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I Basque

Accent, tone, and intonation in Lekeitio Basque*

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0 Introduction

The purpose of this paper is to provide an analysis of the tone structure of Lekeitio Basque, with particular reference to the organization of tones in prosodic constituents. Although in recent years there has been a rise in researchers' interest in prosodic aspects of Basque phonology, this has been reduced almost entirely to the accentuation system of different dialects (cf. Hualde 1989, 1990, 1991abc, 1992, 1993abc, 1994, to appear ab, Hualde and Sagarzazu 1991, Hualde and Bilbao 1993, Hualde, Elordieta, and Elordieta 1993, 1994, Gaminde and Hualde, to appear, and references therein). In this pilot study I focus on the intonational system of the Biscayan dialect spoken in Lekeitio, a coastal town located in northeastern Biscay. In this dialect, tones are grouped in intonational units of different levels in a prosodic hierarchy, in a fashion similar to that of Japanese (cf. Beckman and Pierrehumbert 1986, Pierrehumbert and Beckman 1988). First, there is a lexical pitch accent, of the shape H^*+L , which is a property of the word level; i.e., it is assigned at the word level in the phonological representation. At a higher prosodic level, where words can be grouped, we find the accentual phrase, characterized by an initial $L\%$ boundary tone and a lexical or phrasal pitch accent (H^*+L). These accentual phrases can be grouped into higher levels of prosodic structure, which we call intermediate phrases. These are the domains where catathesis applies. A syntactic maximal projection constitutes an intermediate phrase, unless it is the leftmost phrase in the sentence, and it contains only one accentual phrase, in which case restructuring applies. Finally, there is the level of the utterance, with its initial and final $L\%$ and $H\%$ boundary tones.

The analysis proposed in this paper offers the advantage of solving, in a

principled way, empirical and theoretical problems that previous studies faced concerning the distribution of L and H tones not associated with pitch accents at the word level. The explanatory account we suggest avoids having to make recourse to extratonicity and bidirectionality in the spreading of tones. At a more general level, it also provides theoretical support for a prosodic hierarchy theory of tonology, such as the one suggested by Pierrehumbert and Beckman (1988), based on Japanese.

Of course, one should bear in mind that the observations on the intonational properties of this dialect do not necessarily extend to all other dialects of Basque. This language is divided into several dialects and local varieties, with phonological, morphological, and, to a lesser extent, syntactic differences among them. A cross-dialectal survey would be necessary to determine whether there exist substantial differences in intonation properties among Basque dialects. Such a task remains one of the pending issues in Basque dialectology, from which undoubtedly important observations on the grammatical structure of Basque can be drawn. This study will thus be a first step toward understanding the main characteristics of Basque intonation.

This article is organized as follows: in section 1 I introduce the theoretical framework on which I base my analysis. In section 2 I present a discussion of the accentual system of Lekeitio Basque. Section 3 contains a discussion of the tonal patterns of words and phrases, with a criticism of past proposals to account for the facts. Section 4 is a review of the tone structure of Tokyo Japanese, as a preview to my analysis of Lekeitio Basque tone structure, presented in section 5. Section 6 deals with the prosodic constraints on focalization, and section 7 is dedicated to an analysis of the basic intonational contours of the major sentence types in Lekeitio Basque. Finally, I summarize the conclusions drawn from the paper in section 8.

1 Theoretical framework.

The theoretical framework I follow for an analysis of the data is the one developed in Pierrehumbert's (1980) dissertation, with the subsequent modifications and refinements introduced in Liberman and Pierrehumbert (1984), Beckman and Pierrehumbert (1986), and Pierrehumbert and Beckman

(1988). The main idea in the theory of intonation has three components: a well-ordered string of tones, or well-ordered string of tones, which is the unit of intonation. The grammar generates sequences of tones, which are contributed by pitch accents. The unit of intonation is the intonation phrase, which is the unit of intonation. The main component is a metrical structure. The syllables are stressed and unstressed, and the relationships in strength among them are lining up the tune with the intonation. The intonation is therefore a metrical structure in accordance with the rules of the tonal implementation, being the physical correlates of an intonation phrase are correlated with phrase accent and a boundary tone. The tones are assigned to metrically stressed syllables (i.e., H, L) or a pair of tones. The two tones are possibilities: the two tones are H and L, or they are H and L. It is phrase-final, or they are H and L. There are always two ways in which the tone falls on the accented syllable: one associated to the accent and one associated to the accent. The tone is up with the accented syllable, and the tone is immediately preceding syllable. The tones which make them up, are H and L. Such contrasts are noted on the accented syllable with H+L*, and L+H* pitch accents. The inventory of pitch accents is given in Pierrehumbert (1986).¹ In the intonation of lexical items; that is, they are given lexical items, like *feat*, they are properties of the sp

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(1988). The main idea in this approach is that the phonological characterization of intonation has three components. The first is a grammar of allowable phrasal tunes, or well-ordered strings of tone levels, in Liberman's (1975) terms. This grammar generates sequences of Low and High tones (henceforth L and H) contributed by pitch accents and tones marking the borders of the intonation phrase, which is the unit into which the text is decomposed. The second component is a metrical representation of the text, which indicates which syllables are stressed and which are unstressed, and also describes the relationships in strength among the stressed syllables. Third, there are rules for lining up the tune with the text. The complete phonological representation for intonation is therefore a metrical representation of the text with tones lined up in accordance with the rules. The surface phonetic representation, or the output of the tonal implementation rules, is the fundamental frequency (F_0) contour, F_0 being the physical correlate of pitch. As stated above, the well-formed tunes for an intonation phrase are comprised of one or more pitch accents followed by a phrase accent and a boundary tone. The pitch accents generated by the grammar are assigned to metrically strong syllables, and can consist of either a single tone (i.e., H, L) or a pair of tones (i.e., HL, LH). In the latter case, there are two possibilities: the two tones may fall on the same accented syllable, usually when it is phrase-final, or they may fall on subsequent syllables. In turn, there are always two ways in which these two tones may be realized, depending on which tone falls on the accented syllable. That is, the first of these tones could be the one associated to the accented syllable, or it could be the second tone that lines up with the accented syllable, in which case the first tone falls on an immediately preceding syllable. Thus, pitch accents can differ not only in the tones which make them up, but also in a feature controlling alignment with the text. Such contrasts are notationally referred to by marking the tone which falls on the accented syllable with a star. We could therefore have H^*+L , L^*+H , $H+L^*$, and $L+H^*$ pitch accents, in addition to the simple H^* and L^* . This is the inventory of pitch accents for English, as argued by Beckman and Pierrehumbert (1986).¹ In this language these tonal accents are not properties of lexical items; that is, they are not part of the phonological specifications for a given lexical item, like features such as [coronal] or [nasal] could be. Rather, they are properties of the specific intonation contour in which they occur. The

le, not the pitch accent) is stress-bearing lexical item ix tonally different ways, able in the grammar. y tones, which do not line he end of the intonational ccent, following Chomsky e for the raising or falling e tones, not bitonal, unlike ndary tones, which in this

ngle text in English could nts and boundary tones that elody will have a different or example, Pierrehumbert the word *Anna*, uttered in H⁻ L%; (d) L*+H L⁻ H%;) could be used as answers answer is incomplete; (d) is giving only one of many he question 'Is it Anna?'.⁴ itch accents. For example, H+L*, which, as the star he word stress. Unlike the ents in Swedish are not part available to the speaker to ne or the other accent type the individual lexical item. r specified as having H+L* d can only have this pitch ally as having H*+L accent ically contrastive, i.e., two he accent falls. nt, H*+L (cf. Beckman and

Pierrehumbert 1986, Pierrehumbert and Beckman 1988. See also Haraguchi 1977, Poser 1984 before them, within a different approach). In this language there is a contrast between accented and unaccented words, with only the first bearing the H*+L pitch accent. The difference between them is that accented words present a sharp fall in pitch from high to low on or after the accented syllable, whereas unaccented words do not present such a fall. As in Swedish, the location of the accent is lexically contrastive; for example, the words *ka'ta* 'shoulder' and *kata* 'form' differ only in which mora is accented. Unlike Swedish, however, the tonal melody borne by the accent is not lexically contrastive, as there is only one type of pitch accent, H*+L.

For the purposes that interest us in this paper, we can advance that the Western Basque dialects show only one type of pitch accent, the H*+L type, as well as a lexical difference between accented and unaccented words, as in Tokyo Japanese. Lekeitio Basque is one of the Western dialects of Basque. We will be able to see this pitch accent exemplified throughout this article.

Having sketched briefly the basic points of the theoretical perspective under which I will carry the analysis of Lekeitio Basque intonation, I will present next the accentual system of Lekeitio Basque as a preliminary to the study of its intonational system.

2 Accentuation in Lekeitio Basque

In Lekeitio Basque, as in Japanese, words can be accented or unaccented. Unaccented words receive final accentuation only in phrase-final position, otherwise they lack surface stress. Accented words have penultimate stress, triggered by accented morphemes, i.e., morphemes which are specified in the lexicon as assigners of penultimate stress on the word they are part of. These accented morphemes can be lexical roots or suffixes. Most lexical roots in the language are unaccented, accented roots being circumscribed to borrowings from Latin or Spanish and a few native roots. In (1) below we provide examples of unaccented roots, and in (2) some accented roots are illustrated, with the examples in (2a) representing borrowings and those in (2b) representing native roots. For ease of exposition, I have included syllable boundaries in the accented roots by using the dot notation⁵:

- (1)
- | | | | |
|----------------|------------|----------------|----------|
| <i>ama</i> | 'mother' | <i>erloizo</i> | 'watch' |
| <i>txakur</i> | 'dog' | <i>euli</i> | 'fly' |
| <i>itxurri</i> | 'fountain' | <i>ardi</i> | 'sheep' |
| <i>lagun</i> | 'friend' | <i>abade</i> | 'priest' |
| <i>etxe</i> | 'house' | | |
- (2) a.
- | | |
|---|-------------|
| <i>pre.si.dén.te</i> (< Sp. <i>presidente</i>) | 'president' |
| <i>ben.tá.na</i> (< Sp. <i>ventana</i>) | 'window' |
| <i>ar.bó.la</i> (< Sp. <i>árbol</i>) | 'tree' |
| <i>ma.kí.ña</i> (< Sp. <i>máquina</i>) | 'machine' |
| <i>bo.li.grá.fo</i> (< Sp. <i>bolígrafo</i>) | 'pen' |
| <i>lé.ku</i> (< Lat. <i>locus</i>) | 'place' |
- b.
- | | | | |
|-------------------|-----------|------------------|------------------|
| <i>len.gú.su</i> | 'cousin' | <i>á.u.rre</i> | 'front' |
| <i>ín.txaur</i> | 'walnut' | <i>é.gi</i> | 'truth' |
| <i>á.tze</i> | 'back' | <i>bés.te</i> | 'other' |
| <i>be.lá.rrri</i> | 'ear' | <i>bá.so</i> | 'drinking glass' |
| <i>o.llás.ko</i> | 'chicken' | <i>bas.ká.ri</i> | 'lunch' |

- (3) Indefinite
- | | |
|----------|-------------------|
| ABS | <i>sa.gar</i> |
| ERG | <i>sa.ga.rre.</i> |
| DAT | <i>sa.ga.rre.</i> |
| GEN | <i>sa.ga.rre.</i> |
| BEN | <i>sa.ga.rre.</i> |
| COM/INST | <i>sa.ga.rre.</i> |
| INES | <i>sa.ga.rre.</i> |
| ALL | <i>sa.ga.rre.</i> |
| ABL | <i>sa.ga.rre.</i> |
| GEN-LOC | <i>sa.ga.rre.</i> |

The comitative/instrumental accented suffixes; one belongs to themselves, and another representation for the comitative instance, would be /saga sagárratatik is /sagarr-'ata accented morpheme that de syllable. This is better illustrated if more suffixes are accented. The root *léku* 'place' in (4), the effects of the other suffixes underlyingly specified to be

2.1 Stress in accented words

The accentual system of Lekeitio Basque presents an interesting difference from other Western Basque dialects. In dialects such as Gernika or Getxo, accentual prominence is assigned to the syllable immediately preceding the one where the first accented suffix of the word is included or to a lexically specified syllable of an accented root (cf. Hualde 1989, 1990, 1991a, Hualde and Bilbao 1993). The paradigm in (3) belongs to the unaccented root *sagar* 'apple' in the Gernika dialect, to which several inflectional suffixes are added. From this paradigm it can be seen that the plural morphemes /-'ak/ and /-'ata/, the comitative/instrumental /-'gas/ and the ablative /-'tik/ are accented morphemes (which Hualde calls 'preaccenting').⁶ That is, they assign stress to the syllable immediately preceding the one in which they are included (taken from Hualde, to appear):⁷

- (4) Indefinite
- | | |
|-----|------------------|
| ABS | <i>lé.ku</i> |
| ERG | <i>lé.kuk</i> |
| DAT | <i>lé.ku.ri</i> |
| GEN | <i>lé.kun</i> |
| ALL | <i>lé.ku.te.</i> |
| ABL | <i>lé.ku.te.</i> |

	(3)	Indefinite	Singular	Plural
'watch'	ABS	<i>sa.gar</i>	<i>sa.ga.rra</i>	<i>sa.gá.rrak</i>
'fly'	ERG	<i>sa.ga.rrek</i>	<i>sa.ga.rrak</i>	<i>sa.gá.rrak</i>
'sheep'	DAT	<i>sa.ga.rre.ri</i>	<i>sa.ga.rra.ri</i>	<i>sa.gá.rra.ri</i>
'priest'	GEN	<i>sa.ga.rren</i>	<i>sa.ga.rran</i>	<i>sa.gá.rran</i>
	BEN	<i>sa.ga.rren.tza.ko</i>	<i>sa.ga.rran.tza.ko</i>	<i>sa.gá.rran.tza.ko</i>
	COM/INST	<i>sa.ga.rré.gas</i>	<i>sa.ga.rrá.gas</i>	<i>sa.gá.rra.kas</i>
'president'	INES	<i>sa.ga.rre.tan</i>	<i>sa.ga.rran</i>	<i>sa.gá.rra.tan</i>
'window'	ALL	<i>sa.ga.rre.ta.ra</i>	<i>sa.ga.rre.ra</i>	<i>sa.gá.rra.ta.ra</i>
'tree'	ABL	<i>sa.ga.rre.tá.tik</i>	<i>sa.ga.rré.tik</i>	<i>sa.gá.rra.ta.tik</i>
'machine'	GEN-LOC	<i>sa.ga.rre.ta.ko</i>	<i>sa.ga.rre.ko</i>	<i>sa.gá.rra.ta.ko</i>
'pen'				
'place'				

<i>re</i>	'front'
	'truth'
<i>te</i>	'other'
<i>so</i>	'drinking glass'
<i>ká.ri</i>	'lunch'

sents an interesting difference such as Gernika or Getxo, immediately preceding the one ded or to a lexically specified O, 1991a, Hualde and Bilbao nted root *sagar* 'apple' in the ffixes are added. From this emes /-'ak/ and /-'ata/, the 'tik/ are accented morphemes y assign stress to the syllable ncluded (taken from Hualde,

The comitative/instrumental plural and the ablative plural carry two lexical accents; one belongs to the comitative/instrumental and ablative suffixes themselves, and another belongs to the plural morpheme. The underlying representation for the comitative/instrumental plural form *sagárrakas*, for instance, would be /sagarr-'ak-'gas/, and the one for the ablative plural *sagárratitik* is /sagarr-'ata-'tik/. These examples show that it is the leftmost accented morpheme that determines the location of the prosodically prominent syllable. This is better illustrated by a form in which the lexical root and one or more suffixes are accented. As seen in the inflectional paradigm for the accented root *léku* 'place' in (4), the accent carried by the lexical root eliminates the effects of the other suffixes; all the forms will surface with stress on the syllable underlyingly specified to bear the accent, i.e., *lé*:

(4)	Indefinite	Singular	Plural
ABS	<i>lé.ku</i>	<i>lé.ku.e</i>	<i>lé.ku.ek</i>
ERG	<i>lé.kuk</i>	<i>lé.ku.ek</i>	<i>lé.ku.ek</i>
DAT	<i>lé.ku.ri</i>	<i>lé.ku.e.ri</i>	<i>lé.ku.e.ri</i>
GEN	<i>lé.kun</i>	<i>lé.ku.en</i>	<i>lé.ku.en</i>
ALL	<i>lé.ku.te.ra</i>	<i>lé.ku.re</i>	<i>lé.ku.e.ta.ra</i>
ABL	<i>lé.ku.te.tik</i>	<i>lé.ku.tik</i>	<i>lé.ku.e.ta.tik</i>

In Lekeitio Basque, however, when a word contains an accented morpheme, be it a root or a suffix, the penultimate syllable is always assigned the word stress. Consequently, irrespective of the position in which the accented morpheme occurs in the word, and irrespective of the number of accented morphemes contained in the word, the penultimate syllable is invariably the most prominent syllable prosodically. Thus, an accent which lexically belongs to a given morpheme in a word may appear many syllables away from it, to the right. The inflectional paradigm for the root *sagar* 'apple' in the dialect of Lekeitio is included in (5), which can be compared to the one in (3) for the Gernika dialect:⁸

(5)	Indefinite	Singular	Plural
ABS	<i>sa.ga.r</i>	<i>sa.ga.rra</i>	<i>sa.gá.rrak</i>
ERG	<i>sa.ga.r</i>	<i>sa.ga.rra</i>	<i>sa.gá.rrak</i>
DAT	<i>sa.ga.rre.ri</i>	<i>sa.ga.rra.ri</i>	<i>sa.ga.rrá.ri</i>
GEN	<i>sa.ga.rren</i>	<i>sa.ga.rren</i>	<i>sa.gá.rren</i>
BEN	<i>sa.ga.rren.tza.ko</i>	<i>sa.ga.rren.tza.ko</i>	<i>sa.ga.rren.tzá.ko</i>
COM/INST	<i>sa.ga.rré.gas</i>	<i>sa.ga.rrá.gas</i>	<i>sa.ga.rrá.kiñ</i>
INES	<i>sa.ga.rre.tan</i>	<i>sa.ga.rri.an</i>	<i>sa.ga.rré.tan</i>
ALL	<i>sa.ga.rre.ta.ra</i>	<i>sa.ga.rre.ra</i>	<i>sa.ga.rre.tá.ra</i>
ABL	<i>sa.ga.rré.tik</i>	<i>sa.ga.rré.tik</i>	<i>sa.ga.rre.tá.tik</i>
GEN-LOC	<i>sa.ga.rre.ta.ko</i>	<i>sa.ga.rre.ko</i>	<i>sa.ga.rre.tá.ko</i>

As shown, all accents introduced by lexically accented suffixes (the comitative/instrumental, the ablative and all plural affixes) are realized on the penultimate syllable of the word. The peculiarity of this accentual system is best observed in cases where we find an accented lexical root followed by unaccented suffixes; the stress falls on the penultimate syllable of the word. Let us take the inflectional paradigm of an accented root such as *léku* 'place', for the sake of comparison with the Gernika type:

(6)	Indefinite
ABS	<i>lé.ku</i>
ERG	<i>lé.kuk</i>
DAT	<i>le.kú.ri</i>
GEN	<i>lé.kun</i>
ALL	<i>le.ku.tá.ra</i>
ABL	<i>le.ku.tá.ti</i>

Derivational suffixes accented suffixes includes /-'ago/, the superlative /-'e/

We present some examples

- | (7) | |
|-----|-----------------------------|
| a. | /kale-'tarr/
street-PLAC |
| b. | /bero-'ago/
hot-COMP |
| c. | /andi-'en/
big-SUPERI |
| d. | /otz-'egi/
cold-EXCES |
| e. | /egun-'ro/
day-FREQ |

If we add unaccented unaccented root and an acc similar to the one observed syllable of the word will inv accented morpheme occurs e with the place-adjective form (8b)):

is an accented morpheme, always assigned the word in which the accented syllable is invariably the one which lexically belongs to the one in (3) for the

(6)	Indefinite	Singular	Plural
ABS	<i>lé.ku</i>	<i>le.kú.a</i>	<i>le.kú.ak</i>
ERG	<i>lé.kuk</i>	<i>le.kú.ak</i>	<i>le.kú.ak</i>
DAT	<i>le.kú.ri</i>	<i>le.ku.á.ri</i>	<i>le.ku.á.ri</i>
GEN	<i>lé.kun</i>	<i>le.kú.en</i>	<i>le.kú.en</i>
ALL	<i>le.ku.tá.ra/le.kú.ra</i>	<i>le.kú.ra</i>	<i>le.ku.e.tá.ra</i>
ABL	<i>le.ku.tá.tik/le.kú.tik</i>	<i>le.kú.tik</i>	<i>le.ku.e.tá.tik</i>

Derivational suffixes can also be accented or unaccented. The set of accented suffixes includes the place-adjective forming /-'tarr/, the comparative /-'ago/, the superlative /-'en/, the excessive /-'egi/, and the frequentative /-'ro/. We present some examples in (7):⁹

Plural
sa.gá.rrak
sa.gá.rrak
sa.ga.rrá.ri
sa.gá.rren
a.ko sa.ga.rren.tzá.ko
sa.ga.rrá.kiñ
sa.ga.rré.tan
sa.ga.rre.tá.ra
sa.ga.rre.tá.tik
sa.ga.rre.tá.ko

(7)	a.	/kale-'tarr/	<i>kalétar</i>	'town dweller'
		street-PLAC		
	b.	/bero-'ago/	<i>beruágo</i>	'hotter'
		hot-COMP		
	c.	/andi-'en/	<i>andižen</i>	'biggest'
		big-SUPERL		
	d.	/otz-'egi/	<i>otzégi</i>	'too cold'
		cold-EXCESS		
	e.	/egun-'ro/	<i>egunéro</i>	'everyday'
		day-FREQ		

ly accented suffixes (the affixes) are realized on the this accentual system is best root followed by unaccented of the word. Let us take the *éku* 'place', for the sake of

If we add unaccented inflectional suffixes to the complex formed by an unaccented root and an accented derivational morpheme, we obtain a pattern similar to the one observed for accented roots in (6); that is, the penultimate syllable of the word will invariably be the most prominent one, even though the accented morpheme occurs earlier in the word. We provide two examples in (8), with the place-adjective forming /-'tar/ (cf. (8a)) and the diminutive /-'txu/ (cf. (8b)):

- (8) a. /markina-'arr-en-a-ri/ → mar.ki.ña.rre.ná.ri (*markiñarrenári*)
 Markina-PLAC-GEN-DET SG-DAT
 'to the one of the native from Markina (town name)'
- b. /neska-'txu-a-gana/ → nes.ka.txu.a.gá.na (*neskatxuagána*)
 girl-DIM-DET SG-ALL
 'toward the little girl'

Compounds also receive penultimate accent, even though the members of the compound in isolation are unaccented roots. Let us compare, then, the accentuation illustrated in (9a) for the compound adjective *buru-gógor* 'stubborn' with that in (9b), corresponding to the nouns *buru* 'head' and *gogor* 'hard' in a non-compound sequence:¹⁰

- (9) a. *buru-gógor* 'stubborn'
 b. *buru gogor* 'hard head'

As Hualde (to appear) notes, this prosodic pattern is unique to this dialect, and it does not have any parallel in any other language of Europe. On the other hand, some Bantu languages such as Digo (Kisseberth 1984) present phenomena of tone displacement, whereby a high tone which lexically belongs to a given morpheme may be attracted to a certain position which does not necessarily coincide with the lexically tone-bearing morpheme. Hualde (1991a) analyzes these facts metrically, and argues that accented morphemes have the property of making the final syllable in the word extrametrical, i.e., invisible to the stress assignment rules. I follow Hualde (1991a) in proposing that metrical rules for this dialect must include a rule which makes the final syllable extrametrical, in the presence of an accented morpheme in the word. Thus, we could suggest that the rules for assigning prosodic prominence to accented words in Lekeitio Basque are organized as follows:

- (10) a. Line 0 element
 b. Mark the final
 c. On line 0, const
 mark its head o
 d. On line 1, const
 mark its head o

The way these rules work
 'from the mountains', which c
 determiner /-'eta/ (used for l
 represented in the underlying re

- (11) /mendi-'eta-'tik/
 mountain-DET PL-

- (12) Line 2
 Line 1 (
 Line 0 (*
 men

2.2 Stress in unaccented words

As already mentioned at the
 not receive word-level stress un
 more precisely, if they are the las
 the verb. Thus, unaccented wo
 stress, not word stress, realized
 in (13) will serve to illustrate thi

- (13) *su.re e.rriko al.*
 your town-of ma
 'I have seen the may

In this example, the phrase *sure erriko alkatia* 'the mayor of your town' is composed of unaccented words. Of these, only the unaccented word located immediately before the verb gets prosodic prominence, which is realized tonally on the last syllable by means of the phrasal accent H*+L, as we will see in more detail in the following section. The other unaccented words do not receive any prosodic prominence, all syllables carrying a H tone except for the first syllable in the phrase, which carries a L tone (see sections 3.3 and 5.1 for a discussion on this matter).

The specification that phrasal stress is realized only in phrases which immediately precede the verb is crucial, because topics, which arguably also constitute syntactic and phonological phrases, do not show phrasal stress. If the last word in a topic is unaccented, it will surface only with a H tone on all syllables except the first, which will surface with a L tone (cf. sections 3.3 and 4.2). This is exemplified below, with the unaccented word *alkatia* 'the mayor' ending a topic phrase:

- (14)
- | | | | | | | | | | |
|----|----|---|---|----|----|----|----|----|--------|
| L | H | H | H | H | H | H | H | H | H |
| | | | | | | | | | |
| Su | re | e | r | ri | ko | al | ka | ti | a, ... |
- 'The mayor of your town, ...'

The accentual behavior of unaccented words means that there is an algorithm in the grammar of Lekeitio Basque that determines the location of phrase-level prosodic prominence. By this rule or algorithm, the syntactic element immediately preceding the verb receives the main sentence stress. This rule is provisionally stated in (15):

- (15) In a sentence S, mark the terminal element X immediately preceding V (i.e., the verb) as the most prosodically prominent element in S.

This algorithm applies at the output of the overt syntactic component, after the linguistic derivation has been sent as input to the (postlexical) phonological

component of the grammar, minimalist framework as SP 1994, 1995). A discussion of this prosodic computation we and thus for reasons of limited depth study of this matter for Chomsky and Halle 1968, Halle 1994).

3 Tonal properties of Basque

3.1 Lexical H*+L pitch accent

As we already mentioned, the pitch accent is realized by tonal means, that is, on the accented syllable.¹¹ This property is characteristic of an accent language, i.e., a language with an underlying tone. As in Japanese, the pitch accent in Basque is realized by a sharp drop. The high tone is realized on the accented syllable, and the low tone falls on the following syllable. Poser (1984) in assuming that the pitch accent in Basque is on Pierrehumbert and Beckman's (1988) H*+L tone, propose that the accent in Lekeitio Basque is realized by this tone. This tone is carried lexically, that is, by association lines from the tone to the syllable. This tone of prominence in the word by the pitch accent can be represented as in (17), for example, 'the book', a word that contains a pitch accent. An underlying representation of

- (16) /'liburu-a/
book-DET SG

the mayor of your town' is
 an unaccented word located
 in a phrase, which is realized tonally
 with H*+L, as we will see in
 the next section. Unaccented words do not receive
 a H tone except for the first
 section 3.3 and 5.1 for a

found only in phrases which
 are topics, which arguably also
 do not show phrasal stress. If the
 word is only with a H tone on all
 syllables (cf. sections 3.3 and
 5.1) and the word *alkatia* 'the mayor'

[H
 |
 ... a, ...

... means that there is an
 algorithm that determines the location of
 the main sentence stress. This

...ent X immediately
 most prosodically

... syntactic component, after
 the (postlexical) phonological

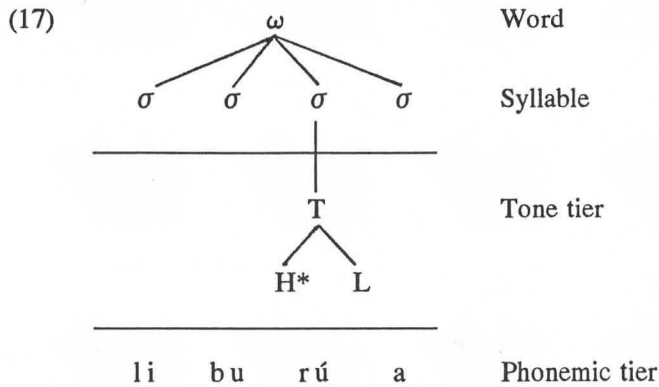
component of the grammar, i.e., after the operation known in the current
 minimalist framework as SPELL-OUT has taken place (cf. Chomsky 1993,
 1994, 1995). A discussion of the nature of the grammatical principle governing
 this prosodic computation would take us too far from our focus in this paper,
 and thus for reasons of limited space and scope we will have to leave an in-
 depth study of this matter for future research (for discussion and references, see
 Chomsky and Halle 1968, Halle and Vergnaud 1987, Cinque 1993, Elordieta
 1994).

3 Tonal properties of Basque accent

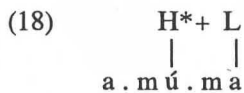
3.1 Lexical H*+L pitch accent

As we already mentioned in section 1, accentual prominence in *Lekeitio* is
 realized by tonal means, that is, by assigning a H*+L pitch accent to the
 accented syllable.¹¹ This property by itself classifies this language as a pitch-
 accent language, i.e., a language in which accent is always associated to an
 underlying tone. As in Japanese, H*+L is the only type of pitch accent used by
 the language. Acoustically, this accent is reflected by a rise in pitch, followed
 by a sharp drop. The high tone is associated to the accented syllable, and the
 low tone falls on the following syllable. We will follow Pulleyblank (1983) and
 Poser (1984) in assuming that accents are lexically associated tones, and based
 on Pierrehumbert and Beckman's (1988) analysis of Japanese accent, we will
 propose that the accent in *Lekeitio Basque* is an underlying H*+L complex tone.
 This tone is carried lexically by an accented morpheme, and linked by
 association lines from the tone tier onto the syllable determined to bear the main
 prominence in the word by the stress assignment rules stated in (10).¹² This
 can be represented as in (17), which reflects the prosodic structure of *liburúa*
 'the book', a word that contains the accented lexical root /'liburu/. We provide
 an underlying representation of this word in (16):

- (16) /'liburu-a/
 book-DET SG

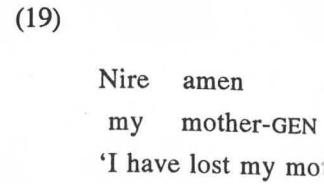


Phonetically, however, the H^*+L tone assigned to the penultimate syllable spans the last two syllables in its realization. As mentioned above, the H tone reaches its peak on the penultimate syllable, and the pitch lowering corresponding to the L tone starts already at the end of the accented syllable. This detail is illustrated in Figure 1 (see Appendix below), for the word *amúma* 'grandmother', whose phonological representation is given in (18):¹³



3.2 Tonal pattern of phrase-final stress

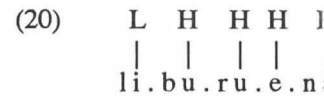
As already discussed in section 2.2, unaccented words also have a H^*+L tonal contour when they receive prosodic prominence, that is, when they are uttered in isolation or are located in final position of a phrase immediately preceding the verb. The contrast with respect to accented words is that in unaccented words the contour is realized on the final syllable. Thus, in (19) below, where the phrase *nire amen dirua* 'my mother's money' is composed entirely of unaccented words, the main stress in the phrase falls on the word *dirua* 'the money', located in final position of the phrase. The tonal implementation of this phrasal stress is H^*+L , and is realized on the last syllable of *dirua*. The last syllable thus presents a sharp drop in pitch (cf. Figure 2):



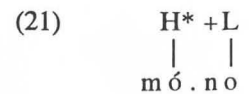
If an accented word is phrasally stressed, its pitch is determined by the location of the main stress in the phrase when the last word in the phrase is accented. This is illustrated in the word *dirua* above.

3.3 Tone spreading and tone

So far we have discussed the tonal implementation of phrase-final stress. We have not discussed the tonal implementation of the initial syllable in a phrase. This is illustrated by the word *liburúena* below (cf. Azkue 1923, 1931; and Lekeitio Basque, and Hualde



If the accented word is bilabial, the initial syllable receives a L tone, the pitch lowering is realized on the penultimate syllable. This kind of tone is called 'monkey' (cf. Figure 4):¹⁴



- (19)
- | | | | | | |
|---------------------------------|------------|---------|-------|----------|--|
| | | | H*+L | | |
| | | | / | | |
| Nire | amen | di.ru.a | galdu | dot | |
| my | mother-GEN | money | lose | have-1SG | |
| ‘I have lost my mother’s money’ | | | | | |

If an accented word is phrase-final, then the location of phrasal stress is determined by the location of the word stress; that is, the phrase-level stress when the last word in the phrase is accented falls on the penultimate syllable of the word.

3.3 Tone spreading and tone insertion

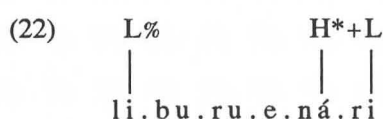
So far we have discussed the tonal features of stress in Lekeitio Basque, but we have not discussed the tonal specifications of the unstressed syllables to the left of the stressed syllable in a word. Of these, the initial syllable receives a L tone, and the rest of the syllables, up to the stressed one, surface with a H tone. This is illustrated by the word *liburuenári* ‘to the one of the book’ and Figure 3 below (cf. Azkue 1923, 1931, 1932 for a first description of the tonal pattern of Lekeitio Basque, and Hualde 1989 for an autosegmental analysis):

- (20)
- | | | | | |
|----|----|----|---|-------|
| L | H | H | H | H*+L |
| | | | | / |
| li | bu | ru | e | ná.ri |

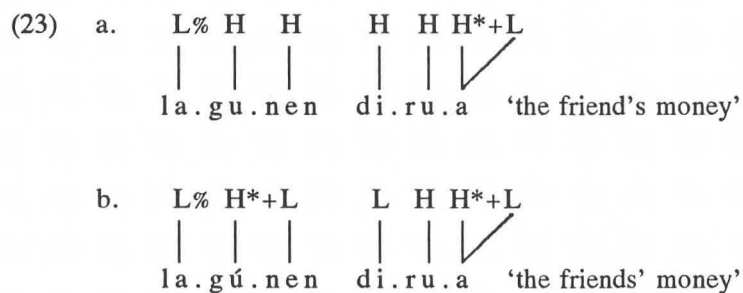
If the accented word is bisyllabic, and the first syllable is consequently stressed, the initial syllable receives a H tone and the second syllable receives a L tone, the pitch lowering having already started at the end of the initial syllable. This kind of tone assignment is exemplified by the word *móno* ‘monkey’ (cf. Figure 4):¹⁴

- (21)
- | | |
|------|-------|
| H*+L | |
| | |
| m ó | . n o |

Hualde (1991a) adopts an underspecification theory approach in order to explain this tonal pattern, suggesting that only syllables which are assigned lexical pitch accents by the metrical rules in (10) are tonally specified. All other syllables on which no lexical accent falls are tonally underspecified. He proposes analyzing the tonal implementation on underlyingly underspecified syllables as a process of leftward spreading of the H tone of the accented syllable up to the initial syllable. This syllable receives the L tone by virtue of the phonetic realization of an initial L% boundary tone if the word occurs at the beginning of an intonational phrase (cf. Pierrehumbert 1980, Pierrehumbert and Beckman 1988, on boundary tones). The following representation for the word *liburuenári* (cf. (20)) would serve to illustrate this:



Although I agree with Hualde's H tone leftward-spreading analysis, there is a call for clarification regarding the proposal on the initial L% boundary tone. We have to account for the two tonal patterns observed for initial syllables of words within an intonational phrase. Words can surface with a L tone or a H tone on their initial syllables, as illustrated by the two examples in (23), which contrast minimally in the number specification of the genitive phrases *lagunen* 'of the friend' and *lagúnen* 'of the friends' (see Figures 5 and 6, respectively):



Hualde tries to account for a floating L tone deletion in why initial syllables follow a L tone (cf. (23b)). In the initial syllable of words, an initially-accented bisyllable receives a default L tone combined interpretation. It is argued that the initial syllable of a word will receive a L or H tone. If the syllable begins an intonational phrase by a rule of default tone specification as default tones). It is whether it receives a L tone from the preceding syllable.

With this in mind, the process of leftward spreading of a tone on an unaccented, which leaves the initial syllable in an utterance-initial position associated to an utterance-initial syllable will surface with a tone from the preceding syllable, i.e., the initial syllable has a L tone, it will surface with a H tone, it will surface with a H tone. In the analysis of rightward spreading of a tone from a preceding syllable of a word onto it, this analysis. In (24) *lagunen* in an utterance (note also the tone of the phrase final, much like the tone of the phrase-internally, and surface with a tone from the preceding syllable, that is, a L tone and H in (25b) (in these cases, the tone indicates extratonicity):

theory approach in order to syllables which are assigned tonally specified. All other tonally underspecified. He underlyingly underspecified the H tone of the accented receives the L tone by virtue of one if the word occurs at the bert 1980, Pierrehumbert and representation for the word

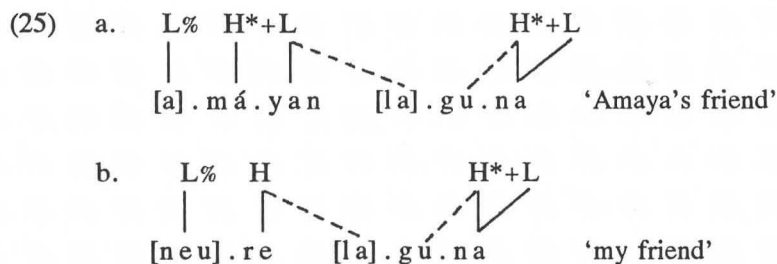
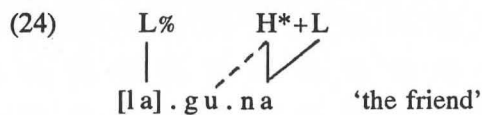
rd-spreading analysis, there the initial L% boundary tone. served for initial syllables of surface with a L tone or a H two examples in (23), which the genitive phrases *lagunen* figures 5 and 6, respectively):

friend's money'

riends' money'

Hualde tries to account for the initial H tone on *dirua* in (23a) by positing a floating L tone deletion between two H tones. However, he does not explain why initial syllables following a word-final syllable with a L tone surface with a L tone (cf. (23b)). In earlier articles, Hualde (1986, 1989) suggests that the initial syllable of words in Western Basque dialects is extratonal (except for initially-accented bisyllabic words, such as the one in (21) above), and that it receives a default L tone by insertion at the end of the derivation. To make a combined interpretation of Hualde's (1986, 1989, 1991a) analyses, it would be argued that the initial syllable in an unaccented word or a trisyllabic accented word will receive a L or a H tone depending on the context in which it occurs. If the syllable begins an intonational phrase, as in (22), it is assigned a L tone by a rule of default tone insertion (cf. Pulleyblank 1983 for evidence on low tones as default tones). If the syllable is located within an intonational phrase, whether it receives a L or H tone will depend on the tonal nature of the preceding syllable.

With this in mind, we might propose that in Lekeitio Basque there is a process of leftward spreading of the accented H tone in a word, be it accented or unaccented, which leaves the initial syllable intact because of its extratonicity. In utterance-initial position, this syllable receives a default L tone, or is associated to an utterance-initial L% boundary tone. Within an utterance, this syllable will surface with a L or a H tone depending on the tonal nature of the preceding syllable, i.e., the last syllable of the preceding word. If the preceding syllable has a L tone, it will surface with a L tone. If the preceding syllable has a H tone, it will surface with a H tone. This pattern could be amenable to an analysis of rightward spreading of the tone of the syllable preceding the initial syllable of a word onto it. We will use the word *laguna* 'the friend' to illustrate this analysis. In (24) *laguna* is uttered in isolation, and is thus the initial word in an utterance (note also the H*+L pitch accent it receives by virtue of being phrase final, much like the phrase-final syllables in (25)). In (25) it appears phrase-internally, and surfaces with the tone corresponding to the immediately preceding syllable, that is, the last syllable of the preceding word: L in (25a), and H in (25b) (in these and subsequent examples, square brackets are used to indicate extratonicity):



Although this analysis appears to account for the assignment of tones in Western Basque, we have to point out its *ad-hoc* flavor regarding the directionality of tone spreading. On the one hand, we have to posit a process of leftward spreading of the accented H which excludes the extratonal initial syllable, and on the other hand we have to posit a later process of rightward spreading by which the initial syllable acquires the tone of the preceding syllable. Moreover, we have to propose two stages in the derivation: one in which the initial syllable of a word is extratonal, where leftward H tone spreading applies, and a second one in which the initial syllable loses its extratonicity, a stage at which rightward tonal spreading takes place. Clearly, an analysis which posits a single direction of spreading and a single stage in the derivation would be simpler, and thus more elegant and appealing. The alternative analysis that I will propose in this paper does not have to make recourse to bidirectionality, and thus it constitutes substantial progress in accounting for the tonal realization of the syllables not associated with lexical pitch accents. The analysis will be based on the organization of tones in Lekeitio Basque.

I want to propose that the distribution and phonological implementation of tones in Lekeitio Basque are not only a property of words, but also of prosodic phrases. The H and L tones of a H*+L lexical pitch accent are a property of the word because of their lexical association to it, aligning with the penultimate syllable. The H and L tones surfacing in other syllables belong to higher

intonational phrases and syllables), although they will assume that all syllables H*+L are phonologically identify tones that belong to prosodic phrases. I want to phrases, with pitch accent boundaries. This hypothesis tone structure of Japanese d Pierrehumbert and Beckma we will therefore review th

4 The tone structure of

In the studies of Japa Pierrehumbert (1986) and F units or constituents are d prosodic tree (cf. Nespor a tree corresponds to a partic word, and higher domains o the intermediate phrase, Pierrehumbert and Beckma linked to this structure, not the prosodic tree, such as t also to any higher-level no floating tones, but rather t constituent in the prosodic l above the word level, altho word.

4.1 The accentual phrase

The lowest level of pro pattern is the *accentual phr* also used by later researcher

intonational phrases and not to the minimal tone-bearing units (i.e., the syllables), although they are realized phonologically on them. With Hualde, I will assume that all syllables except the ones associated to lexical pitch accents H^*+L are phonologically underspecified for tone at the word level. We can then identify tones that belong to higher prosodic constituents than the word, i.e., prosodic phrases. I want to suggest that the utterance is divided in several tonal phrases, with pitch accent tones or intermediate phrase tones delimiting their boundaries. This hypothesis is based in great part on the ideas regarding the tone structure of Japanese developed by Beckman and Pierrehumbert (1986) and Pierrehumbert and Beckman (1988), more concretely on the Tokyo dialect, and we will therefore review these in the following section.

4 The tone structure of Tokyo Japanese

In the studies of Japanese intonational structure made by Beckman and Pierrehumbert (1986) and Pierrehumbert and Beckman (1988), several prosodic units or constituents are distinguished, organized hierarchically in an n -ary prosodic tree (cf. Nespor and Vogel 1986, Beckman 1986). Each level in the tree corresponds to a particular prosodic unit, such as the mora, the syllable, the word, and higher domains of intonational phrasing, such as the accentual phrase, the intermediate phrase, and the utterance. The main innovation in Pierrehumbert and Beckman's (1988) work is that tones are autosegmentally linked to this structure, not only to minimal tone-bearing units at the bottom of the prosodic tree, such as the mora or the syllable (cf. Goldsmith 1976), but also to any higher-level node. Thus, boundary tones are not considered to be floating tones, but rather tones which are linked or associated with a specific constituent in the prosodic hierarchy or level in the phonological representation above the word level, although they are realized on a mora or syllable of a word.

4.1 The accentual phrase

The lowest level of prosodic phrasing that is well defined by the intonation pattern is the *accentual phrase* (McCawley 1968 used the term *minor phrase*, also used by later researchers such as Poser 1984 and Selkirk and Tateishi 1988,

H^*+L

'Amaya's friend'

'my friend'

r the assignment of tones in
d-hoc flavor regarding the
 we have to posit a process of
 cludes the extratonal initial
 a later process of rightward
 the tone of the preceding
 ges in the derivation: one in
 al, where leftward H tone
 the initial syllable loses its
 reading takes place. Clearly,
 ding and a single stage in the
 elegant and appealing. The
 per does not have to make
 utes substantial progress in
 s not associated with lexical
 anization of tones in Lekeitio

onological implementation of
 f words, but also of prosodic
 n accent are a property of the
 ligning with the penultimate
 syllables belong to higher

among others). The defining mark of the accentual phrase is the presence of two delimitative tones whose occurrence is determined solely by the prosodic phrase structure of the utterance. One of these delimitative tones is a high tone, the *phrasal H*. The phrasal H is phonologically associated to the second sonorant mora of the accentual phrase unless the first mora is accented or the first syllable is long and contains two sonorant moras. The other delimitative tone is a L% boundary tone that occurs at the beginning of every utterance and at the end of every accentual phrase. By a phonological rule, however, the L% boundary tone is realized on the initial mora of the following accentual phrase. If the first mora is accented, that is, if it carries a lexical H*+L pitch accent, then the L% boundary tone is realized at the periphery of the accentual phrase, giving rise to a *weak* L% boundary tone which is hardly perceptible. This phonological association of the L% boundary tone is what led several researchers to believe that the L% boundary tone belonged to the beginning of an accentual phrase rather than to its end (cf. Poser 1984, among others). The reasons that the L% boundary tone has to be taken as a property of the preceding accentual phrase are discussed in Pierrehumbert and Beckman (1988), and they have to do with local prominence and the application of catathesis (similar to the process called 'downstep' of African tone languages). The L% boundary tone and the phrasal H together produce a rising pitch shape which marks the beginning of every new accentual phrase.

Pitch accents are not necessary to an accentual phrase. Thus, there can be accentual phrases which are composed of unaccented words, but there can be a maximum of only one pitch accent phonetically per accentual phrase. In an accentual phrase which includes two lexically accented words, the second one must be deleted. That is, in Japanese any accent is culminative to its phrase by the deletion of all subsequent accents. Moreover, the accentual H* tone normally has greater tonal prominence than the phrasal H.

Another important observation by Pierrehumbert and Beckman is that the phrasal H and the L% boundary tone are the only tones that exist in the phonological representation of accentual phrases in Tokyo Japanese. The moras not associated to these tones are phonologically underspecified for tone even at the most surface level. The F₀ patterns at places not occupied by these tones are interpreted to arise from the phonetic transitions between the assigned target values for these tones.

4.2 The intermediate phrase

In Japanese, accentual *intermediate phrase* (origin which Poser 1984 and S intermediate phrase can hardly seldom contains more than glottalization, although in t and the realization of the disjuncture.

The intermediate phrasal tonal implementation that sequences on the tone tier, which is a phonetic process without regard to the phon accentual H*+L tone sequence tonal prominence lowered. lowering and compressing intermediate phrase boundary catathesis is blocked or stops the accentual phrases cannot cross intonational phrases

4.3 The utterance

The utterance is the tone contains all other phrasal units. In Japanese, and in other languages raising or lowering, triggered marked by an initial L%.

The following would be sentence *Ane-no akai se'ei sweater?* proposed by Pierrehumbert and Beckman (1988):
IP = Intermediate Phrase; M = Mora; TT = tone tier

4.2 The intermediate phrase

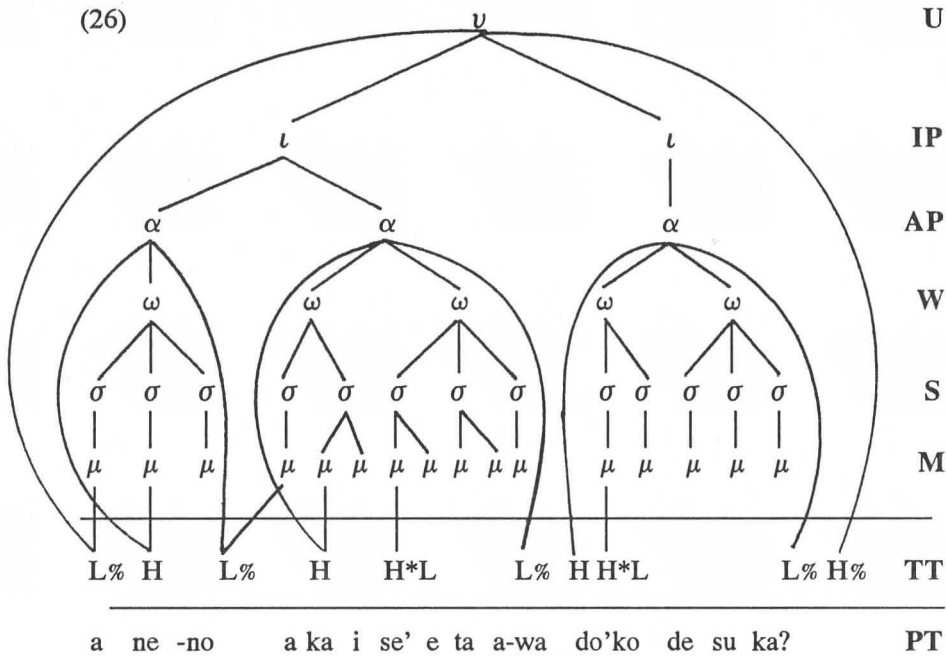
In Japanese, accentual phrases are organized into a larger unit called the *intermediate phrase* (originally called *major phrase* by McCawley 1968, term which Poser 1984 and Selkirk and Tateishi 1988, 1991 also use). The intermediate phrase can have as few as one single accentual phrase, and it seldom contains more than three. Its boundary is often marked by a pause or by glottalization, although in the absence of such signs, phrase-final lengthening and the realization of the L% boundary tone are sufficient indicators of the disjuncture.

The intermediate phrase is also the domain of catathesis, a phonetic rule of tonal implementation that reduces all tones triggered by particular tone sequences on the tone tier. Catathesis has to be distinguished from declination, which is a phonetic process of gradual backdrop or reduction of the pitch range, without regard to the phonological sequences of tones. In Japanese, after the accentual H*+L tone sequence, all subsequent tones in a domain get their mean tonal prominence lowered. That is, those bitonal accents have the property of lowering and compressing the pitch range in the region after them.¹⁵ At an intermediate phrase boundary, the pitch range is reset at a new value and catathesis is blocked or stopped. Thus, catathesis may apply within and across the accentual phrases contained in an intermediate phrase, but the process does not cross intonational phrase boundaries.

4.3 The utterance

The utterance is the topmost constituent in the prosodic hierarchy, and contains all other phrasal units, i.e., intermediate phrases and accentual phrases. In Japanese, and in other languages, it is the domain of declination and of final raising or lowering, triggered by L% and H% final boundary tones. It is also marked by an initial L%.

The following would be the surface prosodic representation for the Japanese sentence *Ane-no akai se'etaa-wa do'ko desu ka?* 'Where is big sister's red sweater?' proposed by Pierrehumbert and Beckman (1988:21) (U = Utterance; IP = Intermediate Phrase; AP = Accentual Phrase; W = Word; S = Syllable; M = Mora; TT = tone tier; PT = Phoneme tier):



As we see in (26), the tones that are realized on the minimal tone-bearing units (moras in Japanese) can correspond to lexically specified pitch accents (i.e., H*L, which we write as H*+L in this paper), or they can belong to higher levels of phrasing. The initial L% boundary tone, for example, is a property of the utterance, but is phonologically aligned with the first mora in the utterance. The H tone linked to the second mora in the first two words is the phrasal H, associated with an accentual phrase. This phrasal H does not link to the second mora in the word which begins the third accentual phrase because its initial mora is accented (i.e., *do'ko*). Another tone which belongs to a prosodic phrase but is realized on a mora is the final L% boundary tone of the first accentual phrase, which links to the first mora of the following word. The L% boundary tone of the second accentual phrase does not link to a following mora because it is accented (i.e., *do'ko*). The final L% boundary tone of the last accentual phrase and the utterance-final H% are not phonologically aligned with any mora, but are phonetically realized on the last mora of the utterance.

In the following section, I will argue that tones in Lekeitio Basque are also

organized in prosodic constituents. Previous accounts of the function of tones on syllables under

5 Lekeitio Basque tones

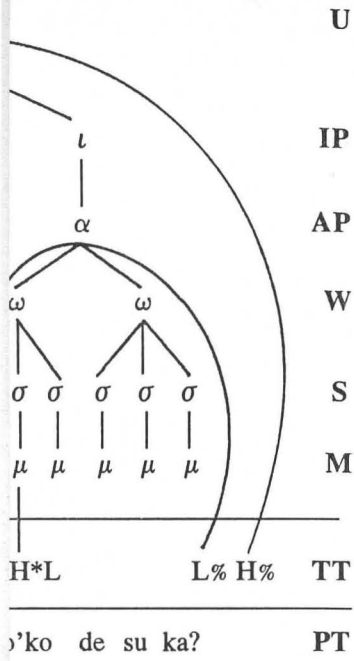
5.1 The accentual phrase

In Lekeitio Basque the lowest prosodic group is the accentual phrase. In Lekeitio Basque an initial L% boundary tone is associated to the first syllable of the word on the penultimate or the penultimate syllable if the word is accented or unaccented. Unlike Japanese, the pitch accent in the accentual phrase is the final L% boundary tone of the preceding accentual phrase.

With these characteristics, the tones are in a position to offer information about the syllables which do not receive

5.1.1 Leftward H tone

Agreeing with Hualde (1990), syllables not associated with the spreading of the accentual phrase are accented on the syllable immediately preceding the spreading. The accentual phrase with the unaccented word *lagunenári* 'to the lagunenári' phrases (cf. (27a,b), resp.



organized in prosodic constituents, as in Tokyo Japanese. Hoping to improve on previous accounts of the facts, I will also provide an analysis for the distribution of tones on syllables underspecified for tone.

5 Lekeitio Basque tone structure

5.1 The accentual phrase

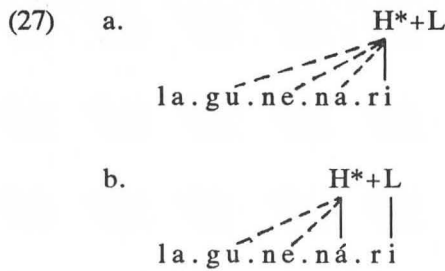
In Lekeitio Basque there is a level of phrasing which could correspond to the lowest prosodic group in Japanese: the accentual phrase. The accentual phrase in Lekeitio Basque may contain one or more words, and is marked by an initial L% boundary tone and a H*+L pitch accent. The L% boundary tone is associated to the first syllable in the phrase, and the pitch accent is realized on the penultimate or the final syllable of the word, depending on whether the word is accented or unaccented, respectively. Accentual phrases have at most one pitch accent. Unlike Japanese, the L% boundary tone linked to the first syllable in the accentual phrase belongs to the accentual phrase itself, not to the preceding accentual phrase. That is, it is an initial L% boundary tone, not a final L% boundary tone of the preceding accentual phrase.

With these characteristics of Lekeitio Basque accentual phrases in mind, we are in a position to offer an alternative solution to the distribution of tones on syllables which do not receive a pitch accent.

5.1.1 Leftward H tone spreading and association to L%

Agreeing with Hualde (1991a), I propose that the H tone appearing on syllables not associated with pitch accents comes from a process of leftward spreading of the accentual H* tone occurring on the penultimate syllable of an accented word or on the last syllable of an unaccented phrase located immediately preceding the verb. The domain where we find this H tone spreading is the accentual phrase. This is illustrated by the examples in (27), with the unaccented word *lagunenari* 'to the one of the friend' and the accented word *lagunenári* 'to the ones of the friend' forming single-word accentual phrases (cf. (27a,b), respectively):

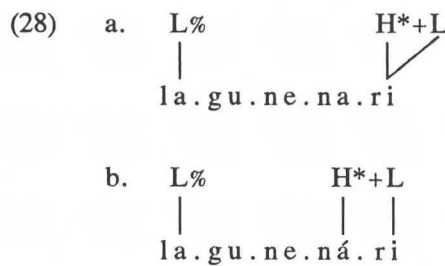
d on the minimal tone-bearing
 xically specified pitch accents
), or they can belong to higher
 , for example, is a property of
 the first mora in the utterance.
 st two words is the phrasal H,
 H does not link to the second
 tual phrase because its initial
 h belongs to a prosodic phrase
 ary tone of the first accentual
 wing word. The L% boundary
 k to a following mora because
 lary tone of the last accentual
 gically aligned with any mora,
 the utterance.
 es in Lekeitio Basque are also



The main empirical evidence in favor of positing such a process of H tone spreading comes from the observation of the H tone plateau that arises from the second syllable in an accentual phrase up to the syllable on which the pitch accent is realized. This is illustrated in Figures 7-8 (cf. also Figures 3-5).

In this respect, Lekeitio Basque differs from Tokyo Japanese. Pierrehumbert and Beckman (1988) reject leftward H tone spreading as a means of providing an interpretation for the realization of pitch in the regions between the phrasal H and the boundary L% that marks the accentual phrase boundary, because the F₀ contour in this region slopes downward and does not show the level high stretch that would be predicted by tone spreading. That is Pierrehumbert and Beckman's main motivation for positing the existence of a phrasal H tone associated to the second mora in an accentual phrase. In Lekeitio Basque the existence of a H tone plateau suggests that a process of tone spreading occurs and thus that there appears to be no need for positing a phrasal H tone on the second syllable of an accentual phrase.¹⁶

To account for the distribution of the L tone appearing on the initial syllables of certain words, we will posit that the initial L % boundary tone of an accentual phrase is associated to its first syllable. This is illustrated in (28) for the two words in (27):



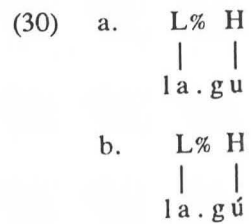
An important point is that well-formedness constraints on this issue in the following subsection.

5.1.2 Well-formedness

We mentioned earlier that in Japanese, there is a condition in an accentual phrase to the cons accentual phrase is imposed for the possibility of having them phonetically. We

(29) *Accent Condition*
An accentual phrase

Moreover, an accentual phrase. To put it roughly, an accented word. This is indicated by an initial L% boundary tone on the initial syllable of the word, indicating the existence of an accentual phrase. This is illustrated by the contour in (30) and (31b) and (31b) beginning an accentual phrase.



An important point that has to be discussed is the existence of well-formedness constraints on the formation of accentual phrases. We address this issue in the following subsection.

5.1.2 Well-formedness constraints on accentual phrase formation

We mentioned earlier the two tones that minimally distinguish an accentual phrase: the initial L% boundary tone and a pitch accent H*+L. As in Tokyo Japanese, there is a condition limiting the number of pitch accents that can occur in an accentual phrase to one. The difference from Tokyo Japanese is that in Lekeitio Basque the constraint on the number of accented morphemes in an accentual phrase is imposed on the phonological representation, without allowing for the possibility of having two pitch accents in the phrase and deaccenting one of them phonetically. We could formulate this condition as follows:

(29) *Accent Condition on Accentual Phrases*

An accentual phrase may contain at most one accented word¹⁷

Moreover, an accented word marks the right boundary for an accentual phrase. To put it roughly, an accentual phrase ends at the right edge of an accented word. This is because a L tone is observed on the syllable which begins the following word. If an accentual phrase is signaled by the presence of an initial L% boundary tone linked to its initial syllable, then the occurrence of a L tone on the initial syllable of the word following an accented word is an indication of the existence of a boundary dividing two accentual phrases. This is illustrated by the contrasting pairs of examples in (23) and (25) above, repeated here as (30) and (31), respectively. The initial syllable of the second word in (30b) and (31b) is associated to a L% boundary tone by virtue of beginning an accentual phrase:

- (30) a. L% H H H H H*+L
 | | | | | /
 l a . g u . n e n d i . r u . a 'the friend's money'
- b. L% H*+L L% H H*+L
 | | | | | /
 l a . g ú . n e n d i . r u . a 'the friends' money'

'my friend'

'Amaya's friend'

l) in Figures 9-10, showing
s in (30)).

entual phrase stated by the
l (29) is a side effect of the
says that the presence of an
of an accentual phrase. One
ation for the L and H tones
r on the initial syllables of
e on the initial syllables of
, (31a)).¹⁸ We do not have
with two directions of tone
nal and a process of H tone
ch the tone assigned to the
ward onto the initial syllable
lity.

accent of an accented word
he H*+L accent introduced
ly preceding the verb) also
want to make the suggestion
for an accentual phrase in
repeated below as (32) for
her's money' constitutes an
H*+L, realized on the last
v as Figure 11):

The L tone appearing on the initial syllable of the verb *galdu* indicates that the sequence formed by the verb and the inflected auxiliary (i.e., *galdu dot*) forms an accentual phrase on its own. That is to say, the L tone on the initial syllable of the verb *galdu* is analyzed as an initial L% boundary tone of an accentual phrase. As we can see in Figure 11, the pitch range of this phrase is radically decreased with respect to the one of previous accentual phrases, thus coming very close to the baseline. In declarative sentences in Lekeitio Basque, this pitch compression is a property of accentual phrases following the most prominent stress in the sentence; this stress is always located in the last element of the accentual phrase immediately preceding the verb.¹⁹ When more material follows the verb, it appears at the same depressed pitch range. See, for example, the contour in Figure 12 for the sentence in (33) (a phrasal pitch accent, i.e., main sentence stress, is indicated with a grave accent mark):

- (33)
- | | | | | | |
|---------|------|------|-----|---------------|--|
| | H*+L | | | | |
| | | | | | |
| eweldi | onà | emon | dau | mariñeruak | |
| weather | good | give | AUX | fisherman-ERG | |

It is worth pointing out, however, that if the verbal sequence or the postverbal material has a lexical pitch accent, it will surface with a very low peak but will nevertheless be perceptible. Thus, we cannot analyze the pitch compression in the region following the main stress in the utterance as deaccenting. For instance, in Figure 13 we see how the pitch accent of the inflected auxiliary *dábe* in (34) surfaces with a peak in the fundamental frequency contour. The pitch accent of the word *mariñerúak* 'fishermen' does not surface with a peak in the F₀ contour, but is still perceptible to the ear of native speakers. The absence of a peak can be argued to be due to a combination of pitch compression and catathesis, triggered by the preceding H*+L pitch accents (cf. next section):

- (34)
- | | | | | | | | | | |
|---------|------|------|-------|----------------|------|--|--|--|--|
| | H*+L | | H*+L | | H*+L | | | | |
| | | | | | | | | | |
| eweldi | o.nà | emon | dá.be | ma.ri.ñe.rú.ak | | | | | |
| weather | good | give | AUX | fisherman-ERG | | | | | |
- 'The fishermen have predicted good weather'

Given the radically low pitch range of the string following the most prominent syllable in the utterance, I will not indicate in this paper any tones associated to the syllables in such strings. This part of the utterance includes at least the verb phrase, although more material may follow, as has been illustrated in (33)-(34).

To summarize, we can claim that the following statement holds for accentual phrase formation in Lekeitio Basque:

- (35) A prosodic word on which a pitch accent H*+L is realized marks the right edge boundary on an accentual phrase.

There are certain conditions that have to be met in order for the L% boundary to surface. These are dictated by the accentual properties of the initial word in the phrase, where this tone is realized. If the first word in an accentual phrase is bisyllabic and accented, such as the one exemplified in (21) above, the H*+L pitch accent takes priority and the L% tone will not be realized (cf. (36a) below, which repeats (21)). Unaccented words beginning an accentual phrase could also lack an initial L% boundary tone. That would be the case for monosyllabic unaccented words which received a phrasal H*+L pitch accent, that is, the pitch accent which is assigned to the word immediately preceding the verb and which is identified as the most prominent stress in the sentence (cf. (36b) below, with a grave accent indicating phrasal pitch accent). Unaccented words with two or more syllables initiating an accentual phrase would always surface with a L% boundary tone, regardless of their position with respect to the verb:

- (36) a. $\begin{array}{c} \text{H}^* + \text{L} \\ | \quad | \\ \text{m} \acute{o} . \text{n} \text{o} \end{array}$

- b. $\begin{array}{c} \text{H}^* + \text{L} \\ \diagdown \\ \grave{\text{u}}\text{tz} \quad \text{ein} \quad \text{dau} \\ \text{miss} \quad \text{do} \quad \text{AUX} \\ \text{'(S)he has missed it' } \end{array}$

Following Pierrehumbert, I argue that the L% boundary of the utterance, but the timing of the L% boundary. To state it informally, we have already *occupied* by the pitch accent.

Summarizing, we can say that the first syllable in an accentual phrase is accented at the word level or drawn from such a restriction. That is, the realization of the L% boundary is contingent upon the realization of the pitch accent. This leads to the conclusion that our study should be limited to the realization of the L% boundary.

An interesting observation is that the realization of the L% boundary in syntactic phrases, such as Adverbial Phrases. Notice that the realization of the L% boundary in accentual phrases, depending on the position of the phrase in the sentence. This was exemplified in (6) and (10) where four accentual phrases are shown. Figure 14, where we can see the four

- (37) $\begin{array}{c} \text{L\%} \quad \text{H}^* + \text{L} \quad \quad \quad \text{L\%} \\ | \quad | \quad | \quad \quad \quad | \\ \text{a. má.yen} \quad \quad \quad \text{la} \\ \text{Amaya-GEN} \quad \text{frie} \\ \text{'The bed of the ch'} \end{array}$

Only in phrases in which the L% boundary is followed by a string of unaccented words. Thus, we have (38) almost as a rule. In (38) no accented roots or accents are singular, opposed to the realization of the L% boundary. This is the contour for this sentence in Figure 14.

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rasal H*+L pitch accent,
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stress in the sentence (cf.
pitch accent). Unaccented
tual phrase would always
position with respect to the

Following Pierrehumbert and Beckman's (1988) similar discussions on the realization of L% boundary tones and phrasal H tones in Japanese, we would argue that the L% boundary tone is present in the phonological representation of the utterance, but the timing available for its phonetic realization is too short. To state it informally, we would say that its potential time for realization is already *occupied* by the pitch accent.

Summarizing, we can say that a L% boundary tone will be associated to the first syllable in an accentual phrase unless this syllable has been assigned a pitch accent at the word level or at the phrasal level. The conclusion that can be drawn from such a restriction is that tones are assigned from the bottom up. That is, the realization of tones belonging to higher levels of phrasing is contingent upon the realization of tones at lower levels. This is another conclusion that our study shares with Pierrehumbert and Beckman (1988).

An interesting observation is that accentual phrases are not isomorphic with syntactic phrases, such as subject/object NPs, Prepositional Phrases, or Adverbial Phrases. Notice that a branching NP can be divided into two or more accentual phrases, depending on the number of lexical pitch accents occurring in the phrase. This was exemplified by (30b) and (31b), with two accentual phrases (cf. Figures 6 and 10). A more dramatic example is provided in (37), where four accentual phrases are distinguished within the same NP. See Figure 14, where we can see the four L tones beginning each accentual phrase:

- (37) L% H*+L L% H*+L L% H*+L L% H*+L
 | | | | | | | | | | | |
 a.má.yen la.gú.nen u.mí.en o.yà
 Amaya-GEN friends-GEN PL children-GEN-PL bed
 'The bed of the children of Amaya's friends'

Only in phrases in which no pitch accent occurs will we find an initial L tone followed by a string of H tones, which extends to the end of the phrase. Thus, we have (38) almost as a minimal pair with (37), the difference being that in (38) no accented roots or accented suffixes occur (the genitive suffixes in (38) are singular, opposed to the plural genitives of (37)). We illustrate the F₀ contour for this sentence in Figure 15:

(38) L% H H H H H H H H H*+L
 | | | | | | | | | |
 ni . re a . men la . gu . nen u . mi . en o . ya
 my mother-GEN friend-GEN child-GEN bed
 'The bed of the child of my mother's friend'

Another piece of evidence showing the lack of isomorphism between syntactic and intonational constituency comes from the opposite direction, namely from the fact that an accentual phrase may span more than one syntactic phrase. In sentences such as the ones in (39) and (40) there is more than one syntactic maximal projections preceding the verb, as indicated by the brackets. These syntactic phrases contain only unaccented words, and the last word in the last syntactic phrase receives the most prominent stress in the utterance, by virtue of being in a position immediately preceding the verb. The phrasal H*+L pitch accent that is assigned to this phrase marks the right edge of an accentual phrase, and the H tone of this pitch accent spreads onto the syllables to the left, except for the initial syllable of the utterance, which is assigned a L% boundary tone (cf. Figures 16-17):

(39) L% H H H H H H H H*+L
 | | | | | | | |
 [NP ni . re a . ma] [PP I . ru . ñ a . r à] [VP allaga da]
 my mother Iruña-ALL arrive AUX
 'My mother has arrived at Iruña'

(40) L% H H H H H H H H H*+L
 | | | | | | | | | |
 [NP u . mi . a . ri] [AdvP nor . ma . li . an] [NP u . rà] [VP emoten dotzágu]
 child-DAT normally water give AUX
 'Normally, we give water to the child'

This intonational pattern comes as no surprise to generative linguists, given the common assumption about the modularity of grammar, that is, that the different components of grammar (lexicon, syntax, semantics, phonology) are interconnected, but that each of them has its own inner structure and follows different algorithms for building constituency.

5.1.3 Catathesis

The contour shown in Figure 40. The four peaks descend progressively, suggesting a progressive descent of pitch across phrases in Lekeitio Basque. The H*+L pitch accent. Note that the peaks have to be lexical pitch accents. Observe for example Figure 41 in (41), with a lexical pitch

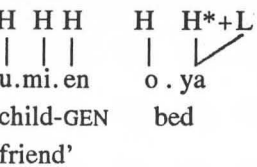
(41) L% H*+L
 | | |
 a . má . yen
 Amaya-GEN
 'Amaya's child'

An interesting aspect of the intonation in Basque, that is, whether the accentual phrase is larger than the syntactic phrase in which we argue for the existence of the accentual domain in Lekeitio Basque.

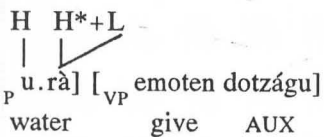
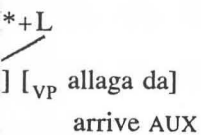
So, to summarize the intonational pattern, there is an initial L% boundary tone at the start of the phrase, unless this syllable is lexically accented. The H*+L tone of the pitch accent receiving the main prominence of the phrase is marked by a H*+L tone of the pitch accent spreading onto the syllables to the left.

5.2 The intermediate phrase

In Lekeitio Basque we find a dominating accentual phrase structure. The intonational phrase break in the sentence illustrated in (42) is at the end of the sentence.



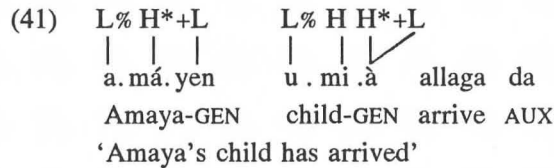
...k of isomorphism between
 ...om the opposite direction,
 ...span more than one syntactic
 ... (40) there is more than one
 ... as indicated by the brackets.
 ...ords, and the last word in the
 ...t stress in the utterance, by
 ...the verb. The phrasal H*+L
 ...ne right edge of an accentual
 ... onto the syllables to the left,
 ...n is assigned a L% boundary



...o generative linguists, given
 ...grammar, that is, that the
 ... semantics, phonology) are
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5.1.3 Catathesis

The contour shown in Figure 14 is indicative of catathesis having applied. The four peaks descend progressively in tonal value, in a stairway fashion. This progressive descent suggests that catathesis forms chains across accentual phrases in Lekeitio Basque, triggered by a H*+L pitch accent on a subsequent H*+L pitch accent. Note that the pitch accents affected by catathesis do not have to be lexical pitch accents. Catathesis affects phrasal pitch accents as well. Observe for example Figure 18, which represents the contour of the utterance in (41), with a lexical pitch accent being followed by a phrasal pitch accent:



An interesting aspect to consider is the domain of catathesis in Lekeitio Basque, that is, whether catathesis creates chains across intonational domains larger than accentual phrases. We will discuss this issue in the following section, in which we argue for the existence of the intermediate phrase as an intonational domain in Lekeitio Basque.

So, to summarize the structure of accentual phrases in Lekeitio Basque: there is an initial L% boundary tone which is associated to the first syllable in the phrase, unless this syllable receives a H*+L pitch accent (i.e., unless this syllable is lexically accented or the only syllable of an unaccented word receiving the main prominence in the sentence). The right edge of an accentual phrase is marked by a H*+L pitch accent, be it lexical or phrasal, and the H tone of the pitch accent spreads onto the syllables to its left.

5.2 The intermediate phrase

In Lekeitio Basque we could identify a prosodic constituent immediately dominating accentual phrases: the intermediate phrase. The major indicator of an intonational phrase break is the blocking of catathesis, as in Japanese. In the sentence illustrated in (42), for instance, there are three accentual phrases,

represented by the words *amáyen*, *amumári* and *liburúa*, each of them carrying a lexical pitch accent:

- (42)
- | | | | |
|---|-------------------|-----------------------------------|------------|
| L% H*+L | L%H H*+L | L% H H*+L | |
| | | | |
| | | | |
| [_{NP} a . má . yen | a . mu . má . ri] | [_{NP} li . bu . rú . a] | emon dotzo |
| Amaya-GEN | grandmother-DAT | book-ABS | give AUX |
| ‘(S)he has given the book to Amaya’s grandmother’ | | | |

In Figure 19 it can be observed that the second pitch accent, corresponding to the accented syllable in *amumári*, is catathesized with respect to the first pitch accent, but the third pitch accent is not catathesized with respect to the second pitch accent. Contrast this contour with the one in Figure 14, where catathesis has been applied across all four accentual phrases. One could argue that the difference lies in the fact that the accentual phrases in (37) form part of the same syntactic constituent, i.e., an NP, and that those in (42) are divided in two syntactic phrases, i.e., two NPs. The first two accentual phrases are part of the dative NP, and the third accentual phrase is part of the direct object NP. Thus, the idea would be that catathesis does not chain across two syntactic maximal projections. This hypothesis, however, encounters the problem posed by the fact that catathesis applies between two accentual phrases belonging to different syntactic phrases. In (43) below there are two accentual phrases, as shown by the two peaks in the intonational contour of the utterance (cf. Figure 20), and each of them corresponds to a different syntactic maximal category:

- (43)
- | | | |
|-------------------------------------|-----------------------------------|------------|
| L% H H*+L | L% H H*+L | |
| | | |
| | | |
| [_{NP} a . ma . yá . ri] | [_{NP} li . bu . rú . a] | emon dotzo |
| Amaya-DAT | book-ABS | give AUX |
| ‘(S)he has given the book to Amaya’ | | |

As Figure 20 shows, catathesis has downstepped the second pitch accent in the presence of a preceding H*+L pitch accent, even though the two accentual phrases are in two separate syntactic maximal projections.

When we consider three maximal projections preceding the verb, each of

them containing one accent. Catathesis applies to the second pitch accent, but the third pitch accent and its intonational contour

- (44)
- | | |
|------------------------------|--------------------|
| L% H*+L | L% |
| | |
| | |
| [_{NP} a . má . ya] | [_{PP} or |
| Amaya | th |
| ‘Amaya will go to | |

The intonational contour presented in Figure 19, with the same maximal projection, is a single projection. Our analysis of syntactic maximal projections and second, we assume that in Japanese (cf. section 4) catathesis. This is why catathesis applies between two accentual phrases in Figure 19, but not between the two accentual phrases in Figure 20, which is composed of a single accentual phrase. This phenomenon would be a result of phrase formation that Nespor (1986) has noticed in this regard. Notice that the restructuring; an intermediate phrase remains on the right edge of the utterance.

The paradigm is complete. In the case of two accentual phrases, the first one and the second one contained in another maximal projection. In our analysis, catathesis applies to the first intermediate phrase, being

...ría, each of them carrying

H H*+L
 | | |
 ou . rú . a] emon dotzo
 book-ABS give AUX
 andmother'

pitch accent, corresponding with respect to the first pitch with respect to the second Figure 14, where catathesis One could argue that the s in (37) form part of the e in (42) are divided in two ntual phrases are part of the the direct object NP. Thus, ross two syntactic maximal ie problem posed by the fact ases belonging to different ntual phrases, as shown by erance (cf. Figure 20), and maximal category:

H*+L
 |
 . a] emon dotzo
 give AUX

...nd the second pitch accent in en though the two accentual ections. preceding the verb, each of

them containing one accentual phrase, however, an interesting pattern obtains. Catathesis applies to the second pitch accent, triggered by the first H*+L pitch accent, but the third pitch accent is not downstepped. See the example in (44), and its intonational contour illustrated in Figure 21:

(44)

L% H*+L L% H H H H*+L L% H H H*+L
 | | | | | | | | | | | | | |
 [NP a.má. ya] [PP on.go e.we.ní. an] [NP on.da.rre.rà] žungó-da
 Amaya thus-OF Thursday-INES beach-ALL go-FUT AUX
 'Amaya will go to the beach this Thursday'

The intonational contour in Figure 21 looks very similar to the one we presented in Figure 19, where the first two accentual phrases were part of the same maximal projection, and the third one was part of another maximal projection. Our analysis of this pattern is the following: first, we argue that a syntactic maximal projection marks the boundaries of an intermediate phrase; and second, we assume that an intermediate phrase break blocks catathesis, as in Japanese (cf. section 4.2). That is, a syntactic phrase is a barrier for catathesis. This is why catathesis does not apply between the second and third accentual phrases in Figures 19 and 21. Now, to account for the occurrence of catathesis between the two accentual phrases in Figure 20 and the first two accentual phrases in Figure 21, we must assume that an intermediate phrase composed of a single accentual phrase cannot be left stranded on the left edge of the utterance and is restructured as part of the following intermediate phrase. This phenomenon would be similar to the cases of restructuring in phonological phrase formation that Nespor and Vogel (1986) discuss for Italian and English. Notice in this regard that there is a constraint in the directionality of restructuring; an intermediate phrase containing only one accentual phrase may remain on the right edge of the utterance (cf. (42), (44) and Figures 19 and 21).

The paradigm is completed with an example in which there are three accentual phrases, the first one contained in a maximal projection and the other two contained in another maximal projection (cf. (45) below). As expected from our analysis, catathesis applies in a chain formation (cf. Figure 22). The first intermediate phrase, being composed of a single accentual phrase, is

incorporated into the following intermediate phrase, and thus the first pitch accent triggers catathesis onto the second pitch accent. The second pitch accent, in turn, triggers catathesis on the following pitch accent, since they are contained in the same intermediate phrase.

(45) L% H H*+L L% H*+L L% H H*+L
 | | | | | | | | | | |
 [_{NP} a.mu.má.ri] [_{NP} a.má.yen li.bu.rú.a] emon dotzat
 grandmother-DAT Amaya-GEN book-ABS give AUX
 'I have given Amaya's book to the grandmother'

5.3 The utterance

The utterance is the largest intonational phrase in Lekeitio Basque, comprising intermediate phrases and accentual phrases within them. This domain is marked by L% and H% boundary tones occurring at its beginning and end. The initial L% boundary tone is a property of declarative sentences, and is associated to the initial syllable in the utterance, provided it does not bear a pitch accent. I will show in section 7 that an initial H% tone is a property of interrogative sentences. An interesting observation is that Basque does not have final rising at the end of interrogative sentences, except in recent innovations among young speakers (cf. sections 7.2.1 and 7.2.2). In sum, these L% and H% boundary tones, together with pitch range, contribute to indicate whether an utterance is declarative or interrogative. The utterance is also the domain of declination.

To summarize this section, let us recapitulate the different intonational units we have distinguished in Lekeitio Basque, as well as their main features:

1) *accentual phrase*:

- initial L% boundary tone associated to the first syllable in the phrase, provided it has not been assigned a pitch accent;
- a H*+L pitch accent marks the right edge of an accentual phrase; the H tone spreads onto all the syllables to the left up to the initial syllable;

2) *intermediate phrase*:

- comprises one or more accentual phrases on the left of the following intermediate phrase, and
- the intermediate phrase is marked by an initial L% boundary tone and a final H% boundary tone.

3) *utterance*:

- initial L% boundary tone associated to the first syllable in the utterance, provided it has not been assigned a pitch accent;
- final L% boundary tone associated to the last syllable in the utterance, provided it has not been assigned a pitch accent;
- the utterance is marked by an initial L% boundary tone and a final H% boundary tone.

6 Empirical consequences

At this point, it is important to discuss the consequences of focalization. As in all other languages, the focalized constituent in a sentence in Lekeitio Basque is the verbal complex formed by the verb and its arguments. The focalized constituent is the one that receives the main stress, that is, it receives the main pitch accent (Hualde, Elordieta, and Elordieta 1994), certain prosodic rest words are grouped in phrasal units, located immediately before the focalized constituent.

use, and thus the first pitch
 ent. The second pitch accent,
 itch accent, since they are

L% H H*+L
 | | | |
 li . bu . rú . a] emon dotzat
 book-ABS give AUX
 'mother'

phrase in Lekeitio Basque,
 ses within them. This domain
 ing at its beginning and end.
 declarative sentences, and is
 provided it does not bear a
 ial H% tone is a property of
 is that Basque does not have
 except in recent innovations
 2). In sum, these L% and H%
 tribute to indicate whether an
 erance is also the domain of

he different intonational units
 as their main features:

o the first syllable in the
 ned a pitch accent;

at edge of an accentual
 e syllables to the left up

2) *intermediate phrase*:

- comprises one or more accentual phrases;
- every syntactic maximal projection marks the boundary of an intermediate phrase. A syntactic maximal projection occurring on the left edge of an utterance and containing a single accentual phrase cannot constitute an independent intermediate phrase, and is included as an accentual phrase within the following intermediate phrase;
- the intermediate phrase is the domain of catathesis;

3) *utterance*:

- initial L% and H% boundary tones, indicative of declarative or interrogative utterances, respectively (the initial L% is assigned to the first syllable in the utterance, provided it has not been assigned a pitch accent);
- final L% and H% boundary tones (L% is a property of both declarative and interrogative utterances; H% is an alternative marker of interrogatives - cf. section 7);
- the utterance is the domain of declination.

6 Empirical consequences: prosodic constraints on focalization

At this point, it is important to discuss the prosodic constraints imposed on focalization. As in all other dialects of Basque, the focalized constituent in a sentence in Lekeitio Basque has to occupy a position immediately preceding the verbal complex formed by the lexical verb and the inflected auxiliary. The focalized constituent is the most prominent element in the sentence prosodically; that is, it receives the main sentence stress. However, as already noted in Hualde, Elordieta, and Elordieta (1993) and in Hualde, Elordieta, and Elordieta (1994), certain prosodic restrictions appear to hold in Lekeitio Basque when words are grouped in phrases. Within a phrase formed only by unaccented words, located immediately preceding the verb, as in (46) below, only the

rightmost word can be prosodically prominent, by virtue of being in the position immediately preceding the verbal sequence. The semantic interpretation of the utterance is ambiguous: either the whole phrase or any of the elements within it can be understood as focalized, provided they can be identified as elements in contrastive focus with an earlier element in the discourse. The crucial point is that the only way this sentence can be pronounced is with main stress on the last element of the phrase. The other words in the phrase cannot receive prosodic prominence, even though the speaker may intend to assign semantic focality to a nonphrase-final word. A pronunciation in which any of the nonphrase-final words carried the most prominent stress would be ungrammatical. We mark focus stress with a circumflex accent above the relevant syllable nucleus; the focalized element is shown in capital letters in the English translation:

- (46) [sure erriko andra sarrâ] ikusi dot
 your town-OF woman old see AUX
 'I have seen THE OLD WOMAN FROM YOUR TOWN' / 'I have seen THE OLD WOMAN from your town' / 'I have seen the OLD woman from your town', etc.
- (47) a. *[sure erriko andrâ sarra] ikusi dot
 b. *[sure errikô andra sarra] ikusi dot
 c. *[surê erriko andra sarra] ikusi dot

The same pattern of prosody-semantics (dis)association would apply for a phrase in which the last element were an accented word (e.g., *sure erriko andra altía* 'the tall woman from your town'). The observation we make is that the only way a word can stand out prosodically and be understood unambiguously as the focalized element in the utterance is if it constitutes an accentual phrase on its own. That is, a focalized word will also stand out prosodically when it is uttered in isolation, when it is the only constituent preceding the verb, or when it is the sole word in an accentual phrase. These situations are exemplified in (48)-(50):

- (48) diruâ
 money
 'THE MONEY
- (49) diruâ emon
 money give
 '(S)he has given
- (50) L% H*+L L
 | | | |
 a. má.yen d
 Amaya-GEN n
 '(S)he has given

The cases in (48)-(49) illustrate a contrast with the form part of the same accentual phrase. The last unaccented word cannot be the semantic focus. Any word that does not necessarily entail semantic focality. Any word could be the semantic focus of the utterance. That is because the word *dirua* 'the money' can follow an accented word immediately precedes the verb (see Figure 23). The right edge of the unaccented word receives the corresponding to this focalized preceding accented word, as

By the same token, the word *amon* 'give' can also be interpreted as the semantic focus of the sentence in (51) and its corresponding English translation:

- (51) amâyen diruâ en
 '(S)he has given

- (48) diruâ
 money
 'THE MONEY'
- (49) diruâ emon nau
 money give AUX
 '(S)he has given me THE MONEY'
- (50) L% H*+L L% HH*+L
 | | | | | |
 a.má.yen di.ru. â emon nau
 Amaya-GEN money give AUX
 '(S)he has given me Amaya's MONEY'

The cases in (48)-(49) do not need further explanation. The example in (50) illustrates a contrast with the utterance in (46), in which the unaccented words form part of the same accentual phrase. As we mentioned above, in (46) only the last unaccented word can be the most prominent one prosodically, but this does not necessarily entail an interpretation in which only the last word is semantically focalized. Any of the unaccented words in the accentual phrase could be the semantic focus of the sentence. In (50), however, the unaccented word *dirua* 'the money' can be unambiguously interpreted as the semantic focus of the utterance. That is because this word forms its own accentual phrase; it follows an accented word, hence the initial L% boundary tone, and it immediately precedes the verb, thus receiving a phrasal H*+L pitch accent (cf. Figure 23). The right edge boundary is created by the H*+L pitch accent that the unaccented word receives by virtue of being phrase final. The peak corresponding to this focalized constituent is still lower than that of the preceding accented word, as an effect of declination.

By the same token, the accented word in (50) constitutes its own accentual phrase, and thus it could be the most prominent element in the utterance and also be interpreted as the semantic focus in the utterance. See for example the sentence in (51) and its corresponding illustration in Figure 24.²⁰

- (51) amâyen diruâ emon nau
 '(S)he has given me AMAYA'S money'

no accented words. Each of
and thus if they were the
e to stand out prosodically.
ated in Figures 25-26.

nau
AUX

clude that the unity of an
cannot be altered. If a word
it cannot be independently
lect of Tokyo studied by
all words, accented and
his contrast is due to the fact
pendently stressed. That is,
ly if they are in phrase-final
ase. In Tokyo Japanese all
odically prominent.

rosodic focalization patterns
mediate phrase boundary. By
and (52) do not undergo the
their nonfocalized versions,
(4) and (55) below). This has
1 (1988) for Japanese.

After having presented the accentual pattern of Lekeitio Basque, we will proceed to analyze the intonation contours of the major types of sentences in this dialect: declaratives (affirmative and negative), yes/no interrogatives, wh-interrogatives, and yes/no and wh-echo questions.

7 Intonation contours of the major types of sentences in Lekeitio Basque

7.1 Declarative sentences

Declarative sentences in Lekeitio Basque present a decreased pitch range up to the level of the baseline (i.e., the bottom of the speaker's range) at the end of the utterance, a pattern which is also shared by declarative sentences in most well-analyzed languages. We will thus posit the existence of a L% boundary tone at the end of declarative sentences in Lekeitio Basque. As we saw in section 5.1, the pitch region is reduced dramatically after the most prominent stress in the sentence. This could lead us to think that this region is deaccented. However, this would imply that all underlying pitch accents following the main stress are erased, until the L% boundary tone is reached. The fact that lexical pitch accents do surface in this region indicates that there is no deaccenting, but compression of the pitch range. That is, pitch accents are not erased, although they are weakened by a radical decrease of pitch range after the nuclear stress in the sentence. See, for instance, Figure 13, where the pitch accent of the verb is perceptible as a peak, although downstepped with respect to the first pitch accent. In this respect, Basque differs from English (cf. Pierrehumbert 1980), and resembles Swedish in its ability to realize pitch accents after the main sentence stress (cf. Pierrehumbert and Beckman 1988: 246-251, fn. 19). It should be noted that, unlike Swedish, pitch accents in Lekeitio Basque surface with very low peaks.

7.2 Interrogative sentences

7.2.1 Yes/no questions

The most common pattern in Lekeitio Basque yes/no questions is for the element about which the inquiry is being made to appear leftmost in the sentence, followed by the sequence formed by the lexical verb and the auxiliary. The object of inquiry receives the most prominent stress in the sentence, after

which a sharp drop in pitch is observed. Lekeitio Basque yes/no questions differ from languages such as Spanish and English in that they do not show a final rise (cf. Pierrehumbert 1980, for English; Navarro Tomás 1944, Sosa 1991, on Spanish intonation). In other words, they do not have a final H% boundary tone. Instead, they present a low or deaccented tonal contour after the most prominent tone on the left periphery of the sentence, without raising it. Thus, we posit a L% boundary tone for this kind of sentences, similar to declaratives. The difference between yes/no questions and declaratives lies in the substantially higher pitch range extending over the whole utterance that the former have, as well as the final lengthening of the last syllable in the utterance. We can see these features in the F_0 contour shown in Figure 29, for the sentence in (56) (we mark the most prominent syllable with a circumflex accent):

(56) H^*+L $L\%$
 ma.ri.bi allaga da e.rii.ra?
 Maribi arrive AUX town-ALL
 'Has Maribi arrived in town?'

Compare the F_0 contour in Figure 29 to the one in Figure 30, which corresponds to the declarative sentence (57):

(57) H^*+L $L\%$
 ma.ri.bi allaga da e.rii.ra
 'Maribi has arrived in town'

The absolute peak value for the pitch accent in Figure 29 is 184.8 Hz, and in the region after the peak the tonal values are in the 130-140 Hz range, the lowest point being 121.5 Hz. In contrast, the absolute peak value for the pitch accent in Figure 30 is substantially lower, at 160.8 Hz, and the tonal region located after it does not surpass 116.2 Hz. On the basis of these differences, we could posit an initial H% boundary tone for the utterance, which raises the baseline and sets the high pitch level. That is, we do not want to argue that the size of the pitch drop after the most prominent peak in the utterance is smaller in interrogative sentences than in declarative sentences. Indeed, we claim that the size of the pitch drop is the same in both types of utterances. But given the

higher initial pitch level (and a more prominent peak in interrogative sentences), declarative sentences, mean

Final lengthening is a property of interrogative sentences that the final syllable of the sentence (56) than it in the declarative sentence (57) (see Figures 29 and 30, where we mark the final syllable with a vertical line on the nuclear contour). The length of the region of final lengthening is a rough indicator of the degree of interrogativity.

Another property that distinguishes interrogative sentences from declaratives is accent placement. In declaratives, the accent is placed on the constituent with the focus (the object in the example). In interrogatives, the stress falls on the verb. This pattern illustrates this pattern in examples (56) and (58) by hyphenation (see Figure 29):

(58) H^*+L $L\%$
 oyan - da . gô
 bed-IN is
 '(S)he is in bed'

In yes/no questions the pitch accent is placed on the independent locus of pitch accent. Thus, compare sentence (56) with (59) in Figure 32.

(59) $H\%$ H^*+L $L\%$
 | | |
 o . yân da . gô
 'Is (s)he in bed?'

Before we finish this section, we note that Lekeitio Basque have started to show a final rise in Spanish. Nevertheless, this is not the following is an example (cf.

que yes/no questions differ they do not show a final rise más 1944, Sosa 1991, on a final H% boundary tone. ur after the most prominent raising it. Thus, we posit a nilar to declaratives. The es lies in the substantially ce that the former have, as the utterance. We can see for the sentence in (56) (we accent):

one in Figure 30, which

Figure 29 is 184.8 Hz, and the 130-140 Hz range, the ute peak value for the pitch 8 Hz, and the tonal region asis of these differences, we utterance, which raises the lo not want to argue that the k in the utterance is smaller nces. Indeed, we claim that of utterances. But given the

higher initial pitch level of interrogatives, the region which follows the most prominent peak in interrogative sentences will have a higher frequency than in declarative sentences, measured in absolute values.

Final lengthening is another characteristic of interrogative sentences. Note that the final syllable of *errira* is considerably longer in the interrogative sentence (56) than it is in the declarative sentence (57). This is shown in Figures 29 and 30, where we measure the duration of the final syllable by positioning a vertical line on the nucleus of the last syllable of the respective utterances. The length of the region of the utterance located after the vertical line serves as a rough indicator of the duration of the final syllable.

Another property that distinguishes yes/no questions from declaratives is accent placement. In declaratives, an unaccented synthetic verb forms a single constituent with the focalized element if it is unaccented, by prosodic cliticization. The stress falls on the last syllable of the synthetic verb. We illustrate this pattern in example (58) below, where we indicate the prosodic unit by hyphenation (see Figure 31):

- (58)
- | | | |
|---|-------------------|------|
| | | H*+L |
| | o | / |
| o | yan - da . gô | |
| | bed-IN is | |
| | '(S)he is in bed' | |

In yes/no questions the inquired or focalized element always constitutes an independent locus of pitch accent, i.e., the synthetic verb does not cliticize onto it. Thus, compare sentence (58) with (59), whose F_0 contour is represented in Figure 32.

- (59)
- | | | |
|-----|--------------------|----|
| H% | H*+L | L% |
| | / | |
| o . | yan da . go ? | |
| | 'Is (s)he in bed?' | |

Before we finish this issue, it must be pointed out that younger speakers of Lekeitio Basque have started to use final raising patterns, perhaps influenced by Spanish. Nevertheless, this pattern is very rare, even among these speakers. The following is an example (cf. Figure 33):

- (60) $H\%$ $H\%$
 | |
 allagâ ra Maribi erri.ra?
 arrive AUX Maribi town-ALL
 'Has Maribi arrived in town?'

7.2.2 Wh-questions

Like yes/no questions, wh-questions also present a raised baseline and a high pitch level, and thus we will posit an initial $H\%$ boundary tone belonging to the utterance level. Wh-questions are characterized by a sharp drop in pitch after the high peak level of the wh-word, which is always accented. In most natural circumstances, these constructions do not present final raising at the end of the contour, as in the case of yes/no questions. Observe, for example, the F_0 contour in Figure 34 for the sentence in (61):

- (61) $H\%$ H^*+L $L\%$
 | | | |
 no . rê . na da ori umi.a?
 whose is that child
 'Whose is that child?'

These constructions also have the idiosyncratic property of introducing penultimate stress on the compound formed by the lexical verb and the auxiliary. Compare the declarative sentence in (62) with its wh-counterpart in (63) (Figures 35 and 36, respectively):

- (62) umiâ erun dogu mendira
 child take AUX mountain-ALL
 'We have taken the child to the mountain'
- (63) $H\%$ H^*+L $H^*+L\%$ $L\%$
 | | | |
 nôr erun dó . gu men.di.ra?
 who take AUX mountain-ALL
 'Who have we taken to the mountain?'

Finally, like in yes/no questions, wh-questions with final raising are not found in all speakers, although it is an alternative counterpart in some dialects.

- (64) $H\%$ H^*+L
 | |
 nôr eru

7.2.3 Echo questions

7.2.3.1 Yes/no echo

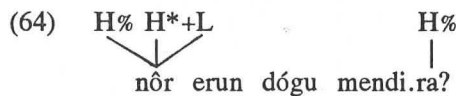
By yes/no echo questions, we refer to those questions used to request confirmation of a previous statement. In Basque these sentences are related to an initial $H\%$ boundary tone. In echo interrogatives, such a tone is perceptible as in other types of yes/no echo questions (see Figure 39):

- (65) $H\%$ H^*+L
 | |
 u.mi.â eru
 child take
 '(Are you sure?)'

- (66) $H\%$ H^*+L
 | | | |
 li.bu.rû . a
 book
 '(Are you sure?)'

As we can see in Figure 39, the initial $H\%$ boundary tone is related to the pitch accents in declarative sentences.

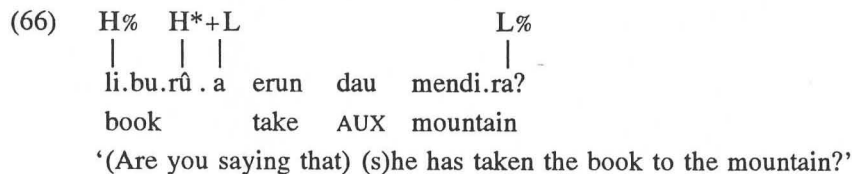
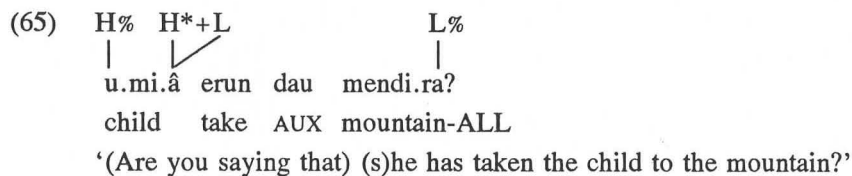
Finally, like in yes/no questions, we have to point out that a pronunciation of *wh*-questions with final raising at the end is also possible among younger speakers, although it is very rare. The utterance in (63) could thus have an alternative counterpart in (64) (cf. Figure 37):



7.2.3 Echo questions

7.2.3.1 Yes/no echo questions

By yes/no echo questions I refer to those interrogative sentences which are used to request confirmation on a previous piece of the discourse. In *Lekeitio Basque* these sentences are characterized by their high pitch range, an effect related to an initial H%. However, this pitch range is higher than that of non-echo interrogatives, such that the pitch drop after a pitch accent is not as perceptible as in other types of utterances. In (65) and (66) we provide examples of yes/no echo questions, whose F₀ contours are represented in Figures 38 and 39:



As we can see in Figures 38 and 39, the pitch drop which would correspond to the pitch accents in declarative or non-echo interrogative sentences is reduced

in yes/no echo questions. In other words, there is no deaccenting of the portion of the utterance which follows the preverbal element (cf. the discussion of sentences (32)-(34) in section 5.1.2). This feature is more salient in yes/no echo questions formed by unaccented words (cf. (65), Figure 38). In these sentences a high pitch plateau is formed after the first H tone in the utterance (i.e., the second syllable in the utterance), and the pitch drop which in other types of sentences would be part of the phrasal pitch accent assigned to the element immediately preceding the verb is almost imperceptible (cf. the shallow dip in the total contour between the last syllable of *umia* and the verb *erun*). The high pitch plateau is maintained until the end of the utterance, where final lowering applies, dropping the pitch level dramatically. It should be pointed out that unlike for non-echo yes/no questions, final lowering is the only possible way to end these sentences. Final raising is excluded as an alternative, even among young speakers. The vertical line placed on the last segment of the utterance serves to indicate final lengthening, typical of interrogatives in Lekeitio Basque. Thus, we posit a final L% boundary tone at the end of the utterance for yes/no echo questions.

In yes/no echo questions with an accented word before the verb, the pitch accent of the accented word is more perceptible than that of an unaccented word, according to the F_0 contour shown in Figure 39. Nevertheless, the pitch drop of the H*+L pitch accent is still very small compared to the one found in the other types of utterances. For a better illustration of this property of echo questions, let us compare the F_0 contours in Figures 38 and 39 with those of their declarative and non-echo counterparts, represented in (67) and (68) (cf. Figures 40-43):

- (67) a. H^*+L
 u.mi.â erun dau mendira
 '(S)he has taken the child to the mountain'
- b. H^*+L
 | |
 li.bu.rû . a erun dau mendira
 '(S)he has taken the book to the mountain'

- (68) a. H^*+L
 u.mi.â eru
 'Has (s)he
- b. H^*+L
 | |
 li.bu.rû . a
 'Has (s)he ta

Echo questions have a 1st peak in Lekeitio Basque interrogatives in Lekeitio Basque. The 1st peak in echo utterances always reaches 123.1 Hz, while the 1st peak in other utterances reaches 126.5 Hz. The corresponding values for the rest of the utterance are 118-125 Hz and 129-135 Hz, respectively, at the end of the utterances. In declarative sentences in (67) and (68), the values are 118-125 Hz and 129-135 Hz, at the end of the utterances.

7.2.3.2 Wh-echo questions

Wh-echo questions share with non-echo questions a high pitch level extending over the entire utterance and a pitch drop after the most prominent element. In wh-echo questions present with respect to the utterance, the pitch level they present at the end. Indeed, the pitch level of echo questions from their non-echo counterparts is 7.2.2, non-echo wh-questions

- (68) a. H^*+L
 u.mi.â erun dau mendira?
 'Has (s)he taken the child to the mountain?'
- b. H^*+L
 li.bu.rû . a erun dau mendira?
 'Has (s)he taken the book to the mountain?'

Echo questions have a higher overall pitch level than declaratives and interrogatives in Lekeitio Basque. This does not mean that the most prominent peak in echo utterances always has a higher tonal value than the most prominent peak in other utterances. Rather, what characterizes echo questions is the high frequency of the rest of the utterance. In the utterance in (65), for instance, the tonal contour in the high tone plateau never goes below 150 Hz, and the lowest point is registered at 123.1 Hz, at the end. In the utterance in (66) the frequency after the pitch accent is maintained at 163-165 Hz, lowering at the end until it reaches 126.5 Hz. The corresponding declarative and non-echo counterparts, however, show a lower frequency rate after the main stress in the utterance. For the declarative sentences in (67a,b) we recorded frequency rates of 115-122 Hz and 109-115 Hz, respectively, the lowest points being 112.8 Hz and 109 Hz, at the end of the utterances. In the interrogative sentences in (68a,b) the tonal values are 118-125 Hz and 129 Hz, respectively, the lowest points being 109.1 Hz and 113 Hz, at the end of the utterances.

7.2.3.2 Wh-echo questions

Wh-echo questions share with yes/no echo-questions the property of having a high pitch level extending over the whole utterance and having a shallow pitch drop after the most prominent pitch accent. The only difference which wh-echo questions present with respect to yes/no echo questions is the final raising that they present at the end. Indeed, this is a property which also distinguishes wh-echo questions from their non-echo counterparts. As we mentioned in section 7.2.2, non-echo wh-questions present final lowering in natural circumstances,

final raising being an alternative only among younger speakers. In *wh*-echo questions, however, only final raising is possible. We would thus posit a final H% boundary tone, as well as an initial H% boundary tone responsible for the high pitch range of all interrogatives. See the examples in (69)-(70), and their respective F₀ contours in Figures 44 and 45:

- (69) $\begin{array}{c} \text{H\%} \quad \text{H*+L} \qquad \qquad \qquad \text{H\%} \\ \diagdown \quad \diagup \qquad \qquad \qquad | \\ \text{n\^o}r \quad \text{erun} \quad \text{dau} \quad \text{mendi.ra?} \\ \text{who} \quad \text{take} \quad \text{AUX} \quad \text{mountain-ALL} \\ \text{'Who (did you say that) (s)he took to the mountain?'} \end{array}$

- (70) $\begin{array}{c} \text{H\%} \quad \text{H*+L} \qquad \qquad \qquad \text{H\%} \\ | \quad | \quad | \qquad \qquad \qquad | \\ \text{no} \cdot \text{r\^e} \cdot \text{na} \quad \text{ra} \quad \text{umi.a?} \\ \text{who-GEN} \quad \text{AUX} \quad \text{child} \\ \text{'Whose (did you say that) the child is?'} \end{array}$

There is a pending issue in our treatment of echo questions: how do we account for the high pitch level that echo questions present through the whole utterance? Positing an initial H% boundary tone would not be sufficient to distinguish echo questions from non-echo questions. Echo questions differ from non-echo questions in that they maintain the high pitch level until the end of the utterance, such that the pitch drop after a pitch accent is less perceptible than in non-echo questions. One possibility would be to suggest the existence of a final H⁻ boundary tone anchored to the right edge of the accentual phrase preceding the verb in echo questions, and that this tone maintains the high pitch level. This H⁻ tone is the reinterpretation that Beckman and Pierrehumbert (1988) make of Pierrehumbert's (1980) phrasal accent. If our hypothesis is correct, then this would lead us to assume the existence of a L⁻ boundary tone after the final stress in declaratives and non-echo interrogatives, which would be responsible for the fall in pitch (cf. section 5.1.2). In order to decide on the validity of this proposal, further investigation would be required. At this point, we would limit ourselves to suggesting these plausible alternatives.

8 Summary and conclusion

In this paper I have stated my original ideas on intonation. Based on original ideas of Pierrehumbert and Beckman (1988), I propose that the different patterns of tones are hierarchically structured in intonational units. These intonational units imply specific shapes of the tones associated with them. The intonational contours of utterances allow a more systematic account of pitch accents associated to pitch accents, such as the high tones located to their right. The high tones located above the word level are distributed by means of collective intonation: an initial L% boundary tone in the phrase, and the H tones result from the second syllable of the constituent under which accents are located. This unit is independently realized, but catathesis may apply, but not maximal projection constituent. The projection containing a single accent which is joined into the following intonation unit at the level where L% and H% meet.

Among other interesting findings, it is seen that a word can only be stressed in a phrase by itself, and that focus is achieved by blocking the chain of catathesis.

We finished our study by analyzing the intonation types of sentences in Leko (1988). In declarative and interrogative sentences and in utterances were stressed in the

8 Summary and conclusions

In this paper I have studied the intonational system of Lekeitio Basque. Based on original ideas by Beckman and Pierrehumbert (1986) and Pierrehumbert and Beckman (1988), I have argued that the best way to capture the different patterns of tones in this language is to assume the existence of several well-defined intonational domains to which these tones belong, hierarchically structured in the phonological representation of an utterance. These intonational units impose their own well-formedness constraints on the shapes of the tones associated to them. Together they create and model the intonational contours of utterances. Specifically, we have shown that this theory allows a more systematic account of the distribution and realization of tones not associated to pitch accents, such as the L tones appearing on the initial syllables of words and the high tones occurring between this initial L tone and a pitch accent located to their right. We suggested that they belong to a prosodic phrase located above the word level, the accentual phrase, which governs their distribution by means of collocational restrictions. The initial L tone is in reality an initial L% boundary tone, which associates to the initial syllable of the phrase, and the H tones result from the spreading of a phrasal H tone associated to the second syllable of the phrase. We also identified a higher prosodic constituent under which accentual phrases are grouped: the intermediate phrase. This unit is independently motivated as the domain within whose boundaries catathesis may apply, but not across them. We have argued that every syntactic maximal projection constitutes an intermediate phrase, except for a maximal projection containing a single accentual phrase on the left edge of the sentence, which is joined into the following intermediate phrase. Finally, the utterance is the level where L% and H% boundary tones are inserted.

Among other interesting properties of Lekeitio Basque intonation, we have seen that a word can only be focalized prosodically if it forms an accentual phrase by itself, and that focalization creates intermediate phrase boundaries by blocking the chain of catathesis effects.

We finished our study by analyzing the intonational contours of the major types of sentences in Lekeitio Basque. The presence of final lowering in interrogative sentences and the differences between echo and non-echo utterances were stressed in the discussion.

Appendix: Index of Figures

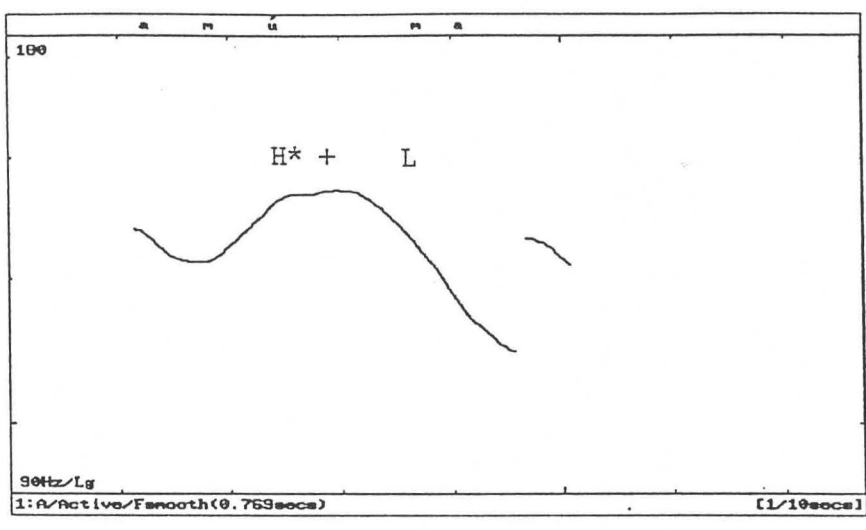


Fig. 1

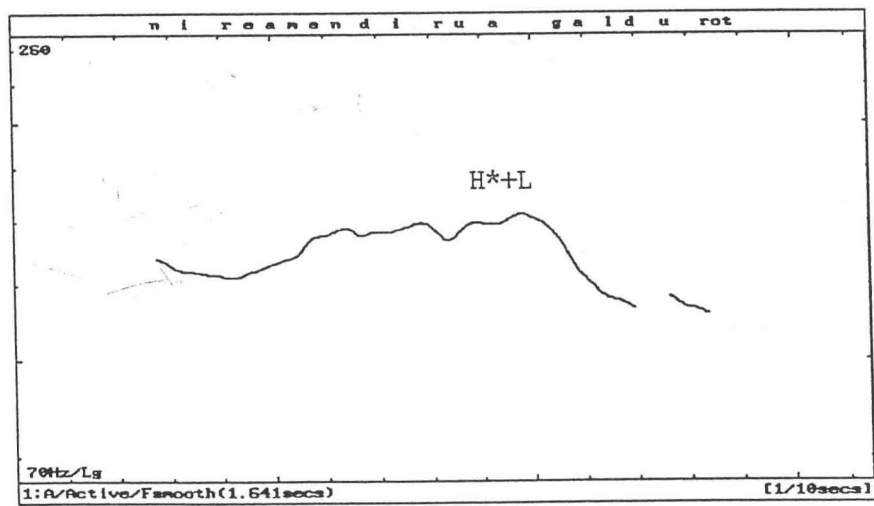
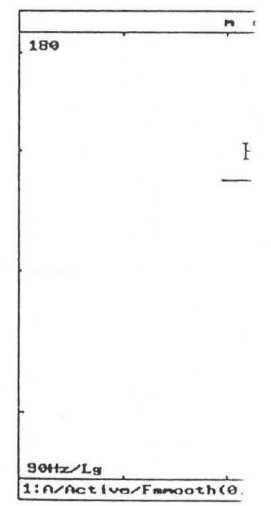
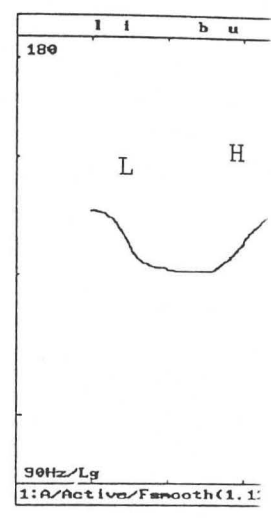


Fig. 2



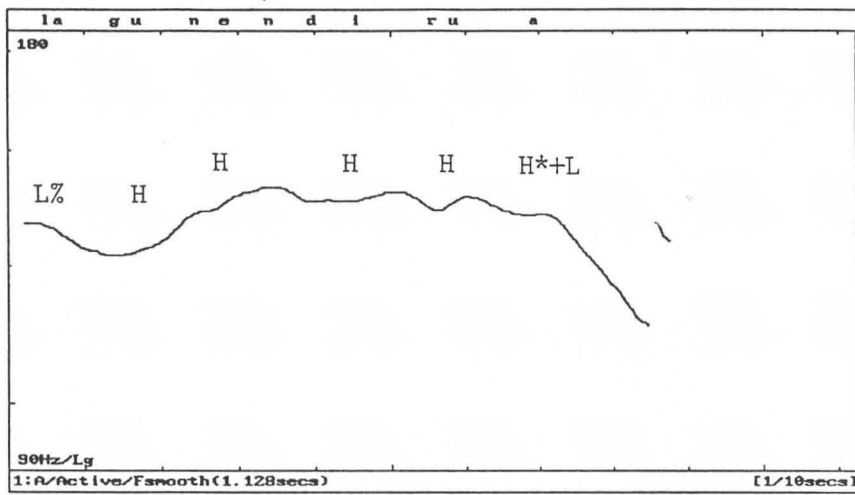


Fig. 5

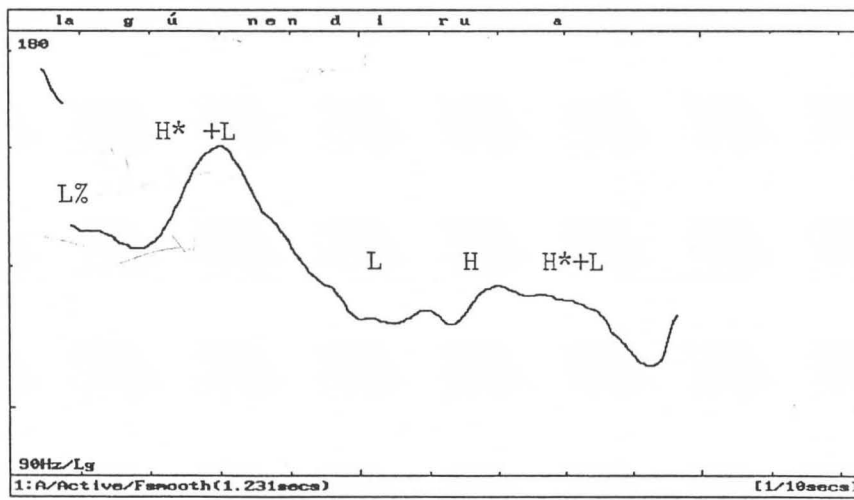
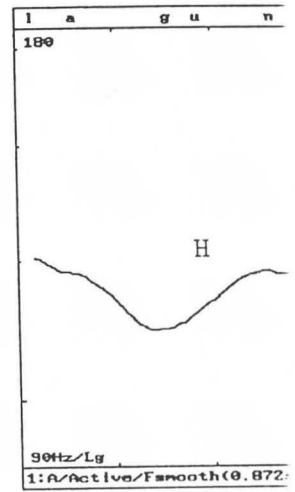
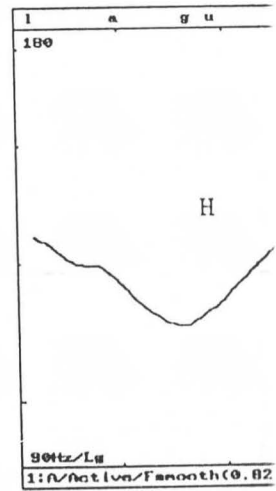


Fig. 6



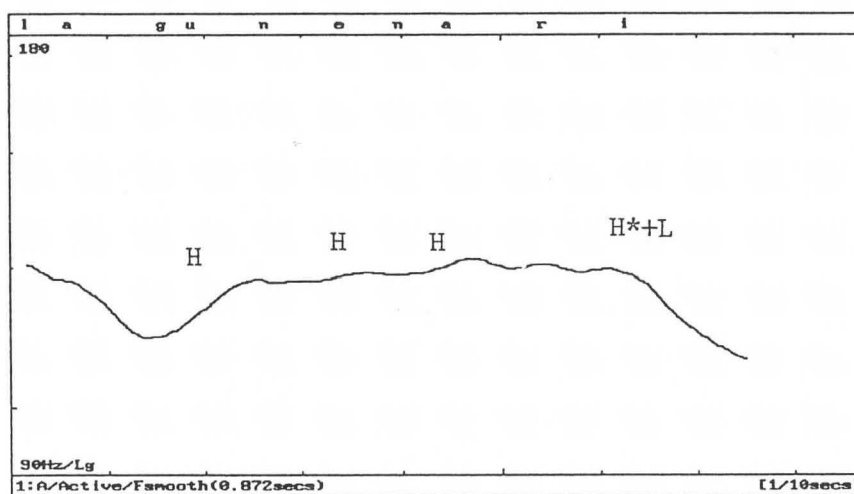
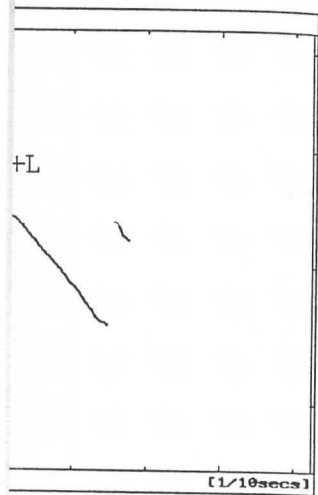


Fig. 7

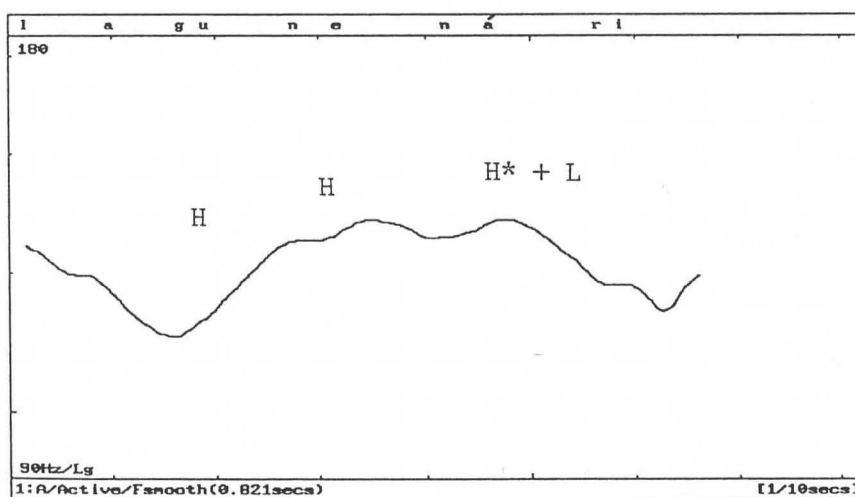
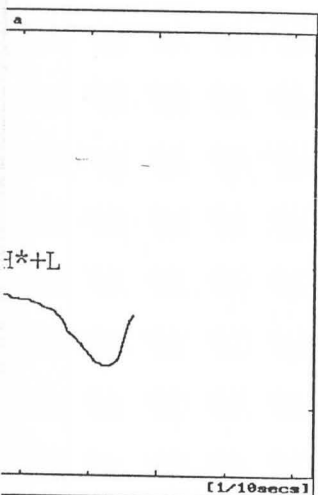


Fig. 8

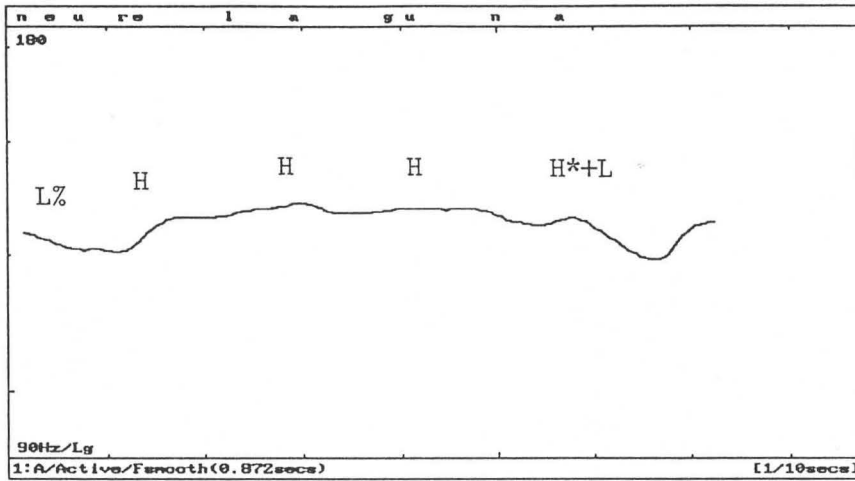


Fig. 9

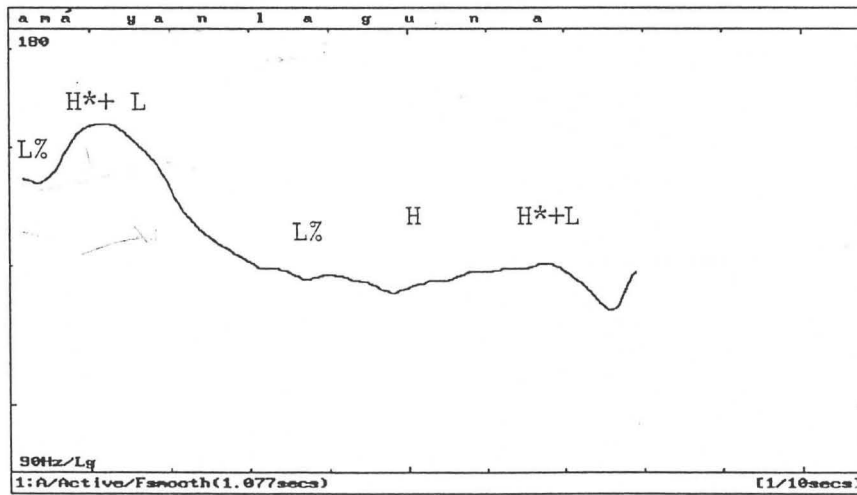
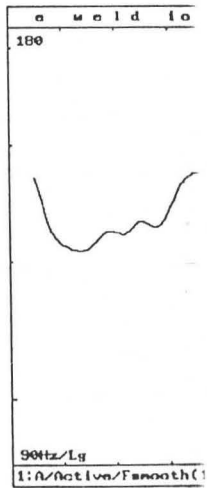
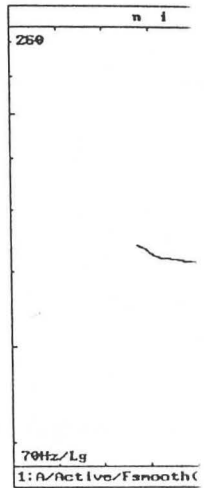


Fig. 10



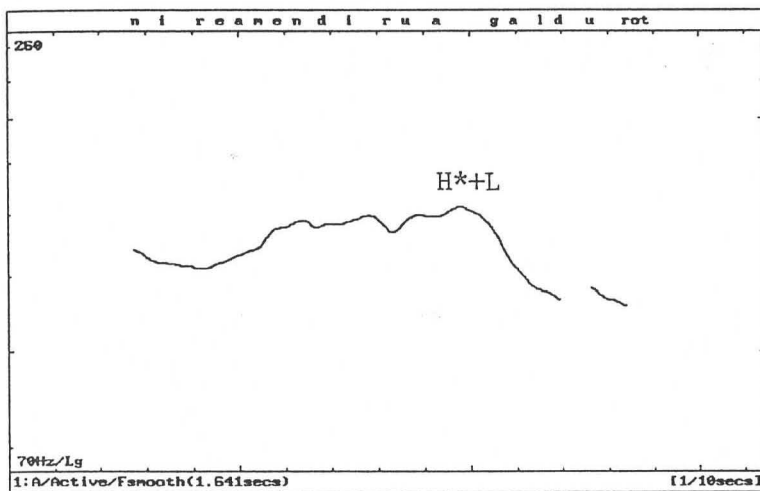
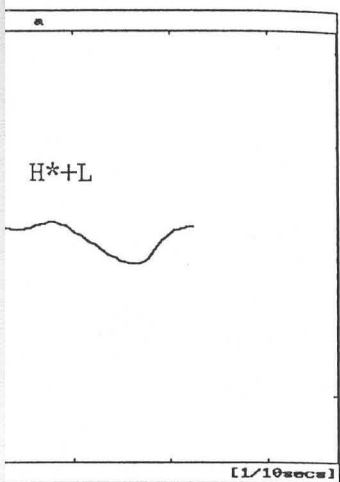


Fig. 11

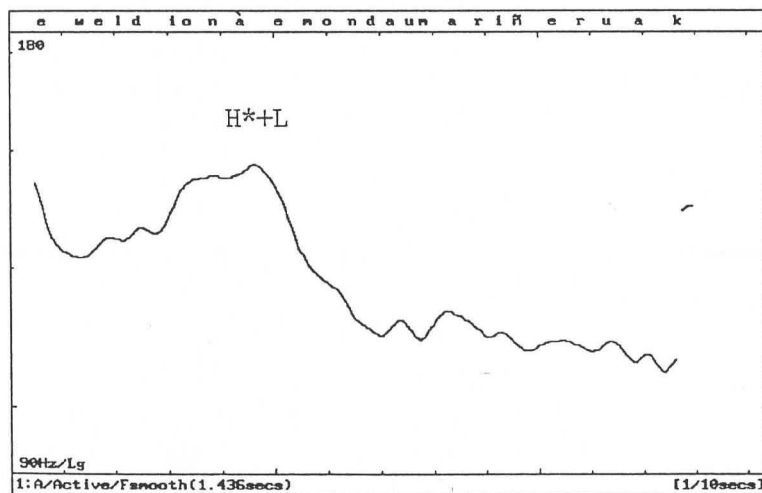
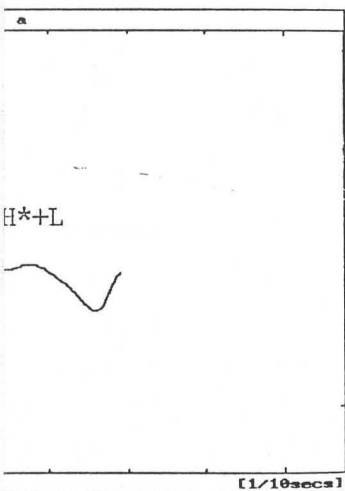


Fig. 12

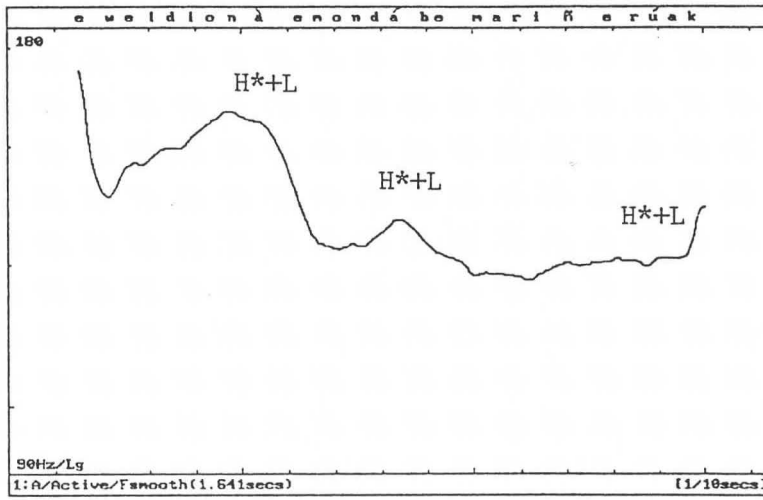


Fig. 13

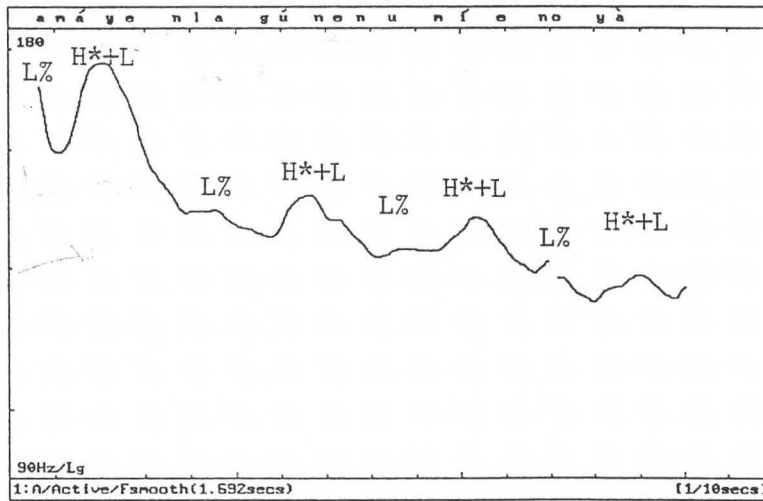
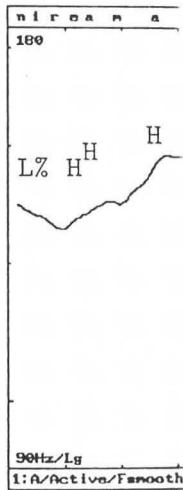
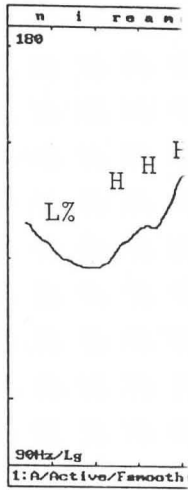


Fig. 14



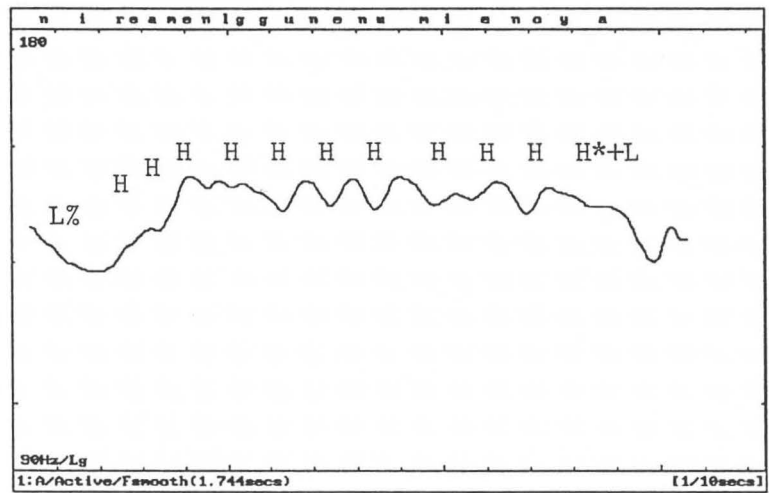
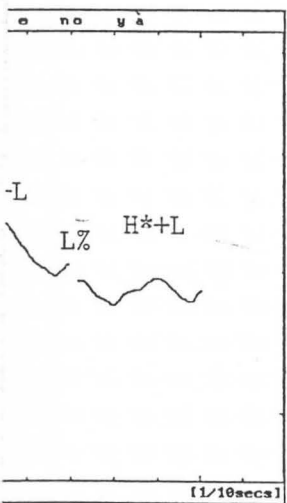
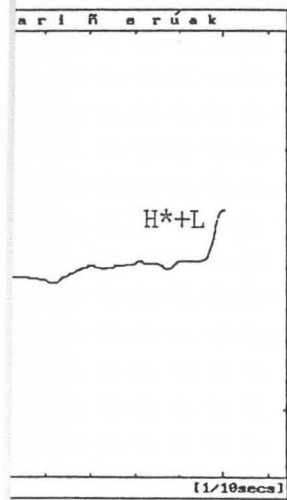


Fig. 15

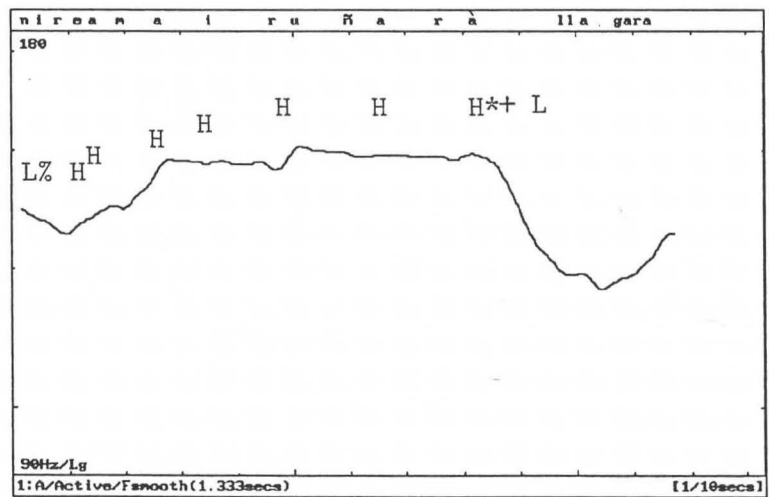


Fig. 16

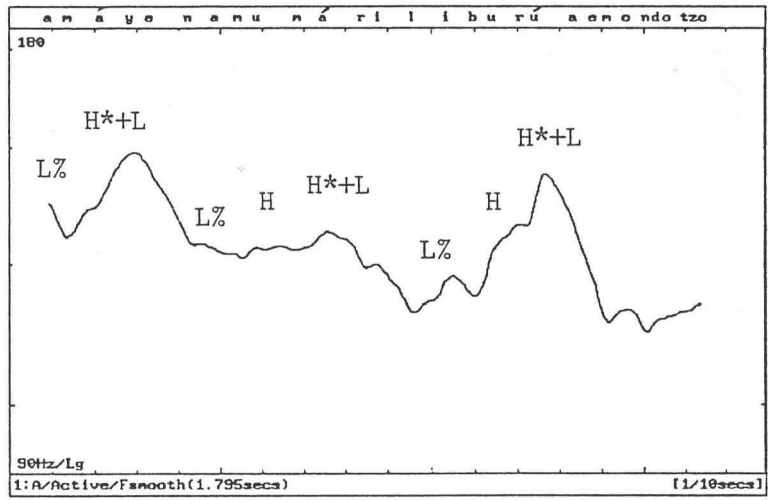
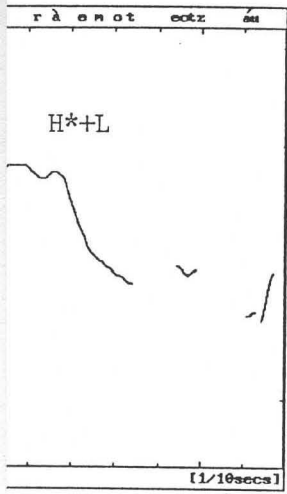


Fig. 19

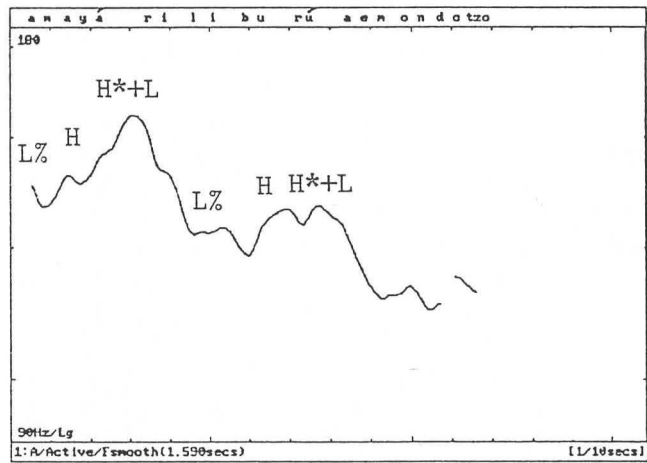


Fig. 20

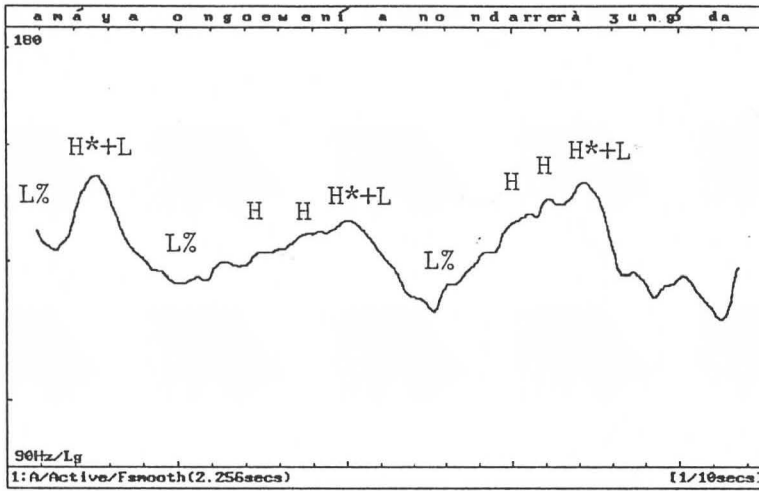


Fig. 21

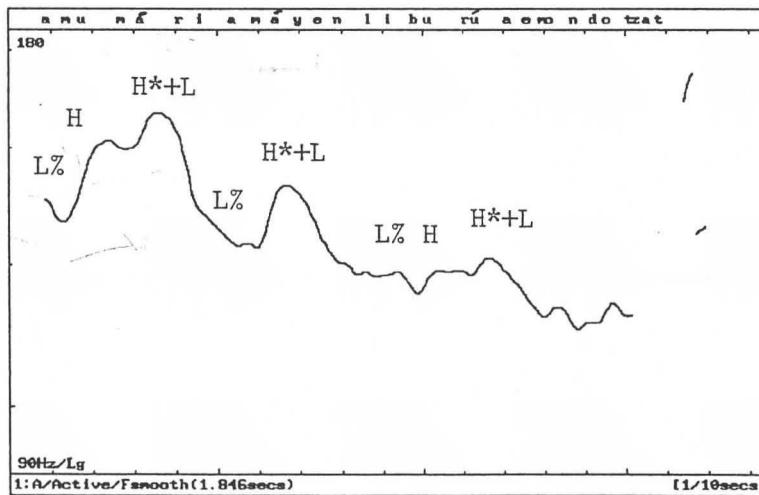
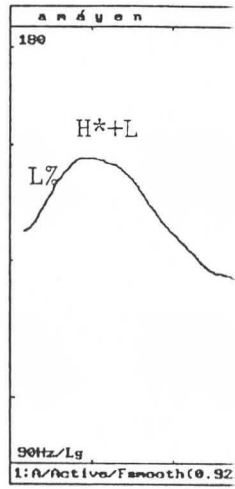
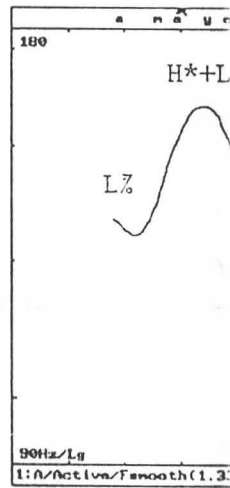


Fig. 22



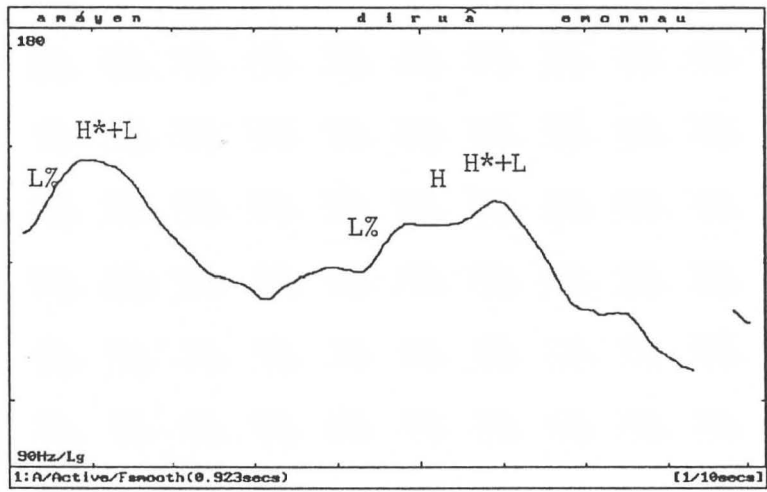
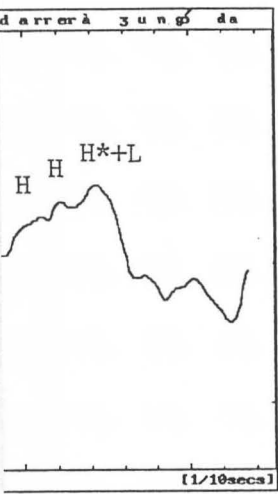


Fig. 23

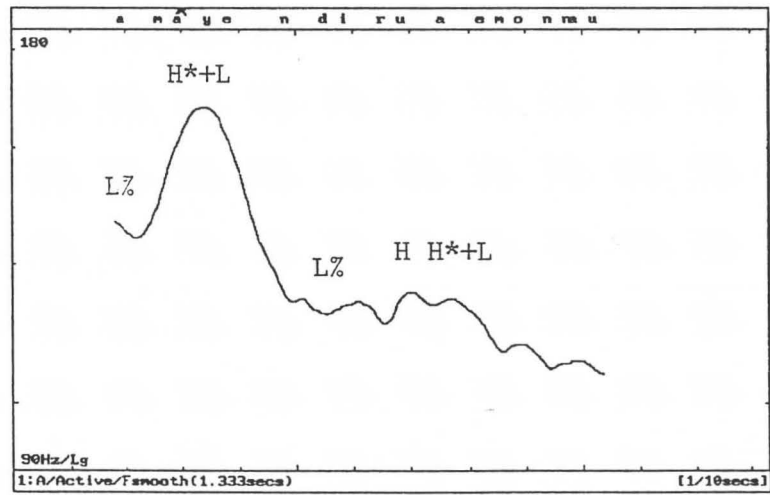
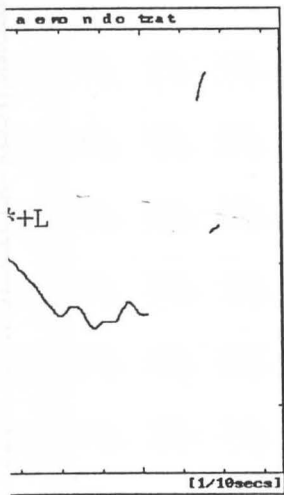


Fig. 24

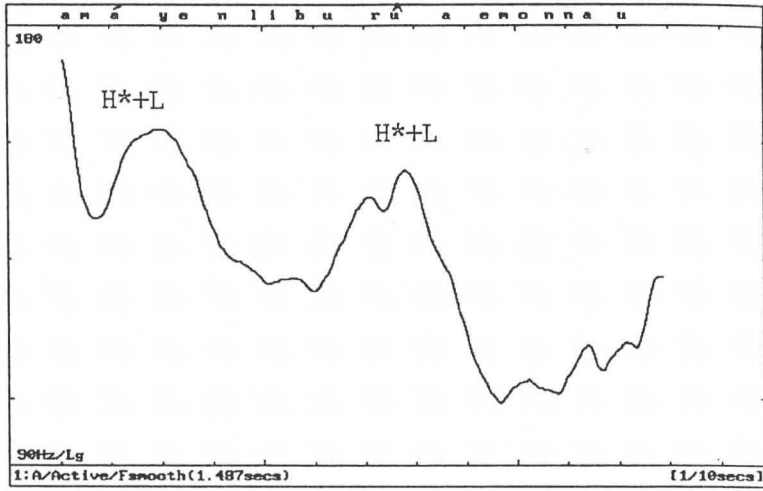


Fig. 25

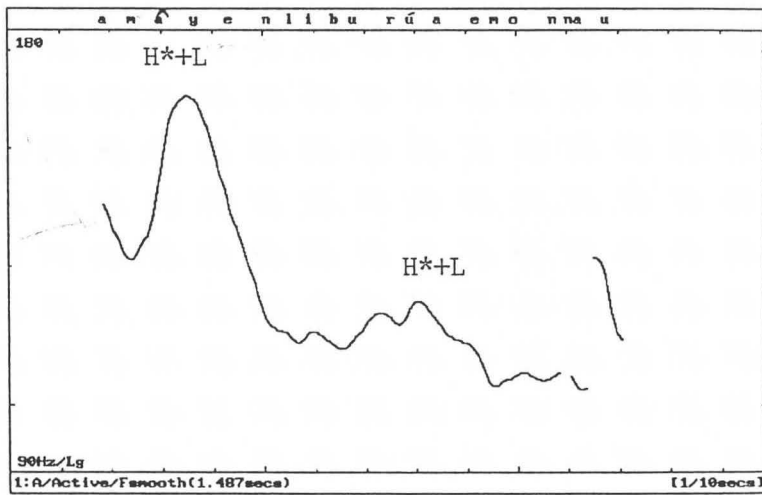
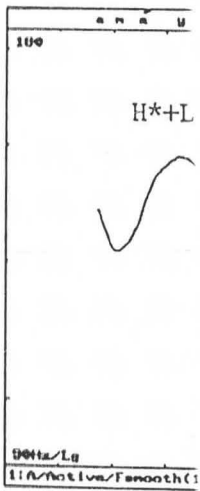
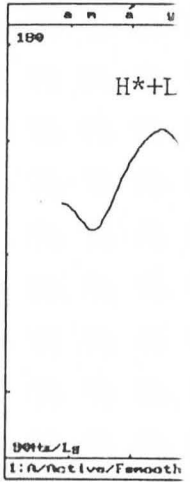


Fig. 26



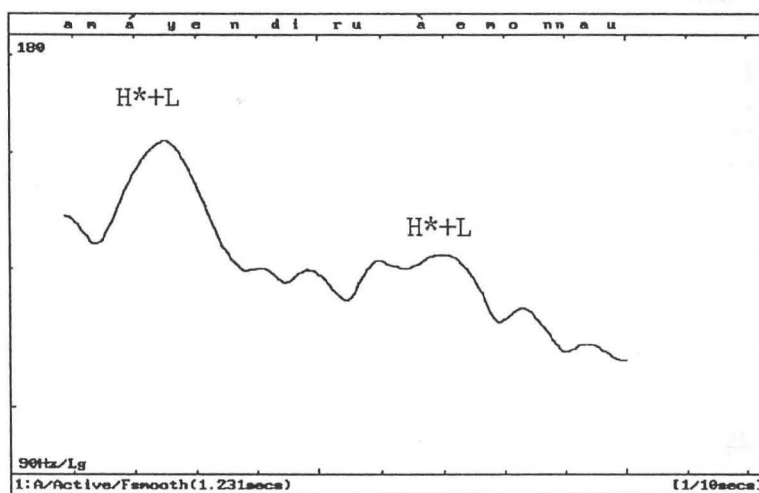
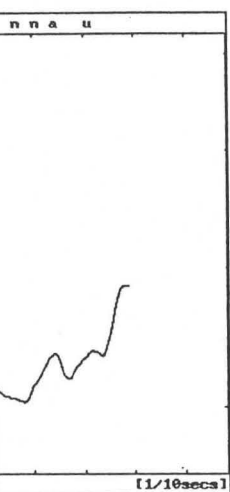


Fig. 27

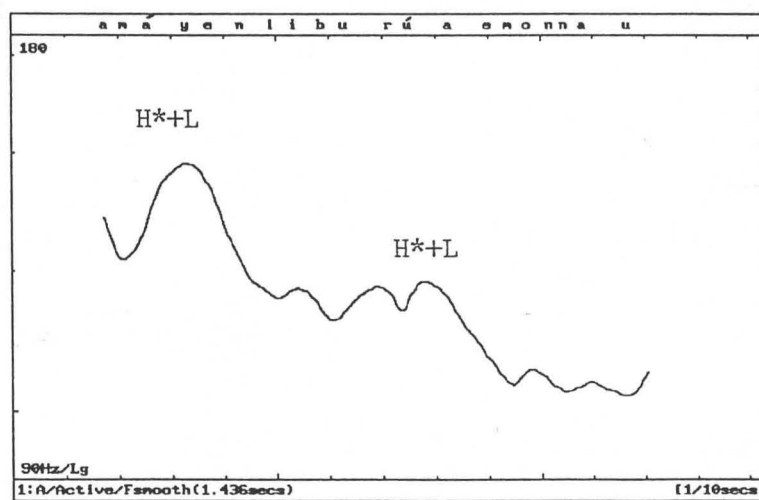


Fig. 28

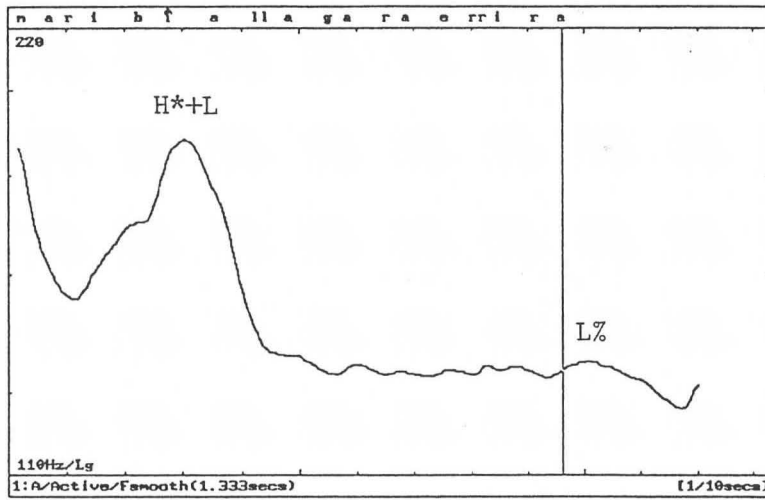


Fig. 29

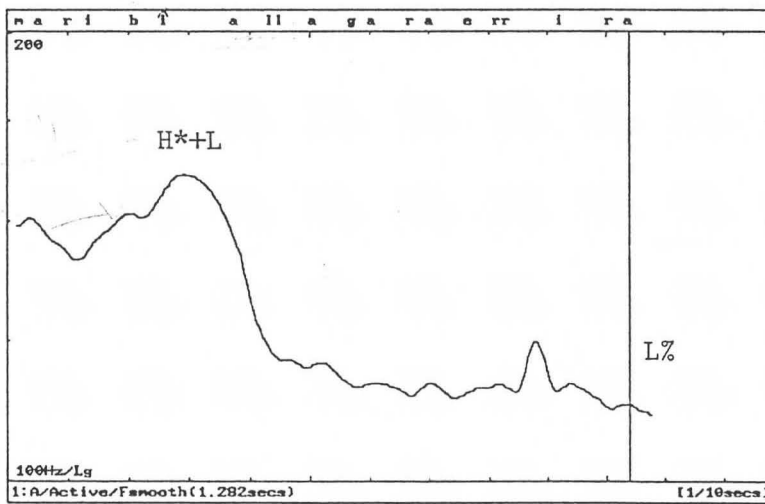
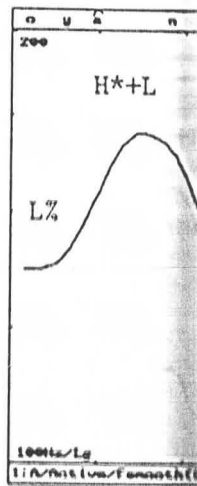
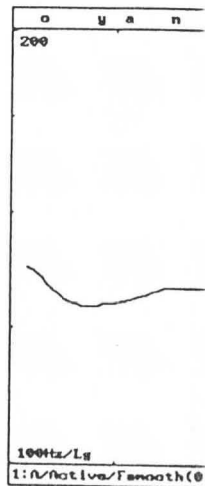


Fig. 30



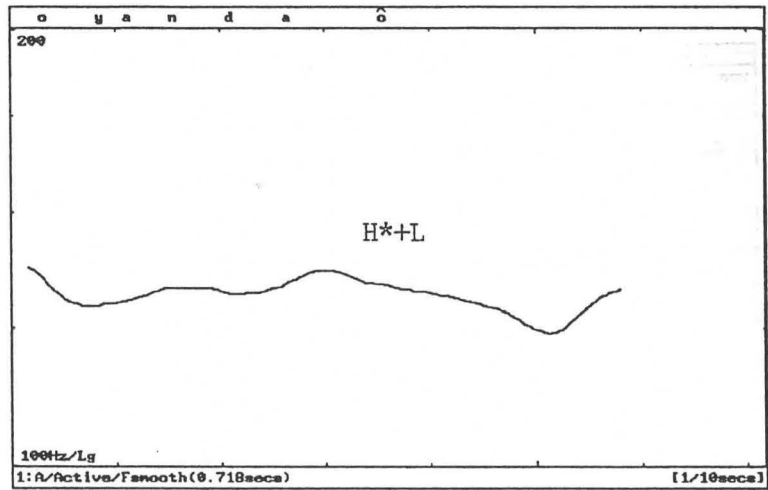
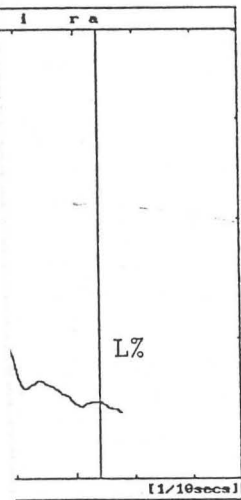
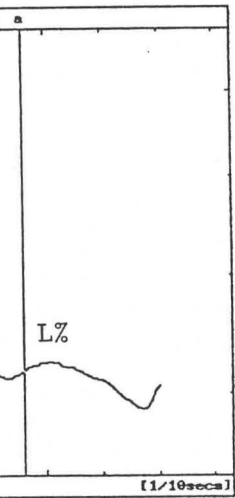


Fig. 31

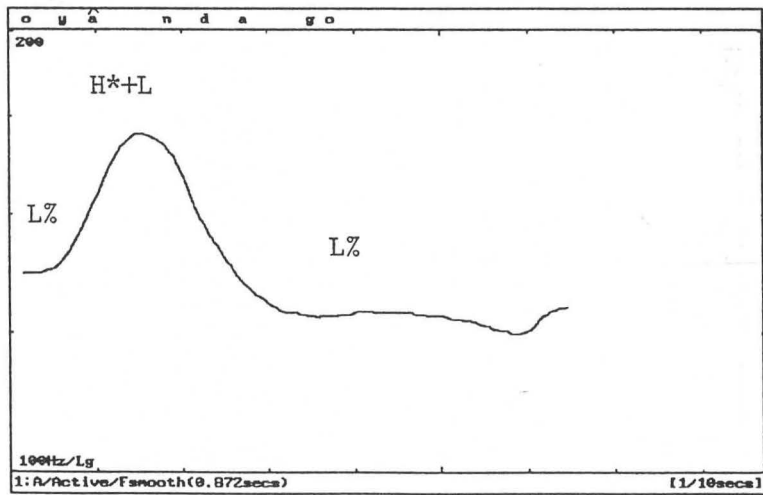


Fig. 32

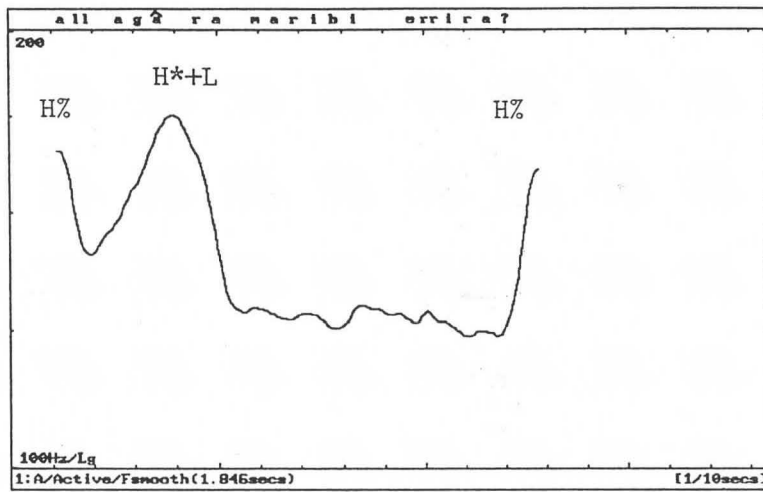


Fig. 33

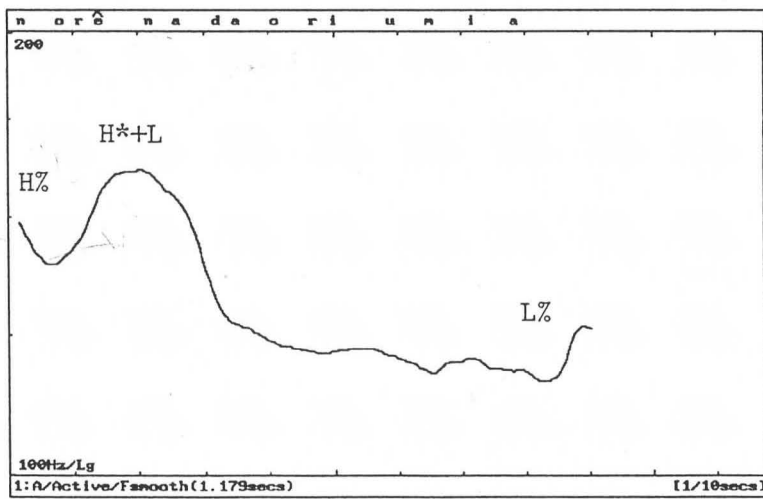
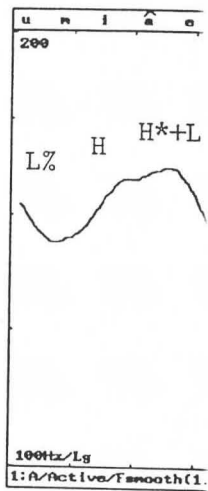


Fig. 34



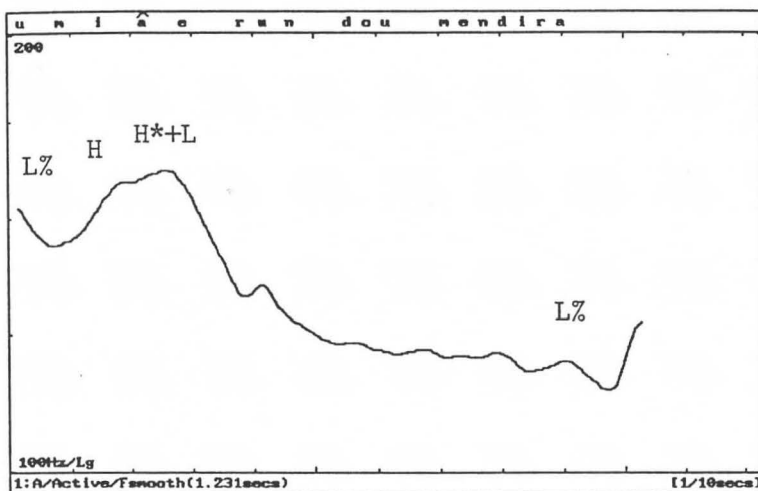
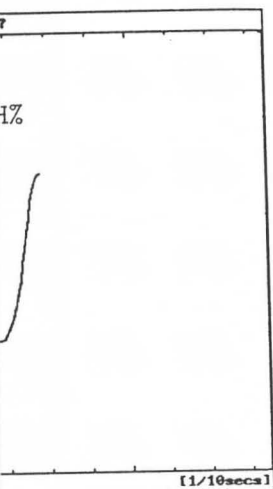


Fig. 35

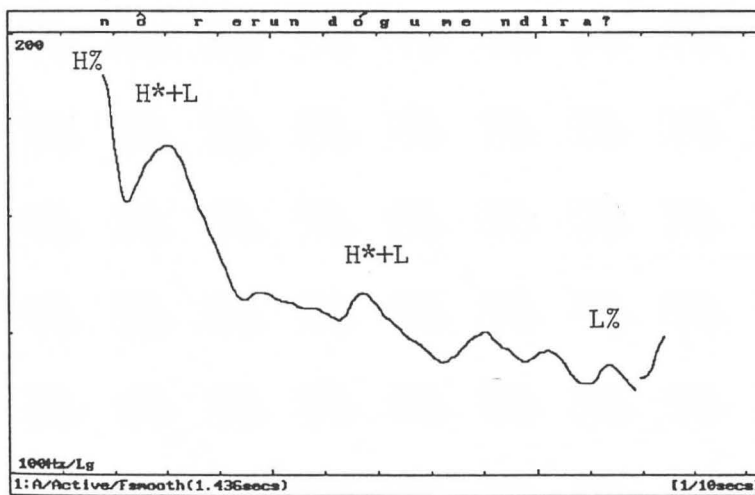
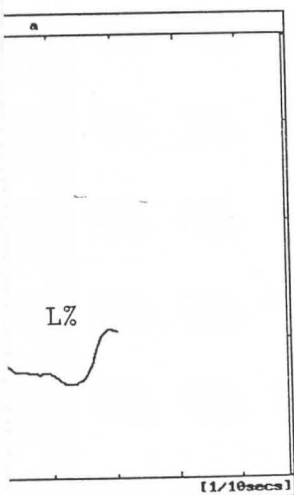


Fig. 36

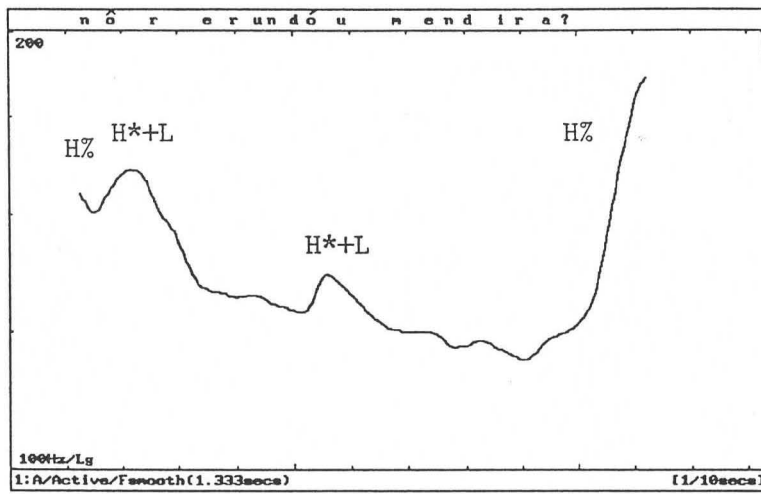


Fig. 37

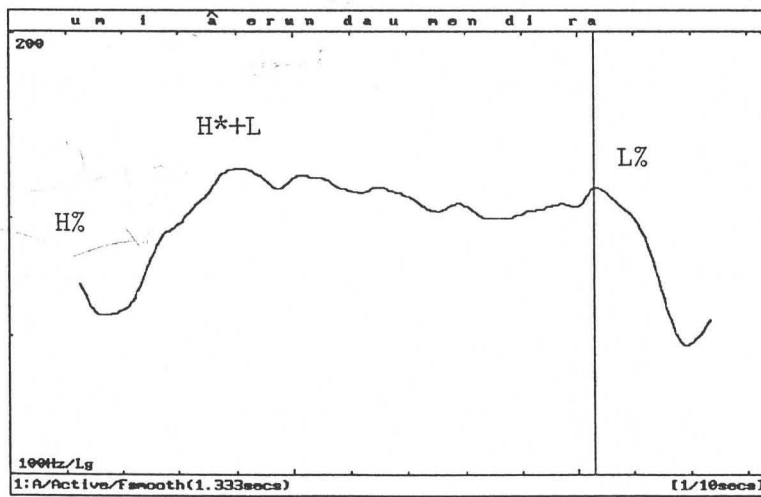
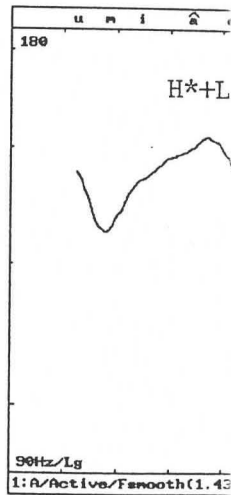
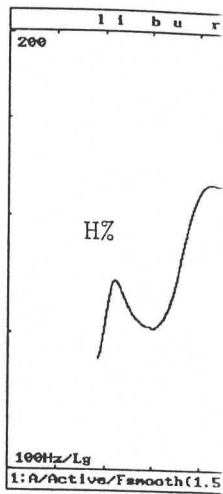


Fig. 38



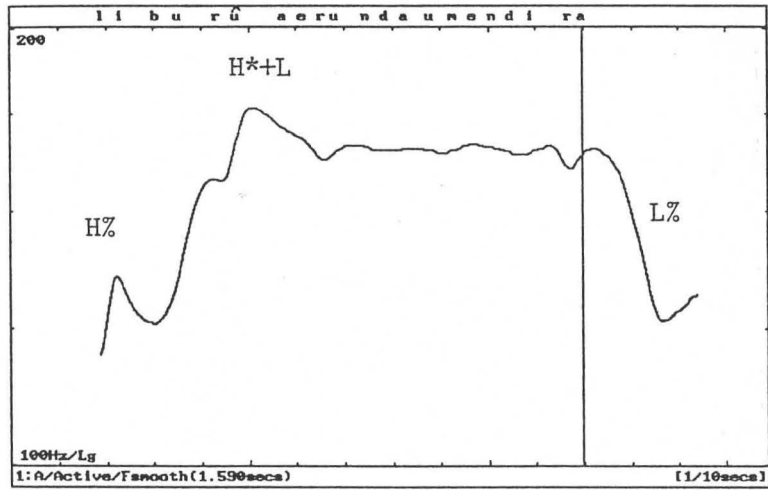
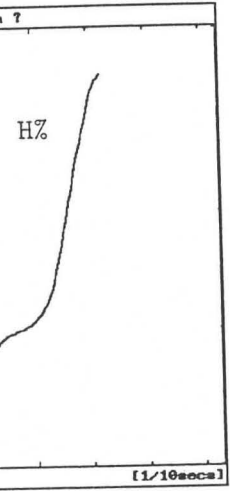


Fig. 39

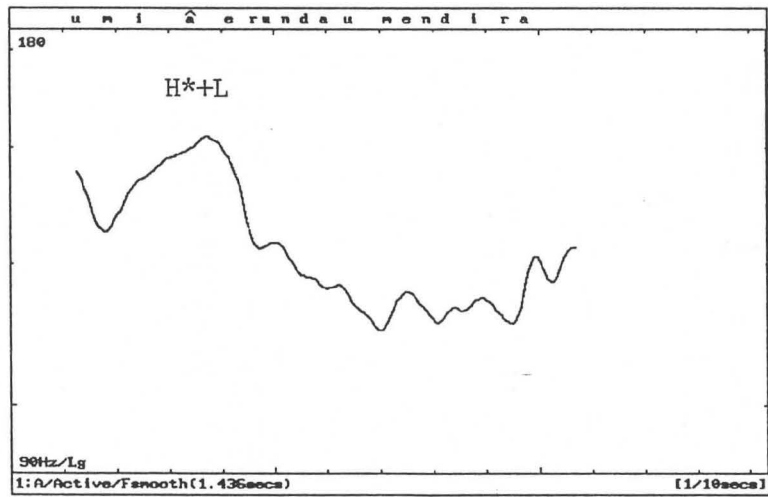
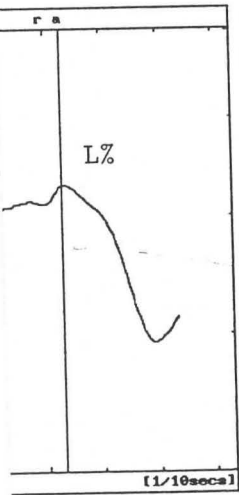


Fig. 40

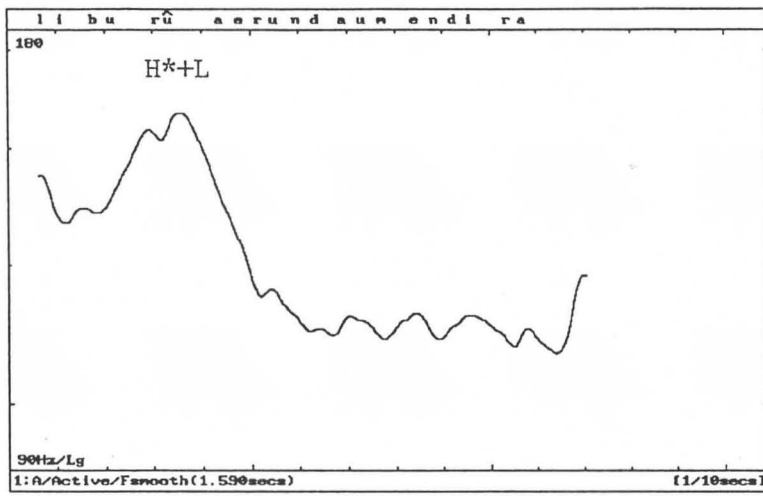


Fig. 41

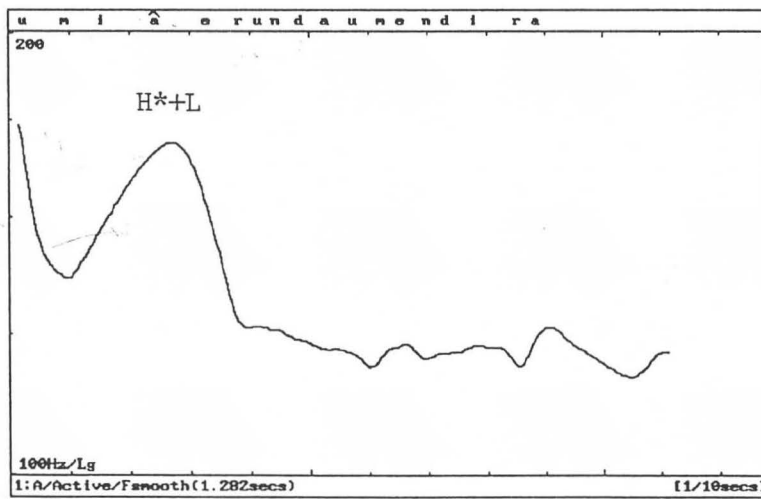
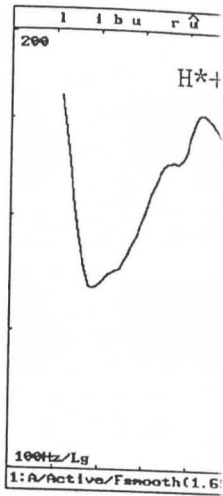
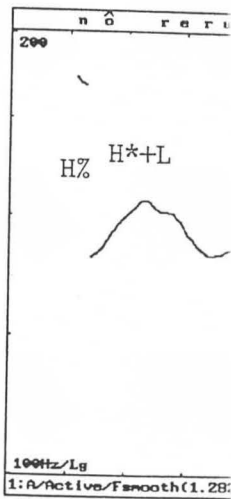


Fig. 42



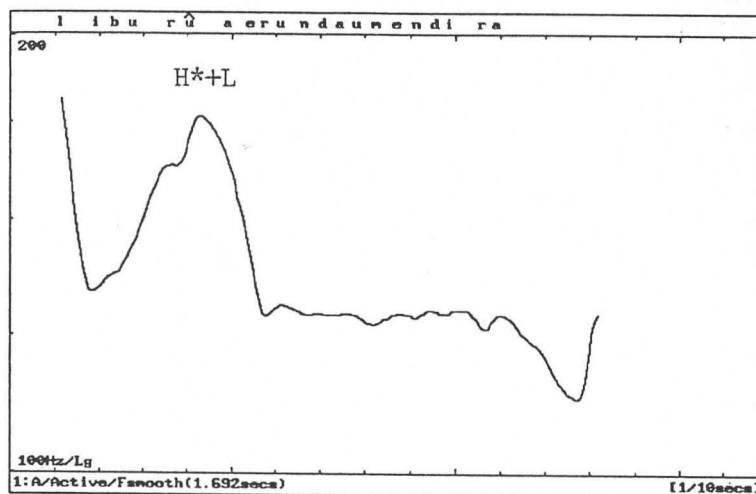
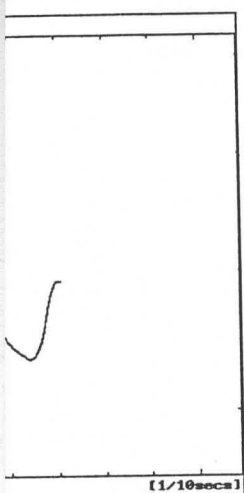


Fig. 43

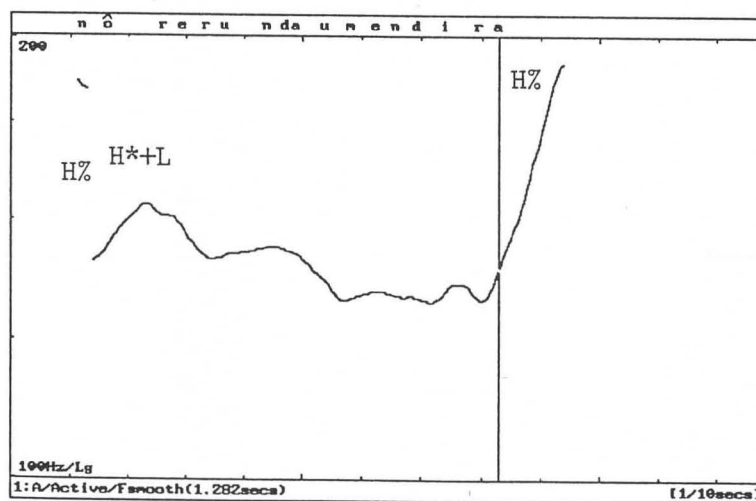
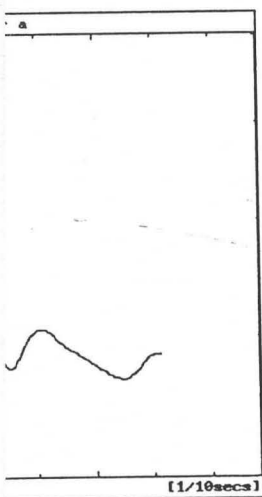


Fig. 44

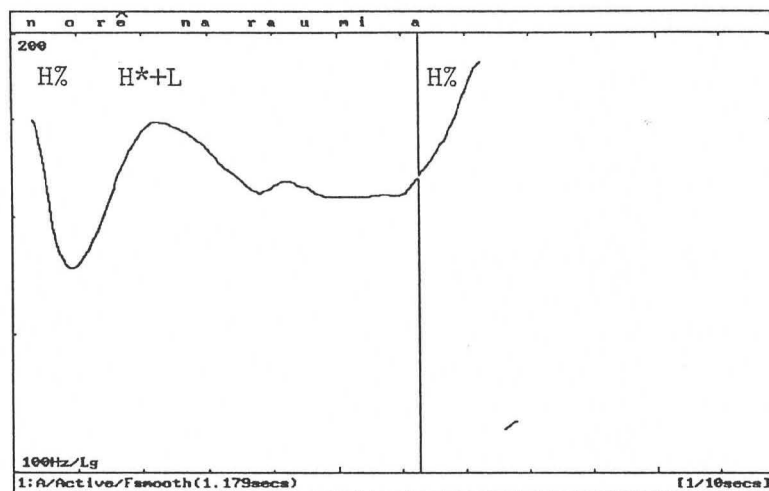


Fig. 45

Notes

* I wish to thank José Ignacio Bellido provided me with de... which ultimately led to a an i... the questions and comments re... at the University of Deusto, ... presented. I also want to thar... The usual disclaimer applies. ... the Department of Education,

1 Pierrehumbert (1980) also ... (1986) this is reanalyzed as a

2 Following Bruce's (1977) a ... (1980) identifies another kind ... This is the *phrase accent*, whi... before the boundary tone. Lik... (H⁻ and L⁻ in Pierrehumbert's ... phrase accent is reanalyzed as ... the intonational phrase, namely

3 I follow the original source ... hyphen which marks unstarred ... phrase accent notation, as in B

4 Pierrehumbert does not spec... represented in (c) could be.

5 Cf. Hualde, Elordieta and El... unaccented morphemes, as wel... of Lekeitio Basque.

6 I indicate accented morphen

7 In (3) and in subsequent exar... abbreviations are used in this ar... GEN = genitive, BEN = benefa... inesive, ALL = allative, ABL = t

8 The accentual system of Leki... although the reader should be w... accentual system. Naturally, th... researchers has demonstrated th... dialects (Larrasquet 1928, Altu... 1977, Basterrechea 1974, 1975, ... 1993bc, 1994, to appear b, Hu

Notes

* I wish to thank José Ignacio Hualde for his encouragement to write this article, as well as for his feedback on the first draft of this paper. Pilar Prieto and Paloma García Bellido provided me with detailed comments and suggestions on a pre-final version which ultimately led to an improved product, I hope. This work also benefited from the questions and comments raised by the audience at the Linguistic Colloquium Series at the University of Deusto, in the Basque Country, where parts of this paper were presented. I also want to thank Fernando Martínez-Gil for his patient editorial help. The usual disclaimer applies. This research was funded by a doctoral fellowship from the Department of Education, Universities, and Research of the Basque Government.

1 Pierrehumbert (1980) also made use of H*+H, but in Beckman and Pierrehumbert (1986) this is reanalyzed as a sequence of two single H* tones.

2 Following Bruce's (1977) analysis of Swedish intonational patterns, Pierrehumbert (1980) identifies another kind of tone occurring at the end of the intonation phrase. This is the *phrase accent*, which is located shortly after the nuclear pitch accent and before the boundary tone. Like boundary tones, phrase accents can be only H and L (H⁻ and L⁻ in Pierrehumbert's notation). In Beckman and Pierrehumbert (1986) the phrase accent is reanalyzed as a terminal tone for a prosodic constituent smaller than the intonational phrase, namely the intermediate phrase.

3 I follow the original source in including phrase accents, but I have omitted the hyphen which marks unstarred tones of bitonal pitch accents, to avoid confusion with phrase accent notation, as in Beckman and Pierrehumbert (1986).

4 Pierrehumbert does not specify what the pragmatic meaning associated to the tune represented in (c) could be.

5 Cf. Hualde, Elordieta and Elordieta (1994) for a complete paradigm of accented and unaccented morphemes, as well as a vocabulary listing of all the roots in the lexicon of Lekeitio Basque.

6 I indicate accented morphemes by writing an apostrophe before the morpheme.

7 In (3) and in subsequent examples, dots indicate syllable boundaries. The following abbreviations are used in this article: ABS = absolutive, ERG = ergative, DAT = dative, GEN = genitive, BEN = benefactive, COM/INST = comitative/instrumental, INES = inessive, ALL = allative, ABL = ablative, GEN-LOC = genitive locative.

8 The accentual system of Lekeitio was first described by Azkue (1923, 1931, 1932), although the reader should be warned that the author refers to it as the general Basque accentual system. Naturally, this is far from being true, as the work of several researchers has demonstrated the existence of different accentual types among Basque dialects (Larrasquet 1928, Altube 1934, Lafon 1935, Michelena 1958, 1972, 1976, 1977, Basterrechea 1974, 1975, Jacobsen 1978, Hualde 1989, 1990, 1991abc, 1992, 1993bc, 1994, to appear b, Hualde and Sagarzazu 1991, Jansen 1992, Gaminde and

Hualde, to appear). Cf. also Preface 2 of Hualde, Elordieta and Elordieta (1994), in which some misinterpretations resulting from Azkue's work are discussed.

9 The following abbreviations are used in (7): PLAC = place-adjective forming; COMP = comparative; SUPERL = superlative; EXCESS = excessive; FREQ = frequentative. For a complete list of derivational suffixes along with their accentual properties, see Hualde, Elordieta and Elordieta (1994: 152-162).

10 Cf. Hualde, Elordieta, and Elordieta (1994: 56, and section 3.4) for an extensive list of compound forms in Lekeitio Basque.

11 There is an alternative analysis, proposed by Hualde (1991a), which is to posit a High tone for the accented morpheme in the underlying representation, as well as the insertion of a Low tone on the syllable immediately following (i.e., the last syllable). This analysis is similar to the one Haraguchi (1977) and Poser (1984) suggest for Japanese accentuation, with the difference that the Low tone spreads rightward in Japanese, in cases where there is more than one syllable or mora following the accented mora. In Lekeitio this is impossible, because there is only one syllable after the accented one (or none, in phrase-final unaccented words, as we will see later). We choose the analysis of a H*+L pitch accent over Hualde's for reasons of simplicity: it eliminates the need to refer to two insertion rules, one for H and another one for L.

12 To be precise, Pierrehumbert and Beckman (1988) posit a separate mora tier, which contains the mora to which the lexical tone associates. Given the absence of any role played by the mora in Lekeitio Basque for metrical and tonal purposes, I omit this tier from the representation in (14).

13 The fundamental frequency contours in this paper were obtained using the speech analysis system called *Computerized Extraction of Components of Intonation in Language* (CECIL), version 2.0, developed by the Summer Institute of Linguistics. The recordings correspond to a native speaker of Lekeitio Basque.

14 From now on and for ease of exposition, I will represent the phonetic realization of lexical accents by inserting two association lines, one linking the L tone with the stressed syllable, and another one linking the L tone with the following syllable. The reader should bear in mind, however, that both tones are phonologically associated with the penultimate syllable.

15 We could also analyze this L tone as an initial L% boundary tone of the level of the utterance, and then posit a linking of this L% tone to the initial syllable of the utterance (cf. Pierrehumbert and Beckman 1988 for an analysis of Japanese tone structure along these lines).

16 I am grateful to Paloma García Bellido for helpful discussion of this point.

17 This is similar to the Accent Condition on Minor Phrasing that Selkirk and Tateishi (1988) formulate for Japanese.

18 Unlike Japanese, wh Lekeitio Basque imposes accentual phrase. One phrase, before a pitch effect is exemplified in (

- (i) L% H H
| | |
gu.re a
our si
'The old pri

19 Deaccenting of pitch observed in Japanese, Er not a universal property deaccented after the sent as well as the discussion

20 It is important to ren are those contained in th words preceding the verl they form part of the obj

- (i) [NP amáyen diru
'(S)he has given

A word not contain irrespective of whether o

- (ii) *[NP lagunák] [N
'The friend has

- (iii) *[NP lagúnak] [N
'The friends hav

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Azkue, Resurrección M. Vasca. [Reprinted in Azkue, Resurrección M. *Euskera* 4.282-318,

18 Unlike Japanese, which limits the number of words in an accentual phrase to three, Lekeitio Basque imposes no restrictions on the number of words that can appear in an accentual phrase. One can find long strings of unaccented words in an accentual phrase, before a pitch accent marking the accentual phrase boundary is reached. This effect is exemplified in (i):

- (i)
- | | | | | | | | | | | | | | | |
|-----------|-----------------|---------------|---------------|-------------|---|---|---|---|---|---|---|---|---|------|
| L% | H | H | H | H | H | H | H | H | H | H | H | H | H | H*+L |
| | | | | | | | | | | | | | | |
| g u . r e | a l . b o . k o | e r r i . k o | a . b a . d e | s a . r r a | | | | | | | | | | |
| our | side-GEN-LOC | town-GEN-LOC | priest | old | | | | | | | | | | |
- ‘The old priest from the town next to us’

19 Deaccenting of pitch accents after the nuclear stress in an utterance can be observed in Japanese, English, and Spanish, among many other languages, but this is not a universal property. In Swedish, for example, pitch accents can occur non-deaccented after the sentence stress (cf. Pierrehumbert and Beckman 1988: 246-251, as well as the discussion in section 7.1).

20 It is important to remember that the only syntactic elements that can be focalized are those contained in the phrase immediately preceding the verb. Although the two words preceding the verb in (50) and (51) constitute independent accentual phrases, they form part of the object NP preceding the verb:

- (i) [_{NP} amáyen diruà] [_{VP} emon nau]
 ‘(S)he has given me Amaya’s money’

A word not contained in the phrase adjacent to the verb cannot be focalized, irrespective of whether or not it is accented:

- (ii) * [_{NP} lagunák] [_{NP} amáyen diruà] [_{VP} emon nau]
 ‘The friend has given me Amaya’s money’

- (iii) * [_{NP} lagúnak] [_{NP} amáyen diruà] [_{VP} emon nábe]
 ‘The friends have given me Amaya’s money’

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Rules vs. constraints Basque and

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1 Introduction*

Perhaps the most important change in the last few years has been a shift from a rule-based to a constraint-based approach. Proposals along these lines (1991a, 1991b), Paradis (1993a), and the Optimality Theory model, if we judge by the current state of the field, is Optimalist. (1993a, 1993b, Prince and

The reanalysis of sonority is a nonderivational approach to the nature of the phonological constraints. It holds the view that phonological constraints are not implausible, the demonstration that the ordering can also be analyzed in a way that justifies presenting a reanalysis in any manner; simply showing that anyone who does this can be seen as what is cognitively plausible as improving on previous work and moving it into this category. In such cases, the phenomena that had been previously unaccounted for can also be accounted for in any transition. However, the current state of the field we can obtain a deeper understanding of the nature of the phonological constraints.