2] As an autosegmental feature a lexical accent can be associated to the sponsoring morpheme or be floating.

Another property of a lexical accent is that it has two valences, it can be 'strong' or 'weak'. A strong accent corresponds to a head and is phonetically realized as stress in languages with dynamic stress or high pitch in pitch-accent languages. In Greek, for example, which is a foot-based language, a strong accent always defines the head position of a foot, σ(σ́σσ. If qualified by the stress rules of the language, it also defines the position of the primary stress of the word, σσ(σ́σ)σ (by rightmost-foot stress). In Thompson, a language that lacks feet, a strong accent defines the possible position of the head of a word, σσ́-σ́ and, indeed, if qualified, it carries primary stress, σσ́-σ.

A weak accent, on the other hand, is an accent that lacks prominence. Two forms of weak accents are distinguished. In foot-based languages like Greek and Hua,[3] a weak accent avoids prominence by being parsed as the weak part of a foot. In other words, it is an accent that takes a dependent position in the

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[2] Languages in which the accented syllable is pronounced with pitch obtrusion, greater duration and intensity are traditionally called 'dynamic stress languages' or 'stress-accent systems'. Languages that mark the accented syllable by a change in pitch are called 'pitch-accent languages'. In the latter systems, tones or tone melodies are lined up with the segmental structure by means of an accent that is present in the lexical representation of the word (Beckman 1986, Van Heuven and Sluijter 1996).

[3] Hua, is a foot-based pitch-accent system (Haiman 1980, Hendriks 1996). Trochaic feet are assigned from left to right. The foot that hosts a lexical accent (ia) and the leftmost foot in the word (ib) are assigned a high tone. The topic marker *-mo* in (ic) is of interest because it induces a high tone to the syllable that precedes it, (ic). This is because the suffix *-mo* is marked to be a foot-tail, thus forcing the word to be parsed as *zuʔ(víʔmo)*, and not as *(zuʔviʔ)*mo*.

(i) a. kenagámo 'a long time ago'
b. hígaʔda 'he did and I...'
c. zuʔvíʔ-mo 'in the house'

metrical structure, namely a foot-tail. In unbounded systems, a weak accent is realized either as low tone or as grave accent. In a pitch-accent system like Fore, for example, a weak accent is always a low tone.[4] In a stress-system like Thompson, a weak accent is just a grave accent, that is an accent that has duration but no loudness. Grave accents in Thompson protect vocalic peaks that bear them from reduction, but they never bear primary or secondary stress themselves. The strong and weak distinction between accents is illustrated with a few examples in the following paragraphs.

Greek is a trochaic system (cf. §3.2). In this language, syllables are parsed into syllabic trochees as indicated by the patterns *kro*(*kóði*)*los* 'crocodile', (*ánθro*)*pos* 'man'. Some inflectional suffixes in Greek such as the genitive singular /-u/ attract stress to the preceding syllable. Take for granted for the moment that the root /anθrop-/ is unmarked. (Full argumentation is provided in Chapter 3.) When this root combines with an unmarked suffix, stress is by default on the antepenultimate syllable (1a). However, with the genitive suffix stress shifts to the penultimate syllable (1b).

(1) *weak lexical accent in Greek*

a.	ánθrop-os	'man-NOM.sg'
b.	anθróp-u	'man-GEN.pl'

The suffix /-u/ creates an 'island' in the word that contains it. When parsing mechanisms apply to metrify the string of syllables, it imposes the restriction that it has to be parsed in a weak position, more specifically, as the dependent of a foot, e.g. (kroko)(ðíl**u)**.[5] It is important to mention that a suffix with a foot-tail specification imposes no claims on the position of the foot-head. Where exactly primary stress falls, is decided by the overall accentual system of the language. In Greek, the effects of weakly marked suffixes are revealed because of a stress

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[4] Fore, another language from New Guinea, is an unbounded pitch-accent system (Nicholson and Nicholson 1962). In this language a strong accent hosts a high tone, (iia), whereas a weak accent hosts a low tone (which spreads to the right), (iib).

(i)	a.	waníne		'water-INDIC'
	b.	aogiwanine	/aogî -waníne/	'(it is) good water'

Other lexical accent systems with tones are Japanese (Haraguchi 1977, 1991, Beckman and Pierrehumbert 1986) and Ancient Greek (Oikonomou 1984).

[5] If the suffix was unmarked the string would have been parsed as *kro*(*koði*)*lu* by the system of default constraints in Greek.

rule that demands the rightmost foot to be the head of the prosodic word (cf. §3.5.3). In Russian, on the other hand, the effects of preaccentuation are concealed because the language has primary stress on the leftmost vocalic peak (cf. §3.13). I use a right foot bracket, ‘)’ or a dot ‘.’ to denote a weak accent in Greek.

Thompson shows that a weak lexical accent surfaces as weak prominence. Some examples of weak accents are listed in (2). Weak prominence is different from secondary stress. Secondary stress is rhythmic, at least in the lexical accent systems examined here, whereas weak prominence is not. Moreover, weak accents are not audible. The criterion to detect a weak lexical accent is vowel reduction. Unstressed vowels in Salish reduce to zero. The only situation in which vowel reduction fails to apply is when a vocalic peak has a grave accent. This accent is phonetically expressed with duration but no loudness. The examples are taken from Thompson and Thompson 1996 (henceforth Th in the examples).

(2) *weak lexical accents in Thompson*

a.	kàwpúy	‘cowboy (English loan)’	(Th 82)
b.	címèɬ	‘be first’	(Th 30)
c.	c’ènéc’	‘bullhead’	(Th 53)
d.	=úsyèp’	‘firewood (LexS)’	(Th 543)
e.	xʷəsə́l’èc	‘tree-fungus’	(Th 522)

In short, the vowels in (2) have an accent that has segmental content but lacks prosodic prominence. I use a grave accent ‘ ̀ ’ or a dot ‘.’ to indicate a weak accent in Salish.

To sum up, morphemes with weak accents are called *weakly accented* because they never bear primary prominence. I also use the term *pre-accenting* to refer to morphemes which have a tail specification.

When the lexical accent is strong, it is realized as a head, *stafíð-*, *-ón*, in Greek and *ƛ̓áq̓ʷ*, *kʷén* in Thompson Salish. In this case the morpheme that sponsors the accent is called *accented*. A strong accent is represented with an asterisk (*). However, for typographic simplicity I also use a left-foot bracket, ‘(’ to represent a strong accent in Greek and an acute accent ‘ ́ ’ to represent a strong accent in Salish. A left or right foot boundary does not have any theoretical weight in this study. It is just a notational convention that helps us visualize a strong and a weak accent in a foot-based language like Greek.

I also adopt a uniform representation by letting ‘σ’ stand for both underlying vocalic peaks and surface syllables, although vocalic peaks are the hosts of

marks in the lexicon but on the surface syllables are. Roots are represented with a hyphen at the right edge, σσ-, and suffixes with a hyphen at the left edge, -σ. The abstract examples in (3) illustrate how marked morphemes are represented in this study.

(3) *marked morphemes*

accented	weakly accented
*	.
|	|
σ	σ

Legenda: The typographic notation for accented morphemes is (σ (for Greek, Russian and Lillooet Salish) and σ́ (for Thompson, Spokane and Moses-Columbia). The typographic notation for weakly accented morphemes is σ) (for Greek and Lillooet) and σ̀ (for Thompson).

As an autosegment, a lexical accent has the possibility to float. The next step will be, therefore, to explore whether there are floating accents. Greek and Russian have post-accenting or else, post-stressing morphemes. This term is used to describe, for instance, roots that locate an accent on the first syllable of the following suffix. An example of postaccentuation is the root /uran-/ in the Greek word *uran-ós* 'sky-NOM.sg'. As shown in (4), stress is on the suffix throughout the paradigm.

(4) *paradigm of uranós* 'sky'

NOM.sg.	uranós	/uran-os/	post-acc root+unmarked suff
GEN.sg	uranú	/uran-u)/	post-acc root+pre-acc suff
ACC.sg.	uranó	/uran-o/	post-acc root+unmarked suff

However, one could cast doubt on this view by arguing that postaccentuation is just an effect imposed by morphological structure. Let us assume that a root like /uran-/ just chooses to boot an inherent lexical accent out of its morphological domain. In other words, the root is just *unaccentable*. Now, if the root prohibits a lexical accent from its domain and provided that all words in a language like Russian or Greek must be stressed on some syllable, then the only physically available host for lexical accent and consequently, stress, is the inflectional suffix /-os/. As expected, the outcome is postaccentuation.

A more telling example comes from the Thompson language of Salish. In this language the default algorithm assigns prominence to the leftmost full vowel,

ɬác-e-s ‘he poultices it’; otherwise, to the rightmost schwa, *s/ƛ̓’eʔk=xəən*[6] ‘footprint’. However, the roots in (5) are never accented despite the fact that they have a full vowel. Instead, stress falls on the following suffix (5a), even when this suffix includes a schwa (5c-d). I argue that these roots are unaccentable.

(5) *unaccentable roots in Thompson*

a.	n/wen-ím-s-es	‘make s.o. get up early’	(Th 373)
b.	meloq’w-e-s-t-és	‘knock s.o. out’	(Th 194)
c.	q^{w}in-əm	‘serve as a spokesman’	(Th 295)
d.	cuwes=xən	‘measure another shoe’	(Th 43)

Under the present proposal we predict that, if the morphological structure is such that an unaccentable root is preceded by a prefix, the resultant word may well be accented on the prefix. Unfortunately, prefixation for the systems I examine here is not very illuminating because most prefixes fall outside the prosodic domain of the word.[7] Moreover, in Russian, prefixation is highly unproductive in nouns and in Greek the three-syllable-window limitation hardly ever permits stress on prefixes. Fortunately, we can test this hypothesis in derived formations.

A derivational suffix in languages with fusional morphology is usually flanked by a root and an inflectional suffix. If our assumptions about unaccentability are correct, then we expect the accent of an unaccentable derivational suffix to link to any position of the word other than the derivational suffix itself, namely the root or the inflectional suffix. This prediction is borne out in Greek.

In Greek, the derivational suffix /-ik-/ is unaccentable. Derivations with this suffix show the following accentual allomorphy: *túrk-ik-os* and *turk-ik-ós* ‘Turkish’. It is evident from these examples that the accent avoids landing on the derivational suffix. At the same time it exploits both permissible positions for stress. I leave aside exactly how accentuation is pursued because it is not relevant at this point of the discussion. What is of importance here is that the morphological make-up of words has an effect on the position of stress when unaccentable morphemes are involved.

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[6] In Thompson and other Salish languages schwa /ə/ becomes an /e/ before a glottal stop /ʔ/.

[7] The asymmetry in the behavior of prefixes and suffixes is attributed in Van Oostendorp (1997) to syllabification. Suffixes often lean to roots in order to obtain the required onset and acquire a well-formed syllabic structure, in contrast with prefixes, which are more autonomous in this respect.

To sum up, the facts we have reviewed show that that there are marked morphemes whose accent is pushed outside their segmental territory. In a way, this accent is free to flop to the right or the left side of a morpheme. The few examples presented here, and more evidence that will be presented later, suggest that an accent that is free to move away from its sponsor must be floating. The lack of association with the source morpheme permits the accent to flop to the left or right edge, as shown in (6). The sign '▽' indicates the possible landing positions of the accent.

(6) *floating accent*

*

▽ -ik- ▽

In the Appendix and in the next section I delve more into the issue of unaccentability. I show that many phenomena in grammar, such as the Kikuyu tone shift, the tone assignment in Chichewa and Sukuma, and so on, show that morphemes, word edges or even prosodic constituents such as feet, often avert association with a tone. In all these cases unaccentability is closely associated with the floating nature of a tone or a lexical accent. An accent or a tone that is not locally linked can, by definition, operate on a wider scope. Only then can it have a global distribution and hence be realized outside the domain of the morpheme that sponsors it.

One could claim that preaccentuation is nothing more than a form of unaccentedness. Inflectional suffixes sponsor a floating accent which lands on the root. This way we need not distinguish between strong and weak accents in languages like Greek. There are several reasons that prevent us from adopting this view. I mention two reasons here and some more in Chapter 3. First, we would need two different devices in order to explain that the floating accent of the suffix /-on/ in *praktóron* /prak$_{R}$-tor$_{DerS}$-on$_{InflS}$/ lands on the final syllable of the stem, whereas the floating accent of the verbal class morpheme /-u-/ in *ðjavázune* /ðjaváz$_{R}$-u-ne$_{InflS}$/ 'read-PRES-3pl.' lands on the final syllable of the root.[8] In the former example, a device that links the lexical accent to the stem is needed, whereas in the latter example, a device that links the accent to the root is needed. If we assume that the suffix has a weak accent, both examples can be uniformly accounted for. Second, there are languages like Hua (cf. fn 3) and

[8] Penultimate stress in the verbal paradigm is triggered by the thematic vowel which indicates verb class and tense, e.g. *ðjaváz-i-s* 'read-PRES-2sg', *ðjaváz-u-me* 'read-PRES-2pl' Verbal roots in Greek lack inherent accentual properties.

Turkish (Inkelas 1994) [9] which both lack unaccentable morphemes but have pre-accenting ones.

We conclude that the difference between a marked accented morpheme and a marked unaccentable one is that the former morpheme is linked to the accent it introduces (7a), whereas the latter is not (7b). On the other hand, an unmarked morpheme is contrasted to both types of marking by lacking an accentual specification (7c).

(7) *accents and morphemes*

	*	.	
	|	|	
a.	σσ-	-σ	*accented*
	*	.	
b.	σσ-	-σ	*unaccentable*
c.	σσ-	-σ	*unmarked*

The representations in (7) raise an important question. If unaccentable morphemes are similar to accented ones, the only difference being that the underlying accent is not linked to a vocalic peak, are there unaccentable morphemes that introduce a weak accent? Unfortunately, this type of marking is not attested in the languages studied in this thesis.[10] This gap, however, relates to another question: how common is it to have morphemes other than inflectional suffixes marked with a weak accent? The empirical facts suggest that it is not very common to have morphemes other than inflectional suffixes marked with a weak accent. If Richness of the Base[11] (Prince and Smolensky 1993) is a fundamental tenet of Optimality Theory, every imaginable lexical

[9] Pre-accenting suffixes in Turkish (Inkelas 1994) such as the suffix /mI/ are also problematic if they are treated as unaccentable. Two devices must be employed to account for the fact that a floating accent lands on the root in *arabá-mɨ* /araba-mI)/ 'car-INTERR' but on the suffix in *araba-lár-mɨ* /araba-lar-mI)/ 'car-pl-INTERR'. An analysis that takes the suffix /-mI/ to bear a tail specification, on the other hand, can account for the Turkish facts in a more economical and efficient way.

[10] There is a suffix with a weak floating accent in Cupeño. I present the relevant example in §2.3.2 and §5.2.4.

[11] Richness of the Base advocates the lack of constraints on the input. Inputs are potentially infinite as the candidate set; the constraints in *Eval* must be ranked in a way that impossible outputs never surface.

representation is possible; the grammar decides which one yields actual surface forms. Thus, there is nothing wrong in employing floating weak accents in underlying representations.

This gap can be understood from the following points of view: First, in the interaction of constraints that refer to lexical accents (faithfulness constraints) with the other constraints of the language. For instance, the window in Greek, that is the restriction of stress to the last three syllables of the word, would hide the effects of a derivational suffix, $-\sigma_i$, that introduces a weak floating accent to a morpheme at the left, $(\sigma\sigma)_{\sigma i}$-$\sigma_i$-$\sigma$. Structural constraints, responsible for parsing syllables to feet and assigning prominence to the rightmost one, cast out the form $(\acute{\sigma}\sigma)(\sigma$-$\sigma)$ because it violates the three-syllable-window. On the other hand, if the floating accent moves to the right, $\sigma\sigma$-$(\sigma_i$-$\sigma)_{\sigma i}$, structural constraints would trigger stress on the preceding constituent, namely the derivational suffix itself, creating the same effect as having an underlying foot-head.[12]

Second, if compositionality and head-dominance indeed require a one-to-one correspondence between prosodic and morphological headedness, then it is justifiable to expect elements that are morphological heads such as roots or derivational suffixes to be marked with a strong lexical accent. This way the head-morpheme guarantees itself a good chance to become the prosodic head of the word as well. On the other hand, it is expected that non-dominant elements such as inflectional suffixes to have 'weak' accents (or no accents).

Third, the disadvantage of a weak accent is that it does not entail a positive statement about the position of the head. As mentioned earlier, prosodic headedness in Greek words like *anθrópu* is determined by the structural constraints that assign primary stress to the rightmost foot of the word. This makes up another reason that justifies why foot-tailness is not such a favorite type of marking.

Before closing this section, it must be noted that unaccentable morphemes in this thesis are given in underlined font. This is only a notational convention in order to make 'unaccentability' visually perceptible. I repeat here that the foot brackets do not have any significant theoretical weight; they are just the visual translations of strong and weak accents. The table in (8) summarizes all types of marking.

[12] The floating accent cannot be realized locally because the suffix is unaccentable. An outcome such as $\sigma(\sigma$-$\sigma)_i$-σ, in which the floating accent is located on the derivational suffix, is ruled out.

(8)

Unmarked	**Marked**	
	Accented	*Unaccentable*
σσ	*strong*: σ(σ, σσ́ *weak*: σ)σ, σσ̀	σσ

To recapitulate, unmarked morphemes lack any inherent metrical organization. Marked accented roots and suffixes have a lexically pre-specified head on some vocalic peaks, depending on the language. As I show in Chapter 3, in some languages the position of a lexical accent in a word is almost predictable. When the marked morphological element forms a word and parsing mechanisms apply to metrify the string, a peak with a strong lexical accent claims stress prominence. A weak lexical accent, on the other hand, never receives primary prominence nor assigns prominence to preceding constituents. As pointed out above, preaccentuation is the byproduct of many factors cooperating towards this direction.

2.2.2. Correspondence Theory and prosodic faithfulness

McCarthy and Prince (1995) claim that *faithfulness* constraints demand that the output be as close as possible to the input. Derivation is determined to a large extent by the interaction between faithfulness constraints, demanding identity, and constraints on output structural configurations. The latter may favor modification of the input, in violation of faithfulness. The Theory of Correspondence is introduced by McCarthy and Prince into OT to define types of constraints on elements that stand in correspondence, giving emphasis to distinct realizations of constraint-types for each domain in which correspondence plays a role. Correspondence is itself a relation between two structures such as an input and an output and is defined as follows:

(9) *Correspondence* (McCarthy and Prince 1995:262)
Given two strings S_1 and S_2, **correspondence** is a relation $\Re$ from the elements of S_1 to those of S_2. Elements $\alpha \in S_1$ and $\beta \in S_2$ are referred to as **correspondents** of one another when $\alpha \Re \beta$.

In a correspondence-sensitive grammar, candidate outputs are subject to evaluation together with the correspondent input. Each candidate pair (S_1 S_2) comes from Gen equipped with a correspondence relation between S_1 and S_2

that expresses the relation between S_1 and S_2. Eval then considers each candidate pair with its associated correspondence relations, assessing the completeness of correspondence in S_1 and S_2. McCarthy and Prince (1995) and McCarthy (1997) argue that the set of correspondent elements that can be referred to by faithfulness constraints is not limited to segments; those elements may include autosegmental features like moras, tones and, by extension, lexical accents.

Our task now is to phrase the relation between the lexical accents in (7) and the morphemes that sponsor them, in terms of universal constraints, with focus on faithfulness. For the representations in (7a), two faithfulness constraints are relevant: first, faithfulness to the lexical accent and second, faithfulness to the position of the lexical accent, that is the association of a lexical accent with the vocalic peak that bears it. I leave aside at the moment the representations with floating accents in (7b) in which the lexical accent is not associated to a vocalic peak.

Faithfulness to correspondent elements is a matter of obedience to constraints like MAX-seg, DEP-seg.[13] With respect to the autosegmental feature of lexical accent, the faithfulness constraints in (10) make direct reference to the lexical accent and account for the fact that in the absence of an overriding constraint, an input representation does not change.

(10) *faithfulness constraints*

a. MAX(LA)
A lexical accent of S_1 (input) has a correspondent in S_2 (output).

b. DEP(LA)
A lexical accent of S_2 (output) has a correspondent in S_1 (input).

Formally, MAX(LA) penalizes the deletion of a lexical accent and DEP(LA) the insertion of a lexical accent.[14] Given the dichotomy into strong and weak lexical accents the faithfulness constraints in (10) can be more specific, namely MAX/DEP(HEAD) and MAX/DEP(TAIL) or MAX/DEP(GRAVE).[15] In short,

[13] In this thesis faithfulness to the vocalic segment that bears the lexical accent is taken for granted. I do not give a more detailed formulation of the relevant faithfulness constraints here.

[14] This refers to situations in which a lexical accent, which is originally sponsored by a root, for instance, is realized on the inflectional suffix in the output.

[15] MAX(HEAD): Every head accent of S_1 has a correspondent in S_2.
DEP(HEAD): Every head accent of S_2 has a correspondent in S_1.

MAX/DEP are prosodic faithfulness constraints that demand faithful-ness to the lexical accent.

As mentioned in Chapter 1, another family of faithfulness constraints is of importance in this study, namely the head-faithfulness constraints. These are faithfulness constraints to accents that belong to morphological heads. HEADFAITH constraints militate against the deletion or insertion of a lexical accent that belongs to a head:

(11) *head-faithfulness constraints*

a. HEADMAX(LA)
A lexical accent sponsored by a head in S_1 (input) has a correspondent in S_2 (output).

b. HEADDEP(LA)
A lexical accent hosted by a head in S_2 (output) has a correspondent in S_1 (input).

These constraints become important when there is competition among lexical accents for primary stress. Chapters 4 and 5 illustrate how HEADFAITH constraints operate in lexical accent systems.

Input autosegmental associations between segments and lexical accents in a representation like (7a) are enforced in the output by a constraint that demands conservation of these associations. This constraint is *FLOP (McCarthy 1997, Alderete 1997):

(12) *FLOP (LA)
Let χ_i be a lexical accent, ζ_j be a vocalic peak, S_k phonological representations
$S_1 \Re S_2$,
χ_1 and $\zeta_1 \in S_1$, χ_2 and $\zeta_2 \in S_2$,
$\chi_1 \Re \chi_2$ and $\zeta_1 \Re \zeta_2$,
if χ_1 is associated with ζ_1, then χ_2 is associated with ζ_2.

As defined in (12), *FLOP is a prosodic faithfulness constraint that demands lexical accents to remain faithful to their lexical association. In general, *FLOP belongs to a family of constraints that militate against deletion or movement of

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MAX(TAIL/GRAVE): Every tail/grave accent of S_1 has a correspondent in S_2.
DEP(TAIL/GRAVE): Every tail/grave accent of S_2 has a correspondent in S_1.

association lines in other kinds of autosegmental association such as tone or segmental features.

The question now is how unaccentable morphemes score with respect to the aforementioned constraints. And, more importantly, what triggers the realization of a lexical accent outside the morpheme that sponsors it.

The morphemes in (7b) introduce a lexical accent and, consequently, are subject to prosodic faithfulness. *FLOP, however, seems to be irrelevant here simply because the lexical accent is not underlyingly fixed to any position. But what prohibits the accent from being linked to the morpheme it belongs to?

I claim that the constraint that prevents local realization of floating accents is *DOMAIN. This constraint is based on Carleton and Myers's (1996) *DOMAIN, which is originally proposed to account for the fact that the tones of a certain group of affixes in Chichewa are never realized within their morphological domain (cf. (3) in the Appendix). The *DOMAIN constraint states that a lexical accent should not be associated to the morphological domain that sponsors it:

(13) *DOMAIN: *LA$_\alpha$
|
[...σ ...]$_\alpha$

*DOMAIN expresses the need of accents to globalize, to extend beyond the restricted domain of a morpheme and become a property of the word. This constraint is controlled by *FLOP in lexical accent systems. As a consequence, a linked accent remains fixed to its lexical position.[16] A floating accent, on the other hand, is not subject to such a restriction; consequently, it can accomplish its goal and move beyond its underlying sponsor.

To sum up, there are three types of prosodic faithfulness constraints: faithfulness to the lexical accent of a morpheme, faithfulness to the lexical accent of a morphological head and faithfulness to the position of the lexical accent. Unaccentability is the result of constraint interaction between the anti-migration constraint *FLOP and the structural constraint *DOMAIN. The abstract tableaux in (14) show how hypothetical outputs are evaluated with respect to the above constraints. Constraint ranking is irrelevant in this tableau. What is important is which constraint is violated by each output.

[16] In the Appendix I discuss a few tone languages in which *DOMAIN is high ranked giving rise to systems whose tone is always realized outside the domain of the morpheme that sponsors it. An accentual system with S(R) and high ranking of *DOMAIN exhibits primarily final stress and neutralizes lexical contrasts to the greatest extent.

(14)

σ(σ$_H$-σ	HEADFAITH	FAITH	*FLOP	*DOMAIN
a. σ(σ-σ				*
b. (σσ-σ			*	*
c. σσ-(σ		*	*	
d. σσ-σ	*	*		

(15)

σσ$_H$-(σ	HEADFAITH	FAITH	*FLOP	*DOMAIN
a. σσ-(σ				*
b. σ(σ-σ	*		*	

In the first tableau, candidate (14a) only violates *DOMAIN because it realizes the inherent accent within its morphological domain. Candidate (14c) moves the lexical accent to the suffix triggering two violations of faithfulness. First, *FLOP is violated because the lexical accent shifts away from its lexically pre-assigned position and, second, the lexical accent of the head is inserted to an underlyingly unmarked suffix causing violation of FAITH. *DOMAIN and *FLOP are violated in (14b) as well. The accent remains within the vicinity of the head but shifts to another vocalic peak. Finally, (14d) violates HEADFAITH (and FAITH) because the inherent accent of the morphological head is lost in the output.

In the second tableau, candidate (15a) violates *DOMAIN for the same reasons as (14a), whereas (15b) violates both HEADFAITH and *FLOP. The accent moves outside the suffix and, eventually, lands at the right side of the head, which is now added to a lexical accent (HEADDEP violation).

With the help of these constraints we will be able to analyze the accentual phenomena in this study. In Chapter 3, I show that in Greek and Russian prosodic faithfulness constraints occupy different ranks in the constraint hierarchy. Faithfulness to the lexical accent is ranked higher than faithfulness to the position of the accent. More importantly, the latter constraint is dominated by constraints that condition the prosodic shape of the word. *FLOP, however, dominates the structural constraint *DOMAIN, banning the migration of linked accents outside the territory of the morpheme they belong to. Moreover, this study provides ample empirical evidence in favor of a dichotomy in prosodic faithfulness between head faithfulness and simple faithfulness constraints.

2.2.3. Lexical specification and the lexicon

In Optimality Theory, Richness of the Base advocates the absolute absence of constraints on the input forms; *all* inputs are possible. This means that the theory can handle all putative inputs, those that contain accents and those that do not, without resorting to any stipulations about the structure of the lexicon. Prince and Smolensky (1993) and Itô, Mester and Padgett (1995) recognize the need for a more restrictive theory of the lexicon and propose that parses of different inputs are compared as to their relative *harmony*, where one is chosen which incurs the least violations of the high ranked constraints of the grammar. This is a consequence of Lexicon Optimization, which accomplishes two tasks: first, it leads the learner to choose the right inputs as underlying forms and second, it produces the right outputs.

In a language like Greek with high ranking faithfulness constraints (cf. Chapter 1 and Chapter 3), Lexicon Optimization entails that a root with a lexical accent such as /sta(fið-/, for example, will be preferred over a root with no lexical accent, /stafið-/, if the output is a word with a marked root, namely *stafíða*. Consequently, a Greek learner would choose the form which is closest to the output as an input because the Greek grammar deems the enriched input as more harmonic than an input without any accentual specifications.

The question that arises now is what exactly is stored in a Greek speaker's lexicon. Are all putative inputs actively present or only the most harmonic ones?

I assume that the speaker stores harmonic inputs as active part of the lexicon. Richness of the Base does not mean that there are no fixed input forms in the lexicon. Non-harmonic inputs are filtered out and only those that best satisfy the constraints are stored as active part of the lexicon. Given the fact that in Greek and the other lexical accent systems in this respect, faithfulness constraints are ranked high, inputs which best satisfy faithfulness are considered to be more harmonic than others and consequently, are stored in the lexicon. As a result, the largest part of the Greek vocabulary comes with a rich metrical structure.

Undoubtedly, this is an essential subject in Optimality Theory and more work needs to be done in pursuing this idea. Unfortunately, space and time pressure deter us from pursuing this question in detail.

2.2.4. Lexical accent: an autosegment or a prosodic role?

McCarthy and Prince (1995) and McCarthy (1995, 1997) discuss some cases of prosodic faithfulness in which a surface (output) form is prosodically faithful to the underlying (input) representation. In particular, McCarthy (1995), based on Inkelas's (1994) analysis of exceptional lexical stress in Turkish (cf. §2.3.1),

suggests instead of treating faithfulness to a lexically pre-assigned foot as an all-or-nothing affair, to make faithfulness sensitive to foot-internal positions occupied by segmental material.

Within a foot, a head and a tail part can be distinguished. The idea is now that marked morphemes are assigned a foot-head or a foot-tail role in the lexicon. Let us illustrate this with some examples from Greek. The last syllable of the accented root /stafið-/ in *sta*(*fíð-a* 'raisin-NOM.sg' is lexically pre-assigned with the prosodic role of a foot-head. The genitive suffix /-u/ in *anθrop-u*) 'man-GEN.sg', on the other hand, is prespecified to have a foot-tail role.

The underlying prosodic role of foot-head carried by the segments /fið/ in *sta*(*fið-a* is a feature that is transferred to the surface through a correspondence relation between the segments that constitute /fið/. Similarly, the lexically assigned feature of foot-tailness of the genitive suffix /-u/ in *anθropu*) is transmitted to the surface through segment correspondence as well. In other words, prosodic faithfulness is always mediated by the segments bearing the particular prosodic roles.

However, problems arise as soon as unaccentable or else, post-accenting morphemes are taken into consideration. The fact that a morpheme is specified to assign a foot-head role on segmental material that is not present until word formation will always pose a serious problem for the theory of correspondent prosodic roles.

At this point, the presentation of the theory of marking advanced in this thesis is brought into conclusion. In the remainder of this chapter, I present other theories of marking. Three approaches on lexical marking are distinguished in the stress literature. According to the first approach, conventionally named here *Lexical Constituency* (§2.3.), lexical stress[17] is an autonomous prosodic element that is affiliated to morphological or segmental material. As representative examples of this theoretical view, I present the marking theory proposed by Inkelas (1994) for the analysis of the Turkish exceptional vocabulary and the theory developed by Alderete (1997) for the analysis of Cupeño lexical stress.

According to the second view, which is given the conventional name *Lexical Representation* (§2.4), marking is the projection of intrinsic metrical structure from vocalic peaks. Halle and Vergnaud (1987) argue that syllables idiosyncratically project a head onto the stress plane, whereas Idsardi (1992) and Van der Hulst (1996) view marking as the idiosyncratic projection of syllable boundaries and foot-boundaries, respectively.

[17] Most of these studies refer to lexical accent as 'lexical stress'.

The third theoretical model, called here *Parameters and Constraints* (§2.5), is in favor of a mixed stress grammar in which marked words are not assigned metrical structure in the lexicon, but they constitute a subgrammar which is different from the grammar that derives regular stress. I discuss some representative theories along this line of thinking and, more specifically, Tsay's (1990) parametric theory of exceptional stress and Hammond's (1995) parochial constraint theory on lexical stress.

2.3. Lexical Constituency

2.3.1. Lexical marking as pre-assigned feet

Inkelas (1994) in a survey of Turkish stress and, specifically, exceptional stress patterns triggered by lexically marked suffixes, argues in favor of a prespecification account in which a marked morpheme is affiliated in the underlying representation with a foot. This foot interacts with a body of other factors to determine the stress pattern of the word that contains it. For the moment, what is of interest is that a trochaic foot is pre-assigned to a morpheme. Accented morphemes, roots and suffixes, have the representations in (16a-c). Pre-stressing suffixes can also be accounted in this model, as shown in (16d).

(16) *lexical marking as pre-assigned feet*

a.	(* .)		c.	(* .)	
	penalti	'penalty'		-Iyor	'PROGRESSIVE'
b.	(* .)		d.	(* .)	
	pendʒere	'window'		-mI	'INTERROGATIVE'

To elaborate on this model of lexical specification, an inherently stressed morpheme is underlyingly affiliated with a trochaic foot. In (16a-c) we see that both the head and the tail of the foot dominate segmental material. There are suffixes, however, like the one in (16d), in which the head of the trochee is left unfilled until it unifies with material of the base. This segmentally unsupported head resembles a catalectic syllable (Kiparsky 1991, Kager 1995, Van de Vijver 1998) although here the catalectic part of the foot is a head and not a tail. The lexical foot interacts with constraints of the grammar to determine primary stress.

An important advantage of this approach is that all exceptional morphemes have a uniform representation: they are lexically equipped with a trochee. Moreover, in this theory the lexical foot has an independent status; it is a prosodic constituent that is sponsored by a morpheme.

The independent nature of the lexical foot in this theory resembles the autosegmental analysis I propose for lexical marking. There are few less attractive aspects in this view. It is impossible, for instance, to have post-accenting morphemes in a trochaic system. Greek, however, falsifies this prediction. Moreover, it is unclear how morphemes that impose an accent beyond the neighboring syllables can be represented in this theory. (The next section shows that such morphemes are empirically attested.)

2.3.2. Lexical marking as inherent prominence

In the analysis of the lexical stress of Cupeño, Alderete (1997) represents lexical stress as pure prominence. More specifically, lexical stress is encoded as an intrinsic feature of an underlying sponsor which has no phonetic realization until it is projected onto the grid where it is aligned with prosodic constituents (Alderete 1997:3). Some examples from Cupeño are given in (17). The root in (17a) has an inherent prominence as opposed to the root in (17b), which is stressed on the initial syllable by default. The suffix *-nuk* in (17c) has a floating accent (represented here for typographic simplicity with an accent ‘´’ before the sponsoring morpheme). This accent is linked to the right edge of the root by language-specific alignment constraints.

(17) *lexical marking as prominence*

a.	təmál	/təmá-l/	‘ground’
b.	máxan	/max-an/	‘give it to me’
c.	wəná-nuk	/wəna-´ nuk/	‘having put in’

Alderete’s proposal is along the lines of the model advanced in this study. The only difference is that in the present study a lexical accent has two valences; it is realized as high and low tone in pitch-accent systems (Fore, Japanese), as head and tail in lexical accent systems with a foot organization (Greek, Russian and Lillooet Salish), and as head and grave accent in prominence systems (Thompson Salish). An advantage of the approach promoted here is that it can also account for accents that have duration but no prominence. There are some marked morphemes in Cupeño whose accent protects the vowel from reduction, but it does not have prominence:

(18) *suffixal weak prominence in Cupeño* (Hill and Hill 1968:236)
ʔísi-l^{y}ə-yə → ʔísɨ̀-l^{y}ə-yə [ʔís**i**-l^{y}i] ‘coyote (objective case)’

In this example the suffix /-yə/, which marks objective case, imposes an accent on the last syllable of the root. This accent protects the last vowel of the root from reduction or deletion.

2.4. Lexical Representation

There are three major trends in the Lexical Representation approach. Marks, as abstract entities, can take the form of pre-assigned heads (§2.4.1), foot-brackets (§2.4.2) or syllable-boundaries (§2.4.3). In the following subsections, I sketch the basics of each model. Special attention is given to the syllable-boundaries approach since this theory has been applied to lexical accent systems as well.

2.4.1. Lexical marking as prespecified heads

In his analysis of Vedic accent, Kiparsky (1982) develops a unified analysis of stress according to which word accent is compositionally derived by general phonological rules that do not refer to specific morphemes or classes of morphemes. The essential features of this analysis are based on the assumption that some morphemes bear a lexical accent on some syllable in their underlying representation. Halle and Vergnaud (1987), elaborating on this idea, suggest that marked morphemes are supplied with ‘asterisks’, which are projected onto the stress line. According to their theory, stress is represented on an autosegmental line as a sequence of abstract positions or slots associated with the stress-bearing units on the line of phonemes. An asterisk represents each stress-bearing unit, (*). The line of phonemes, which is designated as *line 0*, mediates the correspondence between stress-bearing units and the stress line, *line 1*, as exemplified in (19).

(19)
```
* . * . * .      line 1
* * * * * *      line 0
σ σ σ σ σ σ
```

In the abstract form in (20), the string of stressable elements is analyzed into a sequence of binary constituents whose boundaries are indicated with parentheses. Each stress domain contains exactly one position that is distinguished from all others as more prominent. This stressed element is the

head of each binary grouping and is designated by an asterisk on line 1. The abstract form in (20) depicts the derivation.

(20)
```
 *  .  *  .  *  .        line 1
(* *)(* *)(* *)        line 0
σ σ  σ σ σ σ
```

In short, stressed elements are identified by occurrences on the higher line of the same asterisk that is used to identify the stress bearing element on line 0. Crosslinguistic variation in stress results from a limited number of parameter settings that generate metrical constituency in the fashion just sketched. The position of primary stress is determined by a language-specific rule.

Coming back to our discussion, a marked morphological element in this theory has a prespecified head, which is projected onto the stress line. A word like *gáva* 'cow-INSTR.sg', for example, in Sanskrit, composed of two marked morphemes, /*gáv-á*/, has the representation in (21).

(21) *lexical marking as head projection on the grid*

```
 *    *          line 1
(*)  (*)         line 0
gav-  a                  'cow-INSTR.sg'
```

The language-specific word-stress rule applies to assign primary stress to one of the two competing heads. In our example, the accent of the root is eventually assigned prominence. The exact way accentuation is pursued in Sanskrit falls outside the scope of the present discussion. Similar representations of marking have been adopted by a number of other scholars (Halle (1973), Halle and Kiparsky (1977, 1981) for Russian; Steriade (1988) for Ancient Greek; Melvold (1990) for Russian; Bat-El (1990, 1993) for Modern Hebrew).

For Halle and Vergnaud, accents are input to a certain set of stress rules. The most important aspect of this approach is that purely phonological principles decide on the future of marks. It is the overall stress algorithm of the language that determines whether a particular accent will surface or not. However, the approach seems to have a problem with the representation of more sophisticated forms of marking like preaccentuation and unaccentability which both imply, in some way or other, accent on neighboring syllables. Under Halle and Vergnaud's approach, we must assume that in these types of marking the marked syllable has the ability to assign its asterisk/diacritic on other syllables of the stress plane. However, it is hard to explain on what grounds it is decided

whether the syllable will project its inherent stress onto its own grid or the grid of some other syllable. The theory has to improvise extra rules or limitations for marking.

Another less attractive aspect of the theory is that it cannot represent weak accents. Empirically, we have seen that there are marked syllables in the string that do project an asterisk onto the grid lane, but this asterisk must always be weak. The Greek pre-accenting suffixes and the Thompson grave accent, discussed in §2.2.1, are empirical instantiations of this theoretical possibility.

Apart from lexical specification, problems also arise when the word stress rule cannot guarantee the desirable results for all words. Once more, Greek provides the crucial example. At this point, let us assume that the words *uranú* 'sky-GEN.sg' and *stafíðon* 'raisin-GEN.pl' have the underlying representations /*urán-ú*/ and /*stafíð-ón*/, respectively. (Cf. Chapter 3 for justification of these marking patterns.) This means that within the same language, prominence is both right-headed, *u*(*ranú*), and left-headed, *sta*(*fíðon*).

In the next section, I present a modified version of this theory that represents marks in the form of pre-assigned brackets.

2.4.2. Lexical marking as prespecified brackets

Van der Hulst (1996) compares lexically assigned marks to syllable weight. Marks partition the syllables of a string into two categories, those which can attract stress and those which cannot attract stress (or they attract stress only in the absence of marked syllables). This highly resembles the behavior of heavy syllables towards light ones; heavy syllables are by nature stress-attracting whereas light ones are given this opportunity only in the absence of heavy syllables. For this reason, he refers to marks as *diacritic weight*.

Under the influence of Idsardi's (1992) theory (cf. §2.4.3.), marks are represented by means of foot-brackets that marked syllables project onto the grid. A left foot-bracket '(' or an asterisk (*) indicate diacritic weight. This notational convention is used indistinctly with the asterisk '*'. This model designates lexical marking of extrametricality by using the right-foot bracket ')'. Let us see how it accounts for the Polish words with exceptional antepenultimate and final stress.

(22) *lexical marking as prespecified brackets*

		)		(* *)	* (* *)
a.	gramatyk-a	→	gramatyk-a	→	gramatyk-a

```
                                        *
        (           *          (*)      (*)
b.  rezim  or  rezim  →  rezim  →  rezim
```

Stress on the antepenultimate syllable arises from extrametricality of the final syllable which is marked as such by a right foot-bracket at its left, (22a). Similarly, final stress is derived by having either a left-foot bracket (or an asterisk) at the left of the marked syllable, (22b). Needless to say, main stress is assigned to marked words by the same principles as those that assign stress to unmarked ones (e.g. binary trochaic feet, word stress on the rightmost foot, etc.)

The problem with this approach is that it appears to be inconsistent with respect to the use of the right-foot bracket. The right-bracket marks not only extrametricality but also a possible position of accent. For example, in the word *gramátyk*, penultimate stress is derived as follows:

(23)

```
                                  *
          )        (*  * )       (*  * )
gramatyk →  gramatyk  →  gramatyk
```

In (23), the right foot-bracket marks penultimate stress and not extrametricality. However, the only reason that motivates the use of a right foot-bracket is the parallel existence of the form *gramátyka*, (22a). We have seen above that this form necessitates extrametricality of the inflectional ending and is marked with a right foot-bracket. However, in our example the correct pattern could be reached by using a left foot-bracket as well, *gra*(*mátyk*.

Moreover, the two brackets do not have the same theoretical weight. In fact, their function is rather asymmetric. The right bracket has a restrictive function; it restrains the scope in which stress rules apply. For instance, the bracket at the right edge of the word in (23) reveals nothing about the possible position of stress. This is decided by the stress algorithm. On the other hand, a left foot-bracket denotes the position of stress in a more straightforward way, as shown by the example in (22b).

The model has some other inconsistencies. The equation '('='*' holds only when the mark occupies the final or pre-final syllable of the word, in other words when there is available space for hosting exactly one (monosyllabic or disyllabic) foot. If we use the left foot-bracket to other than the last two syllables of the word/morpheme, the wrong stress pattern arises. This is illustrated in (24). Keep in mind that monosyllabic feet are allowed in marked words as suggested by *rezím* in (22b).

(24)

(	(* .)	(* .)(*)	* (* .)(*)
universitet →	universitet →	universitet →	universitet

The advantages of the foot-bracket theory are that, first, it accounts for accentual stability in the paradigm (*gramátyk*, *gramátyka*) in a uniform way. Second, the use of foot-brackets offers the appropriate tools needed for the representation of post- and pre-accenting morphemes.

2.4.3. Edge, parenthesis and head parameters

2.4.3.1. The theory

Idsardi (1992) and Idsardi and Halle (1995) develop a stress theory which can uniformly account for a wide range of stress patterns including the exceptional varieties of fixed systems as well as the lexical accent variety of free systems. Here, I am only interested in the applications of the theory to marked patterns of stress. The general premises of the theory are presented in the following paragraphs.

The theory constructs a phonological plane, the metrical grid, familiar from Prince (1983) and Halle and Vergnaud (1987). Metrical constituents are created by placing boundaries on the metrical grid. Grid marks are projected onto the metrical plane by special rules of projection. The emphasis of this theory is on the placement of metrical boundaries. Metrical boundaries have the form of parentheses which are elements with their own entity on the grid. In this theory a left parenthesis '(' indicates that the material to its right up to the next parenthesis comprises a constituent; and, similarly, a right parenthesis ')' indicates that the material to its left comprises a constituent. In a way, parentheses act as junctures. As already noted, special rules will project the stress-bearing morphemes, that is, the heads of the syllables, onto the metrical plane.

(25) *line 0 mark projection*
Project a line 0 element for each syllable head.

Moreover, Idsardi (1992) argues that in many languages syllable boundaries play a role in the computation of stress as well. A rule called the Syllable Boundary Projection Parameter is responsible for projecting syllable boundaries onto the metrical grid. This rule is given in (26).

(26) *syllable boundary projection parameter*
Project the left/right boundary of certain syllables onto line 0.

The projection of syllable boundaries in (25) is different from the projection of grid marks in (26). All languages invoke some form of (25) but only some languages invoke (26). It depends on the specific language whether (26) is triggered by a heavy or an accented syllable. To illustrate the theory described so far I borrow Idsardi's (1992:2) example of Koya. The stress rule for Koya is described in (27).

(27) Stress falls on the head of every closed or long syllable (CVX) as well as on the head of the initial syllable. Main stress is on the initial syllable.

This language projects the left boundary of heavy syllables onto the metrical grid, according to the rule in (26), as shown in (28).

(28)
```
  x   x  ( x     x  ( x        line 0
CV CV CVX CV CVX
```

However, like heavy syllables, the first syllable has increased prominence. Therefore, the first syllable must also correspond to a constituent edge. To achieve this, a left parenthesis must be placed before the leftmost element of the string. Universal Grammar, according to Idsardi, provides a parameter that allows us to place a parenthesis at an edge of a form. This is the Edge-marking Parameter, given in (29).

(29) *edge-marking parameter*
Place a left/right boundary to the left/ right of the left-/rightmost element in the string

Koya sets Edge:LLL, that is, it places a LEFT boundary to the LEFT of the LEFTmost element, producing the grid in (30).

(30)
```
 (x   x  ( x     x  ( x        line 0
CV CV CVX CV CVX
```

Now we still need to add prominence to the first element in each constituent formed by a boundary. This is controlled by the Head Location Parameter:

(31) *head location parameter*
Project the left/right-most element of each constituent onto the next line of the grid.

This parameter designates a grid-internal interface between layers of the grid: to build further layers of the grid, certain elements must be again projected. Koya sets the Head Parameter on line 0 to 'left', Head:L, generating (32).

(32)
```
   x       x       x
 ( x   x ( x   x ( x          line 0
CV CV CVX CV CVX
```

The final step is to apply the Edge-marking and Head Parameter to line 1. In Koya the line 1 settings are the same as those in line 0. Thus, the settings Edge:LLL and Head:L yield the grid in (33):

(33)
```
   x
 (x       x       x          line 1
  x   x ( x   x (x           line 0
CV CV CVX CV CVX
```

To complete the model I must introduce one more parameter, namely the Iterative Constituent Construction Parameter (ICC), which is responsible for iterative effects of stress:

(34) *iterative constituent construction parameter*
Insert a parenthesis every two elements starting from the right/leftmost element.

Having given a general picture of Idsardi's framework, let us move on how this systems accounts for marked patterns in the lexical accent system of Russian.

2.4.3.2. Lexical marking in Russian

In this section, I examine how Idsardi's theory applies in lexical accent systems. I choose Russian to be the language of exemplification. Most morphemes in Russian are lexically marked with special parentheses-settings. Consequently, roots and suffixes, but not whole words, belong to different classes: unstressed, stressed and post-stressing. Unstressed mor-phemes have no prespecified Edge settings and stressed morphemes have a variety of Edge parameter values

depending on the position of stress in the string of syllables. Finally, in post-stressing morphemes the parameters are set up in a configuration that renders a left syllable boundary at the end of the morpheme. This classification corresponds to various types of lexical Edge marking, as shown in (35). Notice that it is always a left parenthesis that is projected onto the string.

(35)

Unstressed	xxx	No Edge
Post-stressing	xxx(	Edge:LRR
Stressed	(xxx	Edge:LLL
	x(xx	Edge:LRL
	xx(x	Edge:LLR

The parameter settings for word stress are Edge:LLL and Head:L. This means that a word composed of unmarked morphemes displays initial stress. Implementing the described parameters to words composed of marked morphemes, we get the derivations in (36) (Idsardi 1992:53). In the following table the roots of the first two examples are inherently equipped with metrical information. The third root is unmarked. In all three cases the inflectional suffix is stressed. Although the word-stress rule assigns primary prominence to the leftmost bracket, the result is different for each example because of the idiosyncratic Edge specification in line 0.

(36)

Examples	Edge:LLR *rabóta* 'work-NOM.sg'	Edge:LRR *gospozá* 'lady-NOM.sg'	Edge: ∅ *borodá* 'beard-NOM.sg'
Lexical Edges	x (x (x rabot - a	x x ((x gospoz -a	x x (x borod - a
Line 1	x	x	x
Head:L	(x x	x	(x
Edge:LLL	x (x (x rabot - a	x x ((x gospoz - a	x x (x borod - a

The above derivations make clear that, putting aside the projection of lexically determined values for the Edge parameter, marked words share with unmarked ones the parameter settings for word stress. However, this is true only for inflected words, words composed of a root and an inflectional suffix. In derivation, some stressed suffixes have the property of attracting primary stress from roots as, for example, the suffix /-an/ in *bratán* > /brát-án/ 'big brother'.

To account for this Idsardi has two options: either to insert a special rule that deletes the parenthesis of the root, or to change the parameter settings for line 1. The first option employs theoretically unmotivated rules of parenthesis insertion/deletion. The second option implies that specific derivational suffixes are equipped with intricate markedness properties; they must have lexically marked Edges both for line 0 and line 1.

Another drawback of Idsardi's model is that it overgenerates; it produces the same patterns by a combination of different parameter settings. As mentioned earlier, Idsardi suggests that three-syllable stressed roots have the Edge specifications in (37). However, a disyllabic root with final stress, σσ́, can be marked either as Edge:LLR or Edge:LRL.

(37)

Stressed	(xx x(x	Edge:LLL Edge:LRL or Edge:LLR

The redundancy in the representation becomes more apparent in trisyllabic morphemes. One can argue in favor of the representations in (38) which, with the aid of the Iterative Constituent Construction parameter, can correctly derive the very same stress patterns as the principles in (35).

(38) *new representation*

xxx) Edge:RLR
xx)x Edge:RRR
(xxx Edge:LLR

(39) *example*

Project Lexical Edge:RRR	x x x) σ σ σ
ICC:Right to Left	x (x x) σ σ σ
Line 1 Head:L Edge:LLL	x (x x(x x) σσ σ

Finally, the model cannot account for four-syllable roots of the accentual form σσσσ. Such roots do exist in Russian but they are usually borrowings from

other languages, e.g. *ginekólog* ‘gynecologist’, *temperáment* ‘temperament’. Idsardi (1992:52) arbitrarily stipulates that these forms are polymorphemic, without, however, spelling out how they are marked within the representational schema he proposes for Russian. It is obvious that in Idsardi’s model, a left parenthesis needs additional assumptions such as extrametricality of the final syllabic constituent to derive the desired outcome for four-syllable or even longer words.

It is evident that Idsardi was influenced by Halle and Vergnaud’s theory of marking. Marked syllables are projected onto the grid and participate in the stress algorithm in both theories. The difference is that in Idsardi’s theory, syllables project boundaries[18] and not vocalic peaks. This point of divergence, however, has a dramatic consequence for the way the two theories account for accentual phenomena. In the first theory, syllables project headedness, ‘*’. In the second theory, syllables project boundaries, ‘)’, ‘(’, and headedness relies on other parameters, most of the time.

More importantly, it seems that syllable boundaries do not have the same theoretical weight. The asymmetry between a left and a right boundary, first observed in Van der Hulst’s model (§2.4.2), holds for this theory as well. A left boundary is equivalent to headedness as opposed to a right boundary that usually defines the domain in which stress parameters apply. Idsardi (1995:15) assumes that the Polish words *gramátyk* and *rezím*, for example, are marked with a right boundary at the right side of the word, *gramátyk*) and a left boundary at the left side of the final syllable, *re*(*zím*, respectively. Although in the second form the left boundary already decides for the position of stress, in the first one the boundary entails nothing about the position of stress. The application of ICC, together with the Edge and Head parameters (line 0), determine stress. Interestingly, the inherent asymmetry between syllable boundaries leads to another type of asymmetry. A left boundary can be used independently from the ICC parameter, whereas a right boundary presupposes the ICC parameter. Assuming that the ICC parameter creates effects similar to footing, a broader generalization would be that a left boundary can be used for foot-based languages, as well as languages that have peak prominence, while a right boundary can be only used for foot-based systems.

Finally, what remains is to examine how our theory balances in relation to Idsardi’s model. Right and left-foot brackets do not have any theoretical weight in this thesis. They are the typographical notation for strong and weak lexical accents. Moreover, the value of our model relies basically on two points: first, it employs a marking apparatus that can apply to all languages in a uniform way as

[18] I leave unquestioned here the theoretical weight of notions such as ‘syllable boundary’ and the content of rules having syllables projecting their boundaries on the grid.

opposed to Idsardi's marking model that is dependent on the overall algorithm of the language. Second, our marking abstracts away from the problem of having words with similar stress pattern derived by different marking settings. To illustrate with an example, according to our model marked words in Polish have the representations in (40). From a learnability point of view, this marking mechanism is easier to compute; both pairs in (40) have an underlying (foot)head.

(40) a. gra(mátyk gra(mátyka
b. re(zím re(zímu

This chapter is rounded off with a short examination of theories that view marking as part of a subgrammar.

2.5. Parameters and Constraints

It has been proposed that marked words are nothing more than small subsystems in the overall stress grammar of the language. This view has been expressed in two ways: marked words are the result of different parameter settings (§2.5.1) or 'parochial' constraints or constraint rerankings (§2.5.2).

2.5.1. Lexical marking as variable parameters settings

Tsay (1990) introduces a parametric theory of stress according to which the same parameters are used for assigning regular, as well as exceptional stress, but for each case the parameters are set to different values. She motivates her proposal based on the observation that exceptional stress in Polish and Slavic Macedonian is not radically different from the regular stress pattern, but it 'falls into systematic patterns' in the sense that it occurs only in specific syllabic positions in the word.

Within this account, the difference between regular and exceptional stress is just a difference in the values of some parameter. Morphemes are marked underlyingly as to which parameters are chosen. To exemplify, words with exceptional antepenultimate stress in Polish set on the parameter of extrametricality. However, the parameter of extrametricality is set off for regular penultimate stress. Changing the foot-headedness parameter from left-headed to right-headed, we derive the difference between (ante)penultimate stress, *gra*(*máty*)*ka, hipo*(*pótam*), and final stress, (*rezím*).

This approach seems to gain ground in cases of morphology-dependent stress

as in Spanish or English. We can argue that different parameter settings are associated with different morphological classes or categories. For instance, in English extrametricality is on in nouns but off in verbs.

The disadvantage of this approach is that it cannot account for phenomena related to the stability within the paradigm. For instance, we will have to assume different parameter settings for the paradigm of the Polish word *gramátyka* 'grammar-NOM.sg', *gramátyk* 'grammar-GEN.pl' because the former has antepenultimate stress whereas the latter has penultimate stress.

In addition, by setting different parameters on and off, the theory becomes too powerful since it can predict radically different accentual patterns for exceptional words. For example, by setting the parameters in particular values, one could predict a language that has regular stress on the penultimate syllable and exceptional stress on the leftmost heavy syllable of the word. A possible route would be to define a constrained system of principles that are hierarchically ordered according to the importance that a specific language assigns to them. This is something that Tsay's systems cannot account for, as opposed to the system developed in this thesis.

Finally, a more general problem with this model is that it cannot decide which parameter setting is preferred in cases where two morphemes with conflicting parameters are met. As mentioned earlier, there are morphemes in Greek that demand final stress (e.g. uran-) and suffixes that invoke penultimate stress (e.g. -u). The empirical facts suggest that in this case the root wins over the suffix (e.g. *uranú*). However, it is difficult to imagine how the parametric theory can be formulated in order to account for these facts.

2.5.2. Lexical marking as 'parochial' constraints and constraint-reranking

With the blooming of the constraint-based framework of Optimality Theory (Prince and Smolensky 1993, McCarthy and Prince 1993a, 1994), some scholars experimented in encoding exceptional or marginal metrical information in terms of different constraint rankings.

The notion of *family of constraints* is crucial for Optimality Theory. One of the constraint families is *Generalized Alignment* (McCarthy and Prince 1993b) which includes constraints that figure how constituent-edges are aligned in morphological and phonological processes. Generalized alignment demands that a designated edge of each prosodic or morphological constituent of a certain category coincide with a designated edge of some other prosodic or morphological constituent. For example, ALIGN (σ, L, PrW, L) requires the left edge of a syllable to be aligned at the left edge of the prosodic word, and ALIGN

(σ, R, Ft, L) requires the left edge of a syllable to be aligned at the right edge of a foot.

Hammond (1995) uses alignment constraints to analyze marking patterns in Spanish. For him, each word bearing a marked stress pattern has its own alignment constraint, crucially ranked above the other constraints of the language. For example, Hammond suggests the following constraint for the word *sofá*: ALIGN (sofa, R, Head (Ft), R), which means that the specific word *sofa* aligns its right edge with the right edge of the head of the foot. Similarly, an exceptional word such as *pajaro* is escorted by the constraint ALIGN (pajaro, L, Head (Ft), L), which is read as follows: "align the left edge of the word *pajaro* with the left edge of the head of the foot". Hammond calls these constraints 'parochial constraints' and argues that they take priority in ranking compared to the constraints that determine the regular (default) penultimate stress of the language.

Garrett (1996) points out an important problem in Hammond's proposal: parochial constraints are language specific and their use leads to a system containing hundreds of constraints that are completely unordered with respect to each other.

Another proposal, in the spirit of Tsay's parametric theory of marking but formulated in terms of constraints is Revithiadou's (1997a) analysis of marked words in Greek, Russian and Modern Hebrew. She argues that marks target positions that lead to the construction of templatic, strictly binary prosodic words. (This idea was introduced in the Introduction and is fleshed out in Chapter 3 where the interested reader will find all argumentation). More specifically, there is a set of constraints that control the prosodic form of the word:

(41) *prosodic form constraints*

a. F(OO)TBIN(ARITY) (Prince and Smolensky 1993)
   Feet must be binary.
b. PARSE-σ (McCarthy and Prince 1993a)
   All syllables must be parsed into feet.
c. ALIGN (Ft, L/R, PrW, L/R) (McCarthy and Prince 1993b)
   Align the left/right edge of the foot with the left/right edge of the prosodic word.

To give an example, the stress variability in Greek: *ánθropos* 'man', *fantáros* 'soldier', *uranós* 'sky', is derived by ranking the constraints in (42) in different hierarchical orders. The list of rankings is given in (42).

(42) a. *ranking* A ≻ ánθropos: ALIGN-L >> ALIGN-R, FTBIN >> PARSE-σ
b. *ranking* B ≻ fantáros: ALIGN-R >> ALIGN-L, FTBIN >> PARSE-σ
c. *ranking* C ≻ uranós: ALIGN-R >> ALIGN-L, PARSE-σ >> FTBIN

For words like *ánθropos* it is more important to have a binary foot aligned at the left edge of the prosodic word, (*ánθro*)*pos*, than parse all syllables of the string into feet, *(*anθro*)(*pós*). A word like *fantáros* imposes the same requirements with the difference that the foot should be aligned at the right edge of the word, *fan*(*táros*). However, words of the type *uranós*, align the foot at the right edge of the prosodic word but also allow the parsing of syllables into unary (monosyllabic) feet, (*ura*)(*nós*). This constraint ordering results in final stress.

The constraint-based approach appears to be more restricted than Tsay's parametric theory on marking because of the notion of 'ranking'. The parameters now take the form of constraints, and are ranked with respect to each other in a specific way: the language makes use of three rankings only.[19]

However, this theory has some unpleasant aspects. Most paradigms in Greek have stable stress on one of the three permissible syllabic positions. However, this generalization does not hold for words with antepenultimate stress and accentual alternations within the paradigm. More specifically, three different accentual paradigms are exhibited by words with antepenultimate stress, all given in (43). The paradigms of *klívanos* and *stafíða* in (43a) have fixed stress in singular and plural. The paradigm of *ánθropos* in (43b) has stress on the penultimate in genitive and antepenultimate stress elsewhere. Finally, *θálasa*-type nouns, (43c), have initial stress in all grammatical cases except the genitive plural which displays final stress.

(43) *accentual patterns of words with antepenultimate stress*
a. klívanos (NOM.sg), klívanu (GEN.sg), klívani (NOM.pl)
stafíða (NOM.sg), stafíðas (GEN.sg), stafíðon (GEN.pl)

b. ánθropos (NOM.sg), anθrópu (GEN.sg), ánθropi (NOM.pl)
c. θálasa (NOM.sg), θálasas (GEN.sg), θalasón (GEN.pl)

[19] Cf. Anttila (1995, 1997) for a constraint-based account of variation in grammar, Nouveau (1994) for a similar approach to exceptional stress patterns in Dutch and Drachman, Kager and Malikouti–Drachman (1997) for a constraint-reranking approach on prosodic allomorphy in Greek.

One way to account for the facts in (43) is to assume that the class of words with antepenultimate stress is further divided into three subclasses. However, this proposal does not explain why this divergence is only attested in words with antepenultimate stress and not in words with (pen)ultimate stress.

Another route that can probably account for this question is to argue that morphemes, and not words, are associated with specific rankings. In this spirit, antepenultimate stress in (43b) is triggered by the root or the suffix. It is more economical to assume that the triggering morpheme is the root.[20]

Now, we can further argue that penultimate stress in (43b) is caused by the genitive singular inflectional suffix /-u/ which, as opposed to other suffixes, is lexically associated with ranking B. If penultimate is the stress pattern of the output word, then the ranking of the suffix (ranking B) outranks the ranking of the root (ranking A) that endorses antepenultimate and not penultimate stress. Similarly, ultimate stress in (43c) is due to the constraint ranking C introduced by the genitive plural suffix /-on/. However, this solution is not successful either. If a marked suffix imposes its own ranking to the root, then how can we explain that the genitive /-u/ does not trigger penultimate stress in the paradigm of *uranós* and, similarly, the genitive suffix /-on/ does not trigger ultimate stress in the paradigm of *stafíða*? Why can the corresponding genitive suffixes in these examples not outweigh the ranking of the root? Moreover, there are many technical problems in defining how the ranking should be modeled in words which are composed of morphemes with conflicting accentual demands. We conclude, therefore, that this theory cannot really offer satisfactory answers to crucial aspects of accentuation in lexical accent systems.

[20] An opposite approach that attributes the accentual difference between *ánθropos*, *fantáros* and *uranós* to a suffix must admit the existence of at least three accentual classes for the suffix *-os*; a first class that introduces ranking A as in *ánθropos*, a second class that introduces ranking B as in *fantáros*, and a third one that triggers ranking C as in *uranós*. Moreover, it must employ a special rule to combine a root with a particular accentual type of suffix.

Appendix: Evidence for Unaccentability from Tone Languages

Carleton and Myers (1996) analyze the phenomenon of tonal transfer in Chichewa, a Bantu language spoken mainly in Malawi. The verb stem in Chichewa consists of a root, followed by any number of suffixes called 'extensions', and an obligatory inflectional or nominalizing suffix called the 'final vowel' (FV). Here and throughout this section, morphemes that introduce a high tone are underlined. The acute accent designates a high tone. When necessary, the stem is delimited from the remaining formatives of the word with square brackets.

The high tone is realized on the final syllable when it belongs to the root (1a) or the extension (1b). If the verb stem includes more than one high-toned morpheme, only one high tone is realized (1c). No high tone appears when the stem does not sponsor a high tone (1d). If the high tone belongs to some other morpheme within the word as, for example, the present habitual marker /-ma-/ in (1e), then it is realized on the penult. Notice that there are morphemes that introduce a high tone and are associated to it, such as the subjunctive /-e/ in (1f) and the stem in (1g).

(1) *Chichewa verb stems* (Carleton and Myers 1996:43-45)

a.	tambalal-á	stretch out legs-FV	'stretch out your legs!'
b.	phik-its-á	cook-INTENS-FV	'really cook'
c.	tambalal-its-á	stretch out legs-INTENS-FV	'really stretch out your legs!'
d.	sangalal-a	enjoy-FV	'enjoy yourself!'
e.	ndí-ma-[sangalál-a]	I-HBT-be happy-FV	'I am happy'
f.	sangalats-é	we-please-SUBJ	'let's please'
g.	yékha		'alone'

There are also cases in which the high tone occurs in the verb stem because of a preceding inflectional morpheme. Some prefixes with this behavior are the recent past *na* in (2a) and the infinitival *ku* in (2b):

(2) *Chichewa prefixed forms* (Carleton and Myers 1996:46)

a.	ndi-na-[sángalats-a]	I-PAST-please-FV	'I pleased (recent past)'
b.	ku-[sángalats-a]	INF-please-FV	'to please'

None of the morphemes in (1) and (2) bears the high tone itself. The high tone migrates to a neighboring morpheme of the verbal formative. Thus, in (1c) both the high tone of the root and the high tone of the extension land on the final

vowel of the stem, whereas in the examples in (2), the high tone of the prefix sites on the initial syllable of the tone-free root. In other words, there are morphemes that introduce a high tone but they cast it off their morphological domain.

Carleton and Myers are particularly concerned with the tonal behavior of the prefixes in (2). They posit the morpheme-specific constraint *DOMAIN to account for the fact that the tones of a certain group of morphemes are never realized within their morphological domain. The constraint is given in (3).

(3) *DOMAIN: $*H_{\alpha}$
$[\ldots \sigma \ldots]_{\alpha}$ (α=RECENT PAST, INF, etc.)

The examples just described evidence the existence of 'unaccentable' morphemes in Chichewa. Roots and suffixes introduce a lexically assigned high tone, which is realized outside their morphological domain. It is not hard to grasp the similarity with the Greek examples. Unaccentable morphemes in Greek introduce a lexical accent which is realized on a morpheme other than the sponsoring one, e.g. *uran-ós* 'sky'.

The next case of unaccentability comes from Sukuma, a Bantu language spoken in Tanzania. The core feature of this language is the rightward shift of high tones. Some examples of Sukuma accentuation are listed in (4) (Sietsema 1989:242-69).

(4) *Sukuma verbal tone*

a.	ku-laal-á	'to sleep'
	ku-tonol-á	'to pluck'
b.	ku-sol-a	'to choose'

Sukuma verbs are either lexically specified with a high tone (4a) or have a default low tone (4b). Within the verbal words, the high tone is always realized outside the domain of the sponsoring morpheme, as shown in (4a).

Interestingly, the high tone is not always on the syllable immediately following the sponsor morpheme. The distance between the leftmost syllable of the sponsor morpheme and the syllable that the high tone lands onto is two moras.

(5)

a.	ku-bon-aníj-a	'to see simultaneously'
b.	ku-su-aníj-a	'to spit simultaneously'

Stems are not the only source of high tones in verbal words. Object markers (6a) and subject markers (6b) may have high tones as well; these tones shift two moras when combined with the toneless verb stem *sol* ‘choose’. If both a high-toned object marker and a high-toned subject marker are present in the verbal word, the distance of shift of the high tone that belongs to the subject marker is reduced to one mora (6c-d). A similar one-step shift of the high tone is also witnessed when there is a high-toned verb following (6e-f).

(6) *Sukuma one- and two-step tone shift*

a.	a-ku-ba-sol-á	‘he will choose them’
b.	ba-ku-sól-a	‘they will choose’
c.	ba-kú-ba-soléla	‘they will choose them for someone’
d.	ba-kú-ba-alúla	‘they will dress them up’
e.	ba-kú-laal-á	‘they will sleep’
f.	ba-kú-tonol-á	‘they will pluck’

Two major observations are drawn from the examples in (6). First, the morpheme that introduces a high tone never bears the high tone within its domain. Second, and more importantly, every sponsor creates a binary foot domain (two syllables or moras) within which the high tone cannot be realized. This domain may include either the sponsor-morpheme itself (7d-f) or it can even be extended to include syllabic material from the following morpheme (7a-b). As a result, the high is always aligned to the first available element outside the ‘opaque’ foot domain created by the morpheme introducing the high. Binarity is violated when two high-toned morphemes follow each other with only one syllable intervening (7c-f).

(7) *foot-domain unaccentability in Sukuma*

a.	a-ku-(ba-sol)á	d.	(ba)-kú-(ba-a)lúla
b.	(ba-ku)-sóla	e.	(ba)-kú-(laal)á
c.	(ba)-kú-(ba-so)léla	f.	(ba)-kú-(tonol)á

To summarize so far, Sukuma has both high-toned and toneless morphemes. High-toned morphemes create a binary domain, either within their own morphological domain or, if necessary, by incorporating material from neighboring morphemes. The high tone is banned from this binary metrical domain and is realized in the immediately following segmental material. There is one case in which the opaque domain is not binary: when there is a danger the high tone not to be realized at all as, for example, in (7c). Here, by creating a binary domain, the first high tone would have to land on the first syllable of the

following morpheme, /ba-/, which is also a sponsoring morpheme and hence an unaccentable domain.[21] However, there is also the possibility of two high-tone morphemes to follow one after the other. In this case one of the high tones is lost, as shown in (8).

(8) *high tone loss*

a. a-ku-ba-bon-elá ‘he will find them’ (*a-ku-bá-bon-elá)
b. ba-kú-ba-bon-elá ‘they will find them’ (*ba-kú-ba-bón-elá)

Sukuma is another instantiation of the effects of unaccentability in grammar. In this case the unaccentable domain extends beyond the morphological borders of the sponsor. The importance of Sukuma relies on the fact that opacity to high tone can also be a property of metrical domains such as the foot.

In Kikuyu the left edge of high-toned verbal formatives is opaque to the sponsored high-tone. This is illustrated in (9).

(9) *Kikuyu left-edge unaccentability*

a. to-hetók-aγa ‘we go’
b. to-mo-tom-áγa ‘we send him/her’

Bickmore (1996) argues that such displacement effects are due to a high ranked constraint that prohibits the alignment of the high tone with the left edge of the sponsor-morpheme. This constraint, named *ALIGN, is stated in (10) (Bickmore 1996:15).

(10) *ALIGN (high, L, So, L)
The left edge of a high tone span must NOT align with the left edge of the lexical source.

To summarize the discussion, we have seen various forms of unaccentability in the languages described along the above lines. The most important corollary is that unaccentability can be both an idiosyncratic as well as a general characteristic of an accentual system. In Chichewa and in Greek, it is expressed

[21] The reason why the high tone of *ba* is not realized in the domain of the following morpheme, namely *bon*, is that high tones on adjacent vowels are fused into a single high (Sietsema 1989:257), which consequently, belongs to both unaccentable morphemes. This is shown in (i).

(i) ba-ku-ba-bon-ela
| \ /
H H

as the property of certain morphemes to cast an accent out of their morphological domain. In Sukuma, unaccentability results both from idiosyncratic properties of morphemes as well as metrification rules. The foot that hosts an unaccentable morpheme is the domain a high tone is excluded from. In Kikuyu unaccentability is the effect of a general prohibition against having a high tone at the edge of a morpheme.

In all these cases, unaccentability indicates nothing more than the globality of tone and lexical accent. This is exactly what the constraint *DOMAIN in (13) expresses: the desire of a lexical accent or a tone to extend itself beyond its lexical affiliation and become a property of the whole morphological construction. Notice that *DOMAIN, as stated in (13), is different from Carleton and Myers's (1996) *DOMAIN in (3). The former is a general structural constraint whereas the latter is a morpheme-specific constraint. The reason for choosing the definition in (13) is that parochial constraints like *DOMAIN in (3) are language specific; there is always a different set of morphemes in each language that initiates *DOMAIN. Moreover, adopting a constraint like (3) implies that the weight of lexical specification is moved from the lexicon to the grammar. Each morpheme is associated with a specific constraint in the lexicon but this constraint must be ordered above the other constraints of the system, in order to guarantee the desired outcome. (Cf. also the discussion in §2.5.)

Before closing up this section, a parenthetical remark is needed. In the Introduction I claimed that one of the most important aspects of lexical accent systems like Greek is that the morphological organization of the word is projected onto the prosody: the lexical accent that belongs to the head element of the word prevails. Unaccentable morphemes seem to pose a problem for this claim. Unaccentable roots, for example, have an accent that is not realized within their domain. Stress surfaces on some other element of the structure, namely the inflectional suffix in the word *uran-ú* 'sky', giving the impression that it is on the non-head element. This is not quite correct, however. In this example final stress is triggered by the root/head of the word and not from the suffix /-u/ which is inherently pre-accenting. This means that the marking property of the root prevails over the marking property of the suffix. In this sense, morphological headedness is indeed reflected in the prosody. Consequently, prosody serves as a cue for morphological structure in unaccentable morphemes as well. The deviation is that in *uran-ú* the accent negatively demarcates the domain of the head constituent, by designating the beginning of the non-head.

To sum up, in this section I showed that various forms of unaccentability are attested across languages. Morphological and metrical domains (Greek, Chichewa, Sukuma) or morpheme edges (Kikuyu) are defined by means of a

tone that demarcates the borders of neighboring morphological or prosodic domains.