Intonation in a pitch accent variety of 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, 1997, 1999, Hualde and Sagarzazu 1991, Hualde and Bilbao 1993, Hualde, Elordieta and Elordieta 1993, 1994, Gaminde and Hualde, 1995, and references therein). In this pilot study I focus on the intonational system of the Bizkaian 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 downstep or catathesis applies. A syntactic maximal projection constitutes an intermediate phrase, unless it is the leftmost phrase in the sen-

* This article is a slightly revised version of Elordieta (1997), which sets the theoretical basis for the subsequent work that has been done on Basque intonation in the past two years. I want to thank the editor of *ASJU*, Joseba A. Lakarra, for the continuous interest he has showed in getting this work on intonation published in *ASJU*, so that it can be accessed by the linguistic community in the Basque Country more easily. Thus, the references to the work on Basque intonation since 1997 do not appear mentioned in the body of the article, although I must mention them here (see references page): Jun and Elordieta (1997), Gaminde (1997), Elordieta et al. (1999) and Elordieta (in press a,b). The present article contains as its major revision the different analysis proposed in section 5.1, which signifies an improvement over the previous version. I want to thank José Ignacio Hualde for his constant encouragement and feedback over the past years on all my work on intonation. The usual disclaimer applies.

tence and it contains only one accentual phrase, in which case reanalysis applies. Finally, there is the level of the intonation phrase, 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 extratonality 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 towards 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 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 into-

nation is thus 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 (F0) contour, F0 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 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, 2] 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 place where stress falls (i.e., the accented syllable, not the pitch accent) is the only information which is lexically specified. A stress-bearing lexical item in English can thus be pronounced in as many as six tonally different ways, corresponding to the six different pitch accents available in the grammar.

To the pitch accents we have to add the boundary tones, which do not line up with metrically strong syllables. They occur at the end of the intonational phrase, after the last pitch accent (i.e., the nuclear accent, following Chomsky and Halle's 1968 terminology), and are responsible for the raising or falling contour endings of utterances. They can only be single tones, not bitonal, unlike pitch accents; that is,

(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) In the *Tone and Break Index Framework* (ToBI), developed by Silverman et al.(1992) and Beckman and Ayers (1994) for English, the H*+L pitch accent is rewritten as H*, under the reasoning that there is no phonetic distinction between these two tones, i.e., that there is no immediate sharp drop in pitch after the H*. In order to maintain the distinction between H* and Pierrehumbert's (1980) H*+L, namely the fact that H*+L triggers downstep on a following H tone whereas H* does not, the old H*L is rewritten as H* which triggers downstep, indicated by writing !H* on the downstepped accent. That is, H*+L is rewritten as H*...!H*. For western Basque pitch accent dialects, however, H*+L should be maintained as the correct notation for the pitch accent, because of the sharp pitch drop after the accented syllable. This is more clearly observed in the Getxo-Gernika type, where the accented syllable may occur two or more syllables from the end and the drop falls immediately on the following syllable, as shown in Elordieta et al. (1999) (where, incidentally, the H* of the pitch accent should rather be notated as H*+L).

there can only be L and H boundary tones, which in this framework are referred to as L% and H%.[3]

This architecture of intonation means that the same text in English could have different melodies, depending on the pitch accents and boundary tones that the speaker chooses to assign to it. Each tune or melody will have a different semantic or pragmatic meaning associated to it. For example, Pierrehumbert (1980: 146-147) posits five different melodies for the word *Anna*, uttered in isolation:[4] (a) H* L⁻L%; (b) H* L⁻H%; (c) H*+L⁻ H⁻ L%; (d) L*+H⁻ L⁻ H%; (e) L* H⁻H%. Pierrehumbert states that (a) and (b) could be used as answers to a question, (b) carrying an implication that the answer is incomplete; (d) serves to convey incredulousness, or that the speaker is giving only one of many possible examples; (e) is a common melody for the question *'Is it Anna?'*.[5] Other languages may have a smaller inventory of pitch accents. For example, Swedish has two contrasting shapes, H*+L and H+L*, which as the star notation shows differ in which tone aligns with the word stress. Unlike the pitch accents in English, however, the two pitch accents in Swedish are not part of an inventory of contrasting pitch accents made available to the speaker to convey different meanings. Instead, the choice of one or the other accent type is given as part of the phonological specification of the individual lexical item. For example, the word *lä'ngre* 'longer' is lexically specified as having H+L* accent (accent 1, in Bruce's 1977 terminology) and can only have this pitch accent, whereas *lå`nga* 'long, tall' is specified lexically as having H*+L accent (accent 2). The location of the accent is also lexically contrastive, i.e., two words may differ minimally in the syllable where the accent falls.

Tokyo Japanese only has one type of pitch accent, 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, 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.

(3) 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.

(4) 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).

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

For the purposes that interest us in this paper, we can advance that 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

First of all, a note of clarification regarding the terminology used in this section and in the article in general is in order: due to the fact that we are dealing with a pitch accent variety, we avoid the use of the term *stress* to refer to relative prosodic prominence, so as to avoid any associations with stress-type languages such as English or Spanish (Beckman 1986). Rather, we use the more generic term *main prominence*, or *pitch accent,* to avoid any confusion.

In Lekeitio Basque, as in Japanese, words can be accented or unaccented. Unaccented words receive final accentuation only in phrase-final position, otherwise they surface prosodic prominence. Accented words have penultimate stress, triggered by accented morphemes, i.e., morphemes which are specified in the lexicon as assigners of prosodic prominence on the penultimate syllable of 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 notation:[6]

(1)	*ama*	'mother'	*erloižo*	'watch'
	euli	'fly'	*etxe*	'house'
	itturri	'fountain'	*lagun*	'friend'

(2) a. *pre.si.dén.te* (< Sp. *presidente*) 'president'
ar.bó.la (< Sp. *árbol*) 'tree'
ma.kí.ña (< Sp. *máquina*) 'machine'
bo.li.grá.fo (< Sp. *bolígrafo*) 'pen'
lé.ku (< Lat. *locus*) 'place'

b.	*áu.rre*	'front'	*bés.te*	'other'
	á.tze	'back'	*é.gi*	'truth'
	mái	'table'		

(6) Cf. Hualde, Elordieta and Elordieta (1994: § 2.8) 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).

2.1. Accented words

The accentual system of Lekeitio Basque presents an interesting difference from other Western Basque dialects with respect to its accentual system. 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, 1997, 1999, Hualde and Bilbao 1993). For instance, the plural morphemes /-'ak/ and /-'ata/, the comitative/instrumental /-'gas/ and the ablative /-'tik/ are accented morphemes (which Hualde calls 'preaccenting').[7] That is, they assign prosodic prominence (realized by a pitch accent, cf. §3) to the syllable immediately preceding the one they are included in. Thus, we have *sa.ga.rra* 'the apple, abs. sg.' or *sa.ga.rre.ra* 'to(wards) the apple', but *sa.gá.rrak* 'the apples, abs.pl.', *sa.gá.rran.tza.ko* 'for the apples'.[8]

When there is more than one accented morpheme in a word, the leftmost accented morpheme that determines the location of the prosodically prominent syllable. For instance, 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 *sagárratatik* is /sagarr-'ata-'tik/. This is also observed when the lexical root and one or more suffixes are accented. The accent carried by the lexical root eliminates the effects of the other suffixes; all the forms will surface with main prominence on the syllable underlyingly specified to bear the accent. Thus, for the root *lé.ku* 'place', all words derived from suffixation will bear accent on the first syllable: *lé.ku.e* 'the place, abs. sg.', *lé.ku.e.ri* 'to the place', *lé.ku.e.ta.tik* 'from the places', *lé.ku.e.ta.ra* 'to the places'.

In Lekeitio Basque, however, when a word contains an accented morpheme, be it a root or a suffix, the penultimate syllable is always assigned a pitch accent. 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 belongs lexically 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' illustrates this pattern:[9]

(7) I indicate accented morphemes by writing an apostrophe before the morpheme.

(8) The following abbreviations are used in this article: Abs = absolutive, Erg = ergative, Dat = dative, Gen = genitive, Ben = benefactive, Com/Inst = comitative/instrumental, Ines = inesive, All = allative, Abl = ablative, Gen-loc = genitive locative.

(9) 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), where some misinterpretations resulting from Azkue's work are discussed.

(3)	Indefinite	Singular	Plural
Abs	*sa.gar*	*sa.ga.rra*	*sa.gá.rrak*
Erg	*sa.gar*	*sa.ga.rra*	*sa.gá.rrak*
Dat	*sa.ga.rre.ri*	*sa.ga.rra.ri*	*sa.ga.rrá.ri*
Gen	*sa.ga.rren*	*sa.ga.rren*	*sa.gá.rren*
Ben	*sa.ga.rren.tza.ko*	*sa.ga.rren.tza.ko*	*sa.ga.rren.tzá.ko*
Com/Inst	*sa.ga.rré.gas*	*sa.ga.rrá.gas*	*sa.ga.rrá.kiñ*
Ines	*sa.ga.rre.tan*	*sa.ga.rri.an*	*sa.ga.rré.tan*
All	*sa.ga.rre.ta.ra*	*sa.ga.rre.ra*	*sa.ga.rre.tá.ra*
Abl	*sa.ga.rré.tik*	*sa.ga.rré.tik*	*sa.ga.rre.tá.tik*
Gen-loc	*sa.ga.rre.ta.ko*	*sa.ga.rre.ko*	*sa.ga.rre.tá.ko*

The peculiarity of this accentual system is best observed in cases where we find an accented lexical root followed by unaccented suffixes; the penultimate syllable of the word surfaces with a pitch accent. Let us take the inflectional paradigm of an accented root such as *léku* 'place', for the sake of comparison with the Gernika type:

(4)	Indefinite	Singular	Plural
Abs	*lé.ku*	*le.kú.a*	*le.kú.ak*
Erg	*lé.kuk*	*le.kú.ak*	*le.kú.ak*
Dat	*le.kú.ri*	*le.ku.á.ri*	*le.ku.á.ri*
Gen	*lé.kun*	*le.kú.en*	*le.kú.en*
All	*le.ku.tá.ra / le.kú.ra*	*le.kú.ra*	*le.ku.e.tá.ra*
Abl	*le.ku.tá.tik / le.kú.tik*	*le.kú.tik*	*le.ku.e.tá.tik*

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/, the frequentative /-'ro/ or the diminutive /-'txu/ (i.e., *kalétar* 'town dweller', *mar.kí.ñar* 'from Markina (town name)', *beruágo* 'hotter', *andížen* 'biggest', *otzégi* 'too cold', *egunéro* 'everyday', *nes.ká.txu* 'little girl'). See Hualde, Elordieta and Elordieta (1994: 152-162) for a complete list of derivational suffixes with their accentual properties.

If we add more suffixes to the complex formed by a root and an accented derivational morpheme, we obtain a pattern similar to the one observed for accented roots (cf. (4)). 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. For instance, *nes.ka.txu.a.gá.na* 'towards the little girl', *an.di.že.ná.ri* 'to the biggest one'.

Compounds also receive penultimate accent, even though the members of the compound in isolation are unaccented roots. Compare for instance the accentuation of the compound adjective *buru-gógor* 'stubborn' with the one corresponding to the nouns *buru* 'head' and *gogor* 'hard' in a non-compound sequence within a noun phrase: *buru gogor* 'hard head' (see Hualde, Elordieta and Elordieta 1994: 56, and § 3.4 for an extensive list of compound forms in Lekeitio Basque).

As Hualde (1999) 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 dis-

placement, 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:

(5) a. Line 0 elements are syllable-heads.
b. Mark the final syllable extrametrical.
c. On line 0, construct an unbounded, right-headed constituent and mark its head on line 1. (LINE 0: [-BND, R])
d. On line 1, construct an unbounded, right-headed constituent and mark its head on line 2. (LINE 1: [-BND, R])

The way these rules work is illustrated in (7) for the word *mendižetátik* 'from the mountains', which contains two accented morphemes, the plural determiner /-'eta/ (used for locative cases) and the ablative /-'tik/, as represented in the underlying representation in (6):

(6) /mendi-'eta-'tik/
mountain-det.pl.-abl.

(7)
Line 2 *
Line 1 (*)
Line 0 (* * * *) <*>
men di že ta tik
mendižetátik

2.2. Unaccented words

As already mentioned at the beginning of this section, unaccented words do not carry prosodic prominence unless they are located in phrase-final position; more precisely, if they are the last word in a phrase which immediately precedes the verb. Thus, unlike accented words, which present prosodic prominence as a lexical property of the word, that is, as a prosodic feature of an accented morpheme in a word, unaccented words in Lekeitio Basque may receive prosodic prominence only by virtue of their position in a phrase and the position of that phrase in the sentence. We could thus refer to prominence in unaccented words as a type of phrasal level accent, as opposed to a word-level accent. Phrasal accent is realized on the last syllable of the word. The example in (8) illustrates this pattern, with phrasal accent indicated by an acute mark on the relevant syllable:

(8) *zure herriko alkatiá ikusi dot*
your town-of mayor-sg. see aux.
'I have seen the mayor of your town'

In this example, the phrase *zure herriko 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 §§ 3.3 and 5.1 for a discussion on this matter).

The specification that phrasal accent 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 accent. 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:

(9) L H H H H H H HH
| | | | | | | | |
zu.re he.rri.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 carries the main prosodic prominence in the sentence. This rule is provisionally stated in (10):

(10) 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, i.e., after the operation known in the current minimalist framework as SPELL-OUT has taken place (cf. Chomsky 1993, 1994). 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

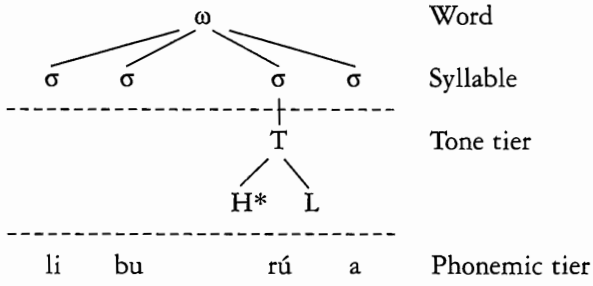
3.1. Lexical H*+L pitch accent

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 syl-

lable.[10] 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. The 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 (5).[11] This can be represented as in (12), 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 (11):

(11) /'liburu-a/
book-det.sg.

(12)



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 below, for the word *amúma* 'grandmother', whose phonological representation is given in (13):[12]

(10) 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.

(11) 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 (12).

(12) The fundamental frequency contours in this paper were obtained using the speech analysis system *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.

(13) H*+L
|
a.mú . ma

3.2. Tonal pattern of phrase-final prominence

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. Although Elordieta (1997) claimed that in unaccented words the H*+L pitch accent is realized as a contour tone on the final syllable, Jun and Elordieta (1997) show that the L is realized on the first syllable of the next word. Thus, in (14) below, where the phrase *nire amen dirua* 'my mother's money' is composed entirely of unaccented words, prosodic prominence in the phrase falls on the word *dirua* 'the money', located in final position of the phrase. The tonal implementation of this phrasal accent is H*+L, where the last syllable is linked to the H* and the L is realized on the first syllable of the verb (cf. Figure 2):

(14) 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 ends a phrase located immediately before the verb, there is no accent on the last syllable of that word apart from the lexical accent that falls on the penultimate syllable of any accented word. These facts may indicate that the phrase-level accent on the final syllable of the word preceding the verb is not inserted when the word is accented, as if a lexical accent were a sufficient indicator of phrase-level accent on the rightmost word of the phrase preceding the verb. Or alternatively, that phrase-level accent is inserted on the last syllable of the word, but a stress-clash situation would arise with the lexical accent on the penultimate syllable, and the phrase-level accent gets deleted.

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):

(15) L H H H H*+L
| | | | |
li. bu. ru .e. ná .ri

If the accented word is bisyllabic, and thus 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):[13]

(16) H*+L
|
mó. no

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 (5) 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. (15)) would serve to illustrate this:

(17) L% H*+L
| ⇢ |
li . bu . ru . e. ná . ri

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 (18), 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):

(18) a. L% H H H H H*+L
| | | | | | |
la . gu . nen di . ru . á 'the friend's money'

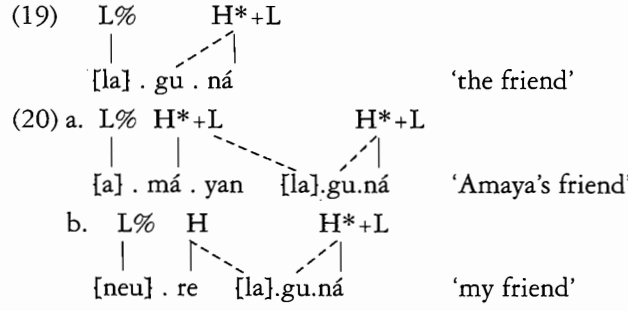
b. L% H*+L L H H*+L
| | | | |
la . gú . nen di . ru . á 'the friends' money'

Hualde tries to account for the initial H tone on *dirua* in (18a) 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.

(13) The pitch accents will be linked by association lines with the syllable they phonologically belong to, although the reader should bear in mid that phonetically the H* tone is linked to the stressed syllable and the L tone is linked to the following syllable.

(18b)). 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 (16) 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 (17)-(18)) 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 extratonality. 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 (19) *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). In (20) 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 (20a), and H in (20b) (in these and subsequent examples, square brackets are used to indicate extratonality):



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 left-

ward H tone spreading applies, and a second one in which the initial syllable loses its extratonality, 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 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 get 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, 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. It is the tone that is responsible for the rise in pitch that occurs on the second mora of accentual phrases. 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 F_0 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 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.

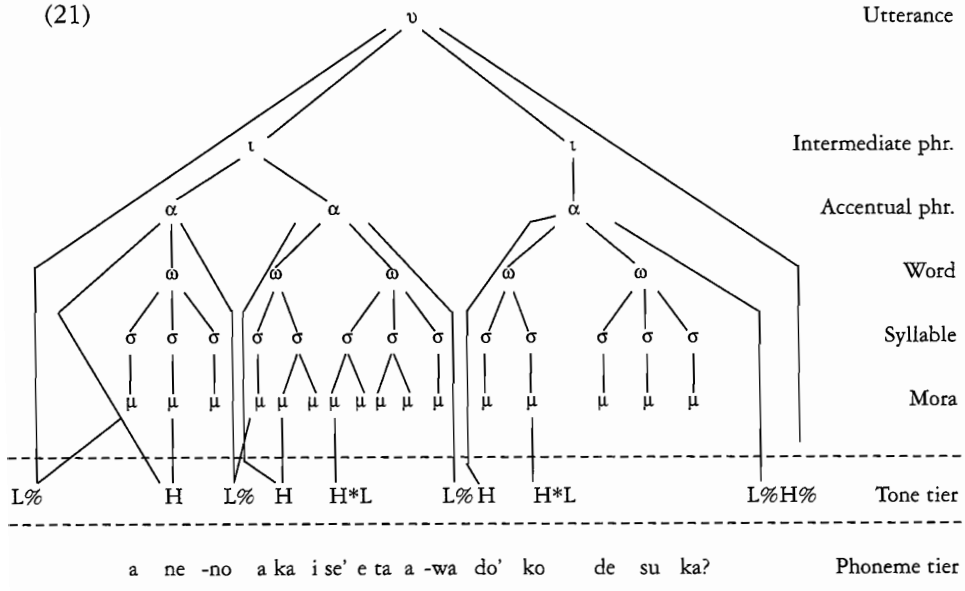
The intermediate phrase is also the domain of catathesis or downstep, a phonetic rule of tonal implementation that reduces all tones triggered by particular tone sequences on the tone tier. Catathesis has to be distinguished from declination, which is a phonetic process of gradual backdrop or reduction 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. At an intermediate phrase boundary, the pitch range is reset at a new value and downstep is blocked or stopped. Thus, downstep 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):

(21)



As we see in (21), 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 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, 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 (henceforth AP). We observe that in an utterance there is an intonational pattern that repeats itself: as illustrated in (20a,b) above, a low tone appears associated to the initial syllable of an utterance and the initial syllable of a word following a word with a pitch accent on its penultimate or final syllable (although we will see below that a pitch accent is not always necessary to have a L tone on a word-initial syllable). Then, there is a rise in pitch onto the second syllable, which may stretch over a number of syllables in the word or even across words. This H tone stretch ends when a H*+L pitch accent is met, because then a L tone will be linked to the initial syllable of the next word. Then there is a rise again on the second syllable of that word, which may be maintained onto the following syllables, and thus the cycle starts again. This is observed in the F0 contour of the following utterance (cf. Figure 7):

(22)

	H*+L	H*+L	H*+L
nire arrebien	laguná .ri	geure diru.á	emon dotzá.te.
my sister-gen.sg.	friend-gen.pl.	our money-sg.	give aux

'I have given our money to my sister's friends'

The F0 contour shows that there is a rise in pitch from the first syllable (i.e., *ni.*) to the second syllable, and this high tone is maintained across all the syllables of the word *arrebien* and the next word *lagunári*, until the accented syllable of this word (i.e., until the syllable *.ná.*). The pitch level falls on the last syllable of this word (i.e., *.ri*), due to the low tone which is part of the H*+L pitch accent, but the first syllable of the next word, *geure* (i.e., *geu.*), also displays a low tone. Then, the second syllable of this word displays a rise in pitch, which after reaching its target value is maintained on the syllables of the next word until an accented syllable is met (i.e.,

the last syllable in *diruá*). Thus, the cycle formed by the sequence of tones [L H H*+L] occurs twice in this utterance.

We argue that each cycle or each portion of the utterance associated to the tones [L H H*+L] constitutes an accentual phrase (AP). An AP in Lekeitio Basque may contain one or more words, and is composed or signaled by the following tones: an initial or left-edge %L boundary tone, a phrasal H tone associated to the second syllable which is responsible for the rise in pitch on this syllable, and in most occasions its right edge is marked by a H*+L pitch accent, whether lexical (i.e., belonging to an accented word, as in *lagunári* in (22)) or derived (i.e., realized on an unaccented word which is immediately preverbal, as in *diruá* in (22)). The phrasal H has the same status as the phrasal H on the second sonorant mora of Tokyo Japanese (cf. § 4); it belongs phonologically to the level of the AP, and is phonetically realized on the second or third syllable of an AP (see § 5.1.1). The only tones that are a property of the word are the lexical pitch accents; all the other tones (%L, phrasal H and even the derived H*+L of preverbal unaccented words) belong to higher levels of the prosodic structure of the utterance, that is, to the hierarchically organized intonational structure of the utterance. Although they are realized on actual syllables of words, they are tones that belong phonologically to the AP, the immediately higher intonational constituent above the word (cf. the structure in (21)).

As we can see, the intonational shape of APs in Lekeitio Basque is very similar to that of APs in Tokyo Japanese, as proposed by Pierrehumbert and Beckman (1988). However, there are some differences as well. First of all, unlike in Tokyo Japanese, the %L boundary tone linked to the first syllable in the AP 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 AP. Second, although APs have at most one pitch accent, like in Japanese, in Lekeitio Basque there is no possibility of having two pitch accents in an accentual phrase underlyingly and deleting one of them to satisfy the constraint on the maximum amount of accents in an AP. That is, the constraint is satisfied by the underlying representation in Lekeitio Basque. This constraint could be formulated as in (23):

(23) *Accent Condition on Accentual Phrases*
An AP may contain at most one pitch accent[14]

Third, Lekeitio Basque imposes no restrictions on the number of words that can appear in an AP, unlike Japanese, which limits the number of words in an AP to three. In Lekeitio one can find long strings of unaccented words in an AP, before a pitch accent marking the AP boundary is reached. We will provide examples in section 5.1.1.

With these characteristics of Lekeitio Basque APs in mind, we are now in a position to offer an alternative solution to the distribution of tones on syllables which do

(14) Following current standard notation conventions, we use the '%' sign to the left of the tone (i.e., %L or %H) when it corresponds to a phrase-initial boundary tone, and the '%' sign to the right of the tone when it is a right-edge boundary tone (i.e., L% or H%).

not have a lexical or derived pitch accent, that is, the issue Hualde tried to account for but which needs a more satisfying explanation.

5.1.1. Phrasal H and tone spreading

I agree with Hualde (1991a) that the H tones appearing on syllables not associated with pitch accents are not a lexical property of those syllables, and that they originate from the spreading of a high tone somewhere else in the word. However, I claim that there is no leftward spreading of the accentual H* tone occurring on the penultimate or final syllable of a word carrying a H*+L accent (cf. § 3.2-3.3). Rather, the high tones originate from a rightward tone spreading from a phrasal H tone up to the H*+L pitch accent. As we stated above, the phrasal H is a tone which phonologically belongs to the AP and is linked to the second syllable of the AP, much like the phrasal H of Tokyo Japanese links to the second sonorant mora of the AP. Phonetically, the peak of this H tone is reached on the second syllable in short APs (not longer than three or four syllables), but tends to be realized towards the end of the second syllable or beginning of the third in longer APs (five or six syllables). In APs of more than six syllables, the peak of the phrasal H tends to be realized on the third syllable. That is, the phrasal H will tend to be realized on the second syllable the closer the H*+L accent is from the %L, and it will tend to be realized on the third syllable the farther away from the %L the H*L pitch accent is (cf. Jun and Elordieta 1997).

The empirical evidence in favor of positing such a process of tone spreading from the phrasal H to the H*+L accent rather than a process of leftward spreading from the H* of the pitch accent is the fact that some APs may not contain a H*+L pitch accent. That is, some APs may have the H tone plateau extending from the second syllable to the last syllable, without a H*+L pitch accent. This pattern is observed in utterances composed of sequences of unaccented words, included in the same syntactic phrase or in separate syntactic phrases. Observe for instance the F0 contour for the utterance in (24), illustrated in Figure 8.

(24) nire lagunen alabia umiari biberoya
my friend-gen.sg. daughter-abs.sg. child-dat.sg. feeding-bottle-abs.sg.
emóten jun da
give-imperf. go aux
'My friend's daughter has gone to bottle-feed the baby' (lit. 'to give the feeding-bottle to the baby')

This utterance is composed of unaccented words in its entirety before reaching the verb. Some speakers may pronounce this kind of utterances with a single high tone plateau until the end, but others divide the utterance in two or more APs. Between the word *alabia* 'the daughter' and the word *umiari* 'to the baby' there is a drop in pitch level, that is, the first syllable of the word *umiari* has a lower tone than the tone level with which *alabia* ends. After this fall, however, there is a rise in pitch onto the second syllable of *umiari*, and this level is maintained until the pitch accent with which the phrase ends (the accented subordinate verb *emóten*). The drop in pitch indi-

cates that there is a fall from H to L, and the rise indicates that there is a rise from L to H. Thus, we have two APs, because each AP is characterized by a rise from L to H. Anytime we have a pitch rise from the first syllable of a word to the second syllable, we know that is the left edge of an AP. The L tone between the two APs represents a small drop in pitch, that is, it is undershot, much like the weak L% of Tokyo Japanese (cf. Pierrehumbert and Beckman 1988).

But then, in (24) we have a boundary between two APs without there being a H*+L pitch accent in the first AP. This indicates that APs are not always marked on their right edge by a H*+L pitch accent, and that the H tone level that appears from the second syllable to the right cannot be the result of leftward spreading from a H* tone of a pitch accent. Thus, the H toned portions of the utterance without pitch accents inherit the H tone from another source, and we argue that this is a H tone that is a feature of the AP and is phonologically associated to the second syllable of an AP. By a process of rightward spreading, the H tone is spread to the other syllables to the right until a new AP starts, filling the tonally underspecified portions of the utterance. This H tone is thus very similar to the phrasal H of Tokyo Japanese discussed in section 4.

The boundary between the two APs in (24) coincides with a syntactic boundary between two phrases (the subject *nire lagunen alabia* 'my friend's daughter' and the subordinate clause *umiari biberoya emóten* 'to bottle-feed the baby'), but speakers may also split long syntactic phrases containing three or more unaccented words in two APs. This can be observed in the F0 contour corresponding to sentence (25) (Fig. 9):

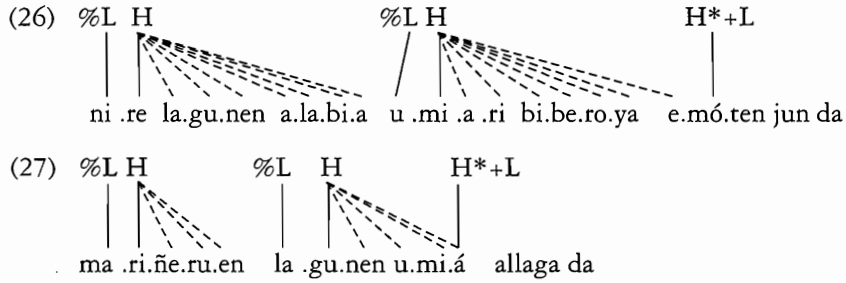
(25) mariñeruen lagunen umiá allaga da
fisherman-gen.sg. friend-gen.sg. child-abs.sg. arrive aux
'The fisherman's daughter's child has arrived'

A small drop in pitch level occurs after the last syllable of the first word, so that the first syllable of the word *lagunen* has a lower tone. The second syllable of this word, however, has a higher pitch than the first syllable, which means that there is a rise from L to H. The L tone is undershot, i.e., it is a highish L. This indicates that there is an AP boundary between the first word *mariñeruen* and the *lagunen.* That is, the same pattern as in (24) is observed, a boundary between two APs which is not triggered by a H*+L pitch accent. Unlike (24), however, this division occurs within a single syntactic phrase, the subject *mariñeruen lagunen umia* 'the fisherman's daughter's child'. The slower and more careful the speech, the bigger the likelihood of finding these type of divisions.

The reason why we are positing a process of tone spreading rather than phonetic interpolation is that the high tone region between the phrasal H and H*+L or the end of the unaccented AP has the shape of a plateau, and leveled tonal regions or plateaus are more characteristic of phonological spreading than phonetic interpolation. This is why 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 end of the AP. The F0 contour in this region slopes downward and does not show the level tone shape that would be predicted by tone

spreading, and Pierrehumbert and Beckman conclude that a phrasal H tone associated to the second mora in an accentual phrase must be responsible for the pattern observed. If interpolation were at stake in Lekeitio Basque there would be a sagging shape between the phrasal H and the H*+L pitch accent, which is not observed. Moreover, in cases in which there is no pitch accent, the next phonologically specified tone after the phrasal H would be the initial %L of the next AP, and thus a descending line would be expected to occur between those two tones. Again, a plateau is found instead of such a line, which indicates that there is phonological spreading from phrasal H to the end of the AP.

We could represent the phonological association of tones to the syllables in the utterances in (24)-(25) as in (26)-(27). We are not writing H tones associated to the syllables between the second syllable of the AP and the end of the AP because such those tones do not exist as part of the intonational structure of the AP; rather, they are the effect of phonological spreading from the phrasal H. This is symbolized by the discontinuous lines extending from the phrasal H in the phonological representations in (26)-(27). Syllable boundaries are indicated only for the words where tones are phonologically associated:



In consequence, then, the right edge of an AP need not be aligned with a H*+L pitch accent; it may be aligned with the right edge of a word with no pitch accent.[15] A H*+L accent automatically signals the right edge of an AP, as the next word always starts with a L tone and continues with a rise on the second syllable. When the right edge of an AP is not marked by a pitch accent, however, hearers know that an AP ends and a new one starts simply because from a H tone there is a drop to L and then a rise to H again. Thus, it is the intonational sequence H L H that marks the boundary between two APs. In the absence of H*+L accents that automatically force AP boundaries, in utterances with stretches without accents speakers may produce intonational groupings that reflect the organization of the utterance according to informational structure (e.g., boundaries between old and new information), specially at a slow speech rate. Speakers with a faster rate of speech do not create these boundaries within sequences of unaccented words and pronounce utterances like (24)-(25) with a single high tone plateau. This is illustrated in Fig. 10, which con-

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

tains the F0 contour of an utterance with the same words as in (24) but uttered with a single high tone plateau, without AP divisions among the unaccented words.

5.1.2. Conditions on the phonetic realization of %L and H

%L and phrasal H are subordinate to the realization of H*+L pitch accents. There are certain conditions that have to be met in order for the %L boundary tone and phrasal H to surface. These are dictated by the accentual properties of the initial word in the AP, where this tone is realized. If the first word in an AP is bisyllabic and accented, the H*+L pitch accent takes priority and the %L tone will not be realized (cf. (28a)). 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. (28b) below). 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:

(28) a. H*+L
|
mó . no

b. H*+L
|
útz ein dau
miss do aux
'(S)he has missed it'

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.

Similarly, a phrasal H will not be realized if an AP is composed only of two syllables and there is a pitch accent on any of the two syllables. If the first syllable has a pitch accent, the second syllable will receive a low tone (cf. (28a)), and if the second syllable receives a pitch accent, the first syllable presents a %L boundary tone and there is no room for the phrasal H to be realized. For instance:

(29) %L H*+L
| |
bal .tzá 'black'

The phrasal H will not be realized when an AP has three syllables and the second syllable has a pitch accent, either; the first syllable is linked to a %L, the second syllable to a H*,and the third syllable to the L tone of the H*+L pitch accent. For instance, in a trisyllabic accented word:

(30) %L H*+L
\ |
mu.tí .llak 'the boys (abs./erg.)'

A phrasal H will be phonetically realized when the AP is three syllables long but lexically unaccented (i.e., without an accent on the second syllable), as in (31). In APs with four or more syllables there is enough room for the phrasal H to be realized, whether there is a lexical H*+L pitch accent or not, i.e., whether there is a pitch accent on the penultimate syllable or on the final syllable (cf. (32)):

(31) %L H H*+L
\ | |
ka.le .rá 'to the street'

(32) a. %L H H*+L
\ | |
bu .ru .án .di 'stubborn'

b. %L H H*+L
\ |
txi .mis.ti.ák 'the lightning (erg.)'

Summarizing, we can say that the realization of H*+L (be it lexical or derived) takes priority over the phonetic realization of %L and phrasal H. A %L boundary tone will not be phonetically realized on the first syllable in an accentual phrase if this syllable has been assigned a pitch accent at the word level or at the phrasal level. A phrasal H tone will be realized on the second syllable of an AP only if this is at least four syllables long, or three syllables long and unaccented.

To conclude this section, we claim that this intonational analysis of the occurrence of tones in syllables which are not accented signifies an improvement over Hualde's analysis with two cycles of tone assignment with two directions of tone spreading: one in which the first syllable is extratonal and a process of H tone leftward spreading takes place, and another in which the tone assigned to the last syllable of the preceding word is spread rightward onto the initial syllable of the following word, which has lost its extratonality (cf. § 3.2-3.3).

5.1.3. Main prominence and the verb phrase

As described above, the pitch accent occurring right before the verb is the most prominent accent in the utterance, an effect that is caused by the fact that the region of the utterance following this accent appears with a lower pitch level, starting with the verb. The L tone appearing on the initial syllable of the verb indicates that the sequence formed by the verb and the material that follows forms an AP on its own. That is to say, the L tone on the initial syllable of the verb is analyzed as an initial %L boundary tone of an AP. As we can see in Figures 7-10, 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 APs following the most prominent accent in

the sentence.[16] When more material follows the verb, it appears at the same depressed pitch range. See, for example, the contour in Figure 11 for the sentence in (33):[17]

(33) %L H H*+L %L H L%

e.wel.di o.ná e.mon dau mariñeruak

weather good give aux. fisherman-erg.

'The fisherman has predicted good weather'

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 12 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 it 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 downstep, triggered by the preceding H*+L pitch accents (cf. next section):

(34) %L H H*+L %L H H*+L %L H H*+L

e.wel.di o.ná e.mon dá.be ma.ri.ñe.rú.ak

weather good give aux. fishermen-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).

5.1.4. Lack of isomorphism between syntax and prosody

An interesting observation is that APs 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 APs, depending on the number of lexical pitch accents occurring in the phrase. A clear example is provided in (35), where four APs are distinguished within the same NP. In Figure 13 we can see the four %L tones beginning each AP:

(16) This conclusion is stated in Jun and Elordieta (1997), contra Elordieta (1997), who claims a leftward spreading of H*, along the lines of Hualde (1991a).

(17) 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).

(18) At the end of the utterance there is a L% boundary tone, which will be discussed in section 5.3.

(35) %L H*+L %L H*+L %L H*+L %L H*+L

A.má.yen la. gú. nen u.mí . en o .yá

Amaya-gen. friends-gen.pl. child-gen.pl. bed-abs.

'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 (36) almost as a minimal pair with (35), the difference being that in (36) no accented roots or accented suffixes occur (the genitive suffixes in (36) are singular, opposed to the plural genitives of (35)). We illustrate the F0 contour for this sentence in Figure 14:

(36) %L H H*+L

ni. re a.men la.gu.nen u.mi.en o.yá

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 AP may span more than one syntactic phrase. In sentences such as the ones in (37) and (38) 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 AP, 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. Figure 15, corresponding to (38)):

(37) %L H H*+L %L H L%

[$_{NP}$ ni.re a . ma] [$_{PP}$ I . ru . ña . rá] [$_{VP}$ a.llaga da]

my mother Iruña-all arrive aux

'My mother has arrived to Iruña'

(38) %L H H*+L %L H H*+L

[$_{NP}$ u.mi.a.ri] [$_{AdvP}$ nor.ma.li. an] [$_{NP}$ u . rá] [$_{VP}$ e.mo.ten do.tzá.gu]

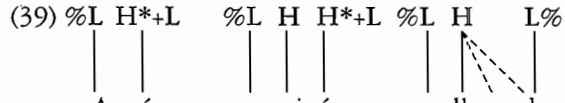
child-dat. normally water give aux.

'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.

5.1.5. Downstep

The contour shown in Figure 13 is indicative of downstep or catathesis having applied. The four peaks descend progressively in tonal value, in a stairway fashion. This progressive descent suggests that downstep 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 downstep do not have to be lexical pitch accents. Downstep affects phrasal pitch accents as well. Observe for example Figure 16, which represents the contour of the utterance in (39), with a lexical pitch accent being followed by a phrasal pitch accent:



An interesting aspect to consider is the domain of downstep in Lekeitio Basque, that is, whether downstep 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 APs 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. There is then a phrasal H tone phonologically associated to the second syllable of the AP, responsible for the rise in pitch observed after the first syllable. It is phonetically realized on the second or third syllables of an AP (the longer the AP, the bigger the tendency to be realized at the end of the second syllable, or on the third syllable), but if a H*+L falls on the second syllable of an AP, it prevents the phrasal H from being realized. Finally, the end of an AP may or may not be marked by a H*+L pitch accent (lexical or phrasal/derived); if there is a H*+L pitch accent, it automatically marks the right end of an AP, but in a sequence of unaccented words a speaker may choose to end an AP without a pitch accent. This was taken as evidence in favor of positing a phrasal H and a phonological process of high tone spreading which accounts for the high tone plateau regions covering the tonally underspecified syllables (cf. § 5.1.1).

5.2. The intermediate phrase

In Lekeitio Basque we could identify a prosodic constituent immediately dominating APs: the intermediate phrase (iP). The major indicator of an iP break is the blocking of downstep, as in Japanese. In the sentence illustrated in (40), for instance, there are three APs, represented by the words *amáyen*, *amumári* and *liburúa*, each of them carrying a lexical pitch accent:

(40) %L H*+L %L H H*+L %L H H*+L %L 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 17 it can be observed that the second pitch accent, corresponding to the accented syllable in *amumári*, is downstepped with respect to the first pitch accent, but the third pitch accent is not downstepped with respect to the second pitch accent. Contrast this contour with the one in Figure 13, where downstep has applied across all four accentual phrases. One could argue that the difference lies in the fact that the APs in (35) form part of the same syntactic constituent, i.e., an NP, and that those in (40) are divided in two syntactic phrases, i.e., two NPs. The first two accentual phrases are form part of the dative NP, and the third accentual phrase forms part of the direct object NP. Thus, the idea would be that downstep does not chain across two syntactic maximal projections. This hypothesis, however, encounters the problem posed by the fact that downstep applies between two accentual phrases belonging to different syntactic phrases. In (41) below there are two APs, as shown by the two peaks in the intonational contour of the utterance (cf. Figure 18), and each of them corresponds to a different syntactic maximal category:

(41) %L H H*+L %L H H*+L %L H L%

[NP A.ma.yá.ri] [NP li.bu.rú.a] [VP emon dotzo]

Amaya-dat book-abs give aux

'(S)he has given the book to Amaya'

As Figure 18 shows, downstep applies to the second pitch accent in the presence of a preceding H*+L pitch accent, even though the two APs are in two separate syntactic maximal projections.

When we consider three maximal projections preceding the verb, each of them containing one AP, however, an interesting pattern obtains. Downstep 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 (42), and its intonational contour illustrated in Figure 19:

(42) %L H*+L %L H H*+L %L H H*+L %L H*+L L%

[NP A.má .ya] [PP on.go e.we.ní . an] [NP on.da.rre.rá] [VP jungó da]

Amaya this-of Thursday-ines beach-all go-fut aux

'Amaya will go to the beach this Thursday'

The intonational contour in Figure 19 looks very similar to the one in Figure 17, 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 iP, and second, we assume that an iP boundary blocks downstep, as in

Japanese (cf. § 4.2). That is, a syntactic phrase is a barrier for downstep. This is why downstep does not apply between the second and third APs in Figures 17 and 19. Now, to account for the occurrence of downstep between the two APs in Figure 18 and the first two APs in Figure 19, we must assume that an iP composed of a single AP cannot be left stranded on the left edge of the utterance and is reanalyzed as part of the following iP. Notice in this regard that there is a contraint in the directionality of reanalysis; an iP containing only one AP may remain on the right edge of the utterance without having to incorporate into the previous iP. The rightmost iPs in (40) and (42) (Figs. 17, 19) do not have their single pitch accent downstepped with respect to the previous accent.

The paradigm is completed with an example in which there are three APs, the first one contained in a maximal projection and the other two contained in another maximal projection (cf. (43) below). As is expected from our analysis, downstep applies in a chain formation (cf. Figure 20). The first iP, being composed of a single AP, is incorporated into the following iP, and thus the first pitch accent triggers downstep onto the second pitch accent. The second pitch accent, in turn, triggers downstep on the following pitch accent, since they are contained in the same iP.

(43) %L H H*+L %L H*+L %L H H*+L %L H L%

[$_{NP}$ a.mu.má . ri] [$_{NP}$ a.má.yen li.bu.rú. a] [$_{VP}$ emon dotzat]

grandmother-dat Amaya-gen book-abs give aux

'I have given Amaya's book to the grandmother'

5.3. The intonation phrase

The intonation phrase (IP) is the largest intonational unit in Lekeitio Basque, comprising iPs and APs within them. This domain is marked by %L, L%, %H and H% boundary tones occurring at its beginning and end. The right edge of an IP may or may not be followed by pause, but a cue of an IP's right edge is phrase-final lengthening; final vowels of IPs are considerably longer than final vowels of APs and iPs (cf. Jun and Elordieta 1997: 196). The initial %L boundary tone is found in declarative sentences, and is associated to the initial syllable in the utterance, provided it does not bear a pitch accent. This tone will coincide with the initial %L tone of the first AP in the utterance. Declaratives have final lowering, which indicates there is a final L% boundary tone at the end of declaratives.

I will show in section 7 that absolute interrogative sentences have higher overall pitch ranges than declaratives, which seems to indicate that an initial %H tone is a property of that type of interrogative sentences. Wh-questions, however, do not have a higher pitch range. 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. § 7.2.1 and 7.2.2). IPs in list-type enunciations show final H% (cf. § 7.3).

Parenthetical phrases have IP boundaries to their left and right, i.e., they constitute independent IPs from the surrounding phrases (cf. (44)). Topic phrases and

adverbial clauses separated from the rest of the utterance by a pause or strong juncture will have an IP boundary at their right edge, followed by the beginning of another IP, corresponding to the next portion in the utterance (cf. (45); these utterances are discussed in § 7.4):

(44) $_{IP}$[Míren nire laguna], $_{IP}$[lein bankúan étxen ebana biarra], $_{IP}$[datorren astián eskontzén da]
Miren my friend before bank-ines. do-imperf. aux-that work, next work get.married-perf aux
'My friend Miren, who used to work at the bank, is getting married next week'

(45) $_{IP}$[dirua emón nabenian], $_{IP}$[Amayenéra ein dogu]
money-A give aux-when Amaya-G-to do aux
'When (s)he has given me the money, we have gone to Amaya's'

The level of the utterance (U) is posited by Pierrehumbert and Beckman (1988) as the highest level of intonational constituency, comprising one or more IPs, but we have not found clear cues that indicate that the utterance exists as an intonational constituent in Lekeitio Basque. Further research will shed some light on this open issue.

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 (AP)*:
   — an initial %L boundary tone is associated to the first syllable in the phrase, provided it has not been assigned a pitch accent;
   — a phrasal H tone is associated to the second syllable of an AP, and is phonetically realized on the second or third syllable, depending on the length of the AP. This H tone is then interpolated up to a syllable with a H*+L pitch accent or the start of another AP.
   — H*+L pitch accent marks the right edge of an AP. But an AP need not have a H*+L accent, as some speakers may break up sequences of unaccented words in several APs, specially at slower speech rates, possibly reflecting semantic grouping.

2) *Intermediate Phrase (iP)*:
   — comprises one or more APs;
   — every syntactic maximal projection marks the boundary of an iP. A syntactic maximal projection occurring on the left edge of an utterance and containing a single AP cannot constitute an independent iP, and is included as an AP within the following iP;
   — the iP is the domain of downstep;

3) *Intonation Phrase (IP)*:
   — 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. § 7).

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 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 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 an acute accent mark above the relevant syllable nucleus; the focalized element is shown in capital letters in the English translation:

(46) [zure herriko andra zarrá] ikusi dot
your town-of woman old see aux.
'I have seen THE OLD WOMAN FORM YOUR TOWN' / 'I have seen THE OLD WOMAN from your town' / 'I have seen the OLD woman from your town', etc.

(47) a. *[zure herriko andrá zarra] ikusi dot
b. *[zure herrikó andra zarra] ikusi dot
c. *[zuré herriko andra zarra] 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., *zure herriko 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 sentence 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 AP. The first two situations are exemplified in (48)-(49):

(48) diruá
money
'THE MONEY'

(49) diruá emon nau
money give aux
'(S)he has given me the money'

The third situation, namely that in which a word constitutes an AP on its own, deserves some discussion. In a sentence such as (50), if the first word is the semantic focus, for instance as a response to a question such as *'Whose money did she give me?'*, it will receive focal accent, i.e., it will contain the most prominent accent (cf. Fig. 21). 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.

(50) %L H*+L %L H H*+L

a.má. yen di.ru. á emon nau
Amaya-gen money-abs give aux
'(S)he has given me Amaya's money'

Within a syntactic phrase such as (50), the second word may also be perceived as the most prominent accent in the utterance prosodically, but only through a special kind of focalization. In a neutral pronunciation the first word is usually perceived as the most prominent one prosodically, whether it is the pragmatic focus or whether the second word is the pragmatic focus. Thus, (50) could be uttered as a response to any of the following questions: *'What has she given me?'*, and *'Amaya's what did she give me?'*. The F0 contour would be the same in all cases, namely that of Fig. 21. However, the last word could receive main prosodic prominence if it is what we call 'focus of correction'. This term refers to the case in which a word or phrase may be set in contrast or opposition to a word or phrase which has been uttered in a previous turn of speech. Thus, we can imagine a situation in which someone states that (s)he has given me Amaya's book. Knowing that this statement is incorrect, another speaker replies with a sentence such as (51), where the word in capital letters and boldface is the element that is focalized as a matter of correction (Fig. 22):

(51) Amáyen DIRUÁ emon nau
'(S)he has given me Amaya's MONEY'

Obviously, the first word may also get focalized this way, for instance if an interlocutor says in a conversation that someone gave Jon's money to the hearer, the hearer (now the speaker) replies with (52) (Fig. 23):

(52) AMÁYEN diruá emon nau
'(S)he has given me AMAYA'S money'

In any case, we are showing that there is a difference between being an unaccented word within a syntactic phrase preceding the verb and an accented word. Accented words may be the most prominent words prosodically, whereas only unaccented words which are immediately preverbal may be the most prominent words in the utterance.

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.e., the schematic syntactic structure of the sentence would be [$_{NP}$ amáyen diruà] [$_{VP}$ emon nau]). A word not contained in the phrase adjacent to the verb cannot be focalized, irrespective of whether it is accented or not:

(53) *[$_{NP}$ LAGUNÁK] [$_{NP}$ amáyen diruà] [$_{VP}$ emon nau]
'THE FRIEND has given me Amaya's money'

(54) *[$_{NP}$ LAGÚNAK] [$_{NP}$ amáyen diruà] [$_{VP}$ emon nábe]
'THE FRIENDS have given me Amaya's money'

The same would hold true in sentences with two accented words. That is, whatever applied for (50)-(52) would apply for (55); both words would be able to stand out as the most prominent ones prosodically:

(55) %L H*+L %L H H*+L
A.má.yen li.bu rú.a emon nau
Amaya-gen book-abs give aux
'(S)he has given me Amaya's book' (cf. Fig. 24)

(56) A.má.yen LIBURÚA emon nau
'(S)he has given me Amaya's BOOK' (cf. Fig. 25)

(57) AMÁYEN liburúa emon nau
'(S)he has given me AMAYA'S book' (cf. Fig. 26)

From the occurrence of these patterns we conclude that if a word does not constitute an accentual phrase by itself, it cannot be independently focalized. This contrasts with the Japanese dialect of Tokyo studied by Pierrehumbert and Beckman (1988), in which all words, unaccented and accented, can be made prosodically prominent.

Another observation we can make out of the prosodic focalization patterns seen above is that focalization creates an intermediate phrase boundary. By virtue of this boundary, the second words in (51) and (56) do not undergo the phenomenon of downstep that we observe in their nonfocalized versions. Thus, compare Figs. 21 and 22, and Figs. 24 and 25.

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, yes/no and wh-echo questions, list-type utterances, continuative intonation, exclamatives, and exhortatives.

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 final L% boundary tone is reached. The fact that lexical pitch accents do surface in the intonational contour 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 12, 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 or 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 F0 contour shown in Figure 27, for the sentence in (58):

(58) %L H H*+L L%

Ma.ri.bí allaga da he.rri.ra?
Maribi arrive aux. town-all.
'Is Maribi the one who has arrived in town?'

Compare the F0 contour in Figure 27 to the one in Figure 28, which corresponds to the declarative sentence (59):

(59) %L H H*+L L%

Ma.ri.bí allaga da he.rri.ra
'Maribi has arrived in town'

The absolute peak value for the pitch accent in Figure 27 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 28 is substantially lower, at 160.8 Hz, and the tonal region located after 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 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. There would then be two different initial boundary tones belonging to different intonational constituents: %H of the utterance and %L of the AP.

Final lengthening is another characteristic of interrogative sentences. Note that the final syllable of *errira* is considerably longer in the interrogative sentence (58) than in the declarative sentence (59). This is shown in Figures 27 and 28, 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 (60) below, where we indicate the prosodic unit by hyphenation (see Figure 29):

(60) H*+L

oyan - da.gó
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 (60) with (61), whose F0 contour is represented in Figure 30:

(61) %H %L H*+L L%

o . yán da.go?
'Is (s)he in bed?'

Before we finish this issue, it has to 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 31):

(62) %H %L H H*+L H%

a.lla.gá ra Maribi erri.ra?
arrive aux. Maribi town-all.
'Has Maribi arrived in town?'

7.2.2. Wh-questions

Unlike absolute interrogatives, wh-questions do not have a higher pitch range than declaratives, and do not have longer final syllables. 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 F0 contour in Figure 32 for the sentence in (63):

(63) %L H*+L L%

no.ré.na da ori u.mi.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 (64) with its wh-counterpart in (65):

(64) umiá erun dogu mendira
child take aux. mountain-all.
'We have taken the child to the mountain'

(65) H*+L

nór erun dó.gu men.di.ra?
who take aux. mountain-all.
'Who have we taken to the mountain?'

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 (65) could thus have an alternative counterpart in (66) (cf. Figure 33):

(66) %L H*+L H*+L H%

nór erun dó.gu mendi.ra?
who take aux. mountain-all.

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 (67) and (68) we provide examples of yes/no questions, whose F0 contours are represented in Figures 34 and 35:

(67) %H %L H*+L L%

u.mi.á erun dau men.di.ra?
child-abs take aux mountain-all
'(Are you saying that) (s)he has taken the child to the mountain?'

(68) %H %L H H*+L L%

li.bu .rú.a erun dau men.di.ra?
book take aux mountain-all
'(Are you saying that) (s)he has taken the book to the mountain?'

As we can see in Figures 34 and 35, the pitch drop which would correspond to the pitch accents in declarative or non-echo interrogative sentences is reduced in yes/no questions. In other words, there is no deaccenting of the portion of the utterance which follows the preverbal element (cf. the discussion of sentences (33)-(34) in section 5.2). This feature is more salient in yes/no echo questions formed by unaccented words (cf. (67), Figure 34). 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 F0 contour shown in Figure 35. 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

F0 contours in Figures 34 and 35 with those of their declarative and non-echo counterparts, represented in (69) and (70) (cf. Figures 36-39):

(69) a. H*+L

u.mi.á erun dau mendira
'(S)he has taken the child to the mountain'

b. H*+L

li.bu.rú .a erun dau mendira
'(S)he has taken the book to the mountain'

(70) a. H*+L

u.mi. á erun dau mendira?
'Has (s)he taken the child to the mountain?'

b. H*+L

li.bu.rú .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 (67), 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 (68) 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 (69a,b) we recorded frequency rates of 115-122 Hz and 109-115 Hz, respectively, the lowest points being 112.8Hz and 109 Hz, at the end of the utterances. In the interrogative sentences in (70a,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 alterna-

tive only among younger speakers. In wh-echo questions, however, only final raising is possible. See the examples in (71)-(72), and their respective F0 contours in Figures 40 and 41:

(71) %H H*+L H%

nór erun dau mendi.ra?
who take aux mountain-all
'Who (did you say that) (s)he took to the mountain?'

(72) %H H*+L H%

no.ré . na ra u.mi.a?
who-gen AUX child
'Whose (did you say that) the child is?'

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 Pierrehumbert and Beckman (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 nuclear 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 will limit ourselves to suggesting these plausible alternatives.

7.3. List-type utterances

In utterances where a series of words are listed, at the end of each word or syntactic phrase there is a H% boundary tone, both at the end of unaccented words (cf. (73), Fig. 42) and accented words (cf. (74), Fig. 43):

(73) %L H H% %L H H% %L H H*+L L%

a.la.bi.a , ne.bi.a , ta la.gu.ná.
daughter-abs. brother-abs., and friend-abs.
'The daughter, the brother, and the friend'

(74) %L H*+L H% H*+L H% %L H H*+L L%

a.mú.ma , Mí.ren , da Amáya
grandma-abs. Miren-abs. and Amaya-abs
'Grandma, Miren, and Amaya'

7.4. Continuative intonation

In most languages continuatives or unfinished utterances are characterized by a final rising intonation (Hirst and Di Cristo 1998). In Lekeitio Basque, however, this is not observed, as evidenced by adverbial clauses and topic phrases separated from the rest of the utterance by a pause or strong juncture. When the word before the juncture is unaccented, the pitch level of the word is maintained, without a rise or a fall, and the portion of the utterance that follows the break starts with a higher pitch level (cf. Figure 44, for sentence (75)). When the adverbial clause or topic phrase before the break ends in an accented word, the pitch level usually does not fall to the same level as at the end of the utterance, although it may do so as well. This signals that the first part is not a full utterance by itself (cf. Figure 45, for sentence (76)).

(75) dirua emon nabenian, Amayenéra ein dogu
money-abs give AUX-when Amaya-gen-to do AUX
'When (s)he has given me the money, we have gone to Amaya's'

(76) umien baberúa, iñorí be ez jako akordáten nun
child-gen bib-abs, nobody-dat NEG. AUX remember-prog. where
ipiñi genduan
put AUX
'The child's bib, nobody remembers where we put it'

7.5. Exclamatives

Exclamative sentences are characterized by starting with a high tone on the exclamative particle, *haixá*, followed by a sharp drop in pitch for the rest of the utterance. Observe Figure 46, for (77):

(77) haixá umore ona daukona horrek!
what-a mood good-abs.sg. has-that that-erg.sg.
'What a good mood that (person) is in!'

7.6. Exhortatives

In exhortative utterances, there in an initial peak corresponding to the accented syllable of the verb that starts the sentence, followed by a sharp fall in pitch. The rest of the utterance remains in a very low pitch level, as illustrated in Figure 47, for the utterance in (78):

(78) émon ura umiari!
give water child-dat.sg.
'Give water to the child!'

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 rightward spreading of a phrasal H associated to the second syllable of the accentual phrase. An accentual phrase may or may not have a H*+L pitch accent, if formed by unaccented words which are not in immediate preverbal position.

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 downstep may apply, but not across them. We 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 intonation phrase is the level where %L, L% and %H, 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 downstep 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.

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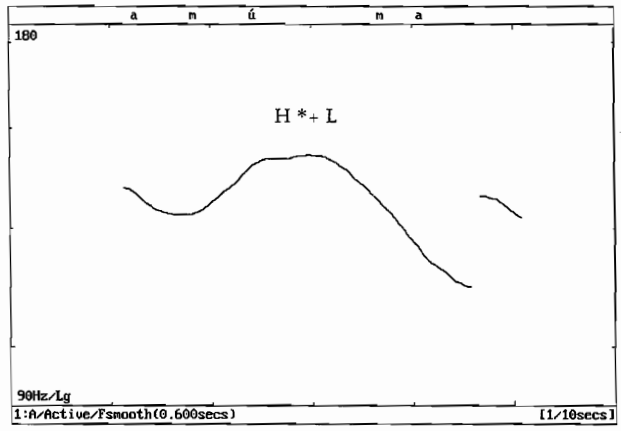
Fig. 1



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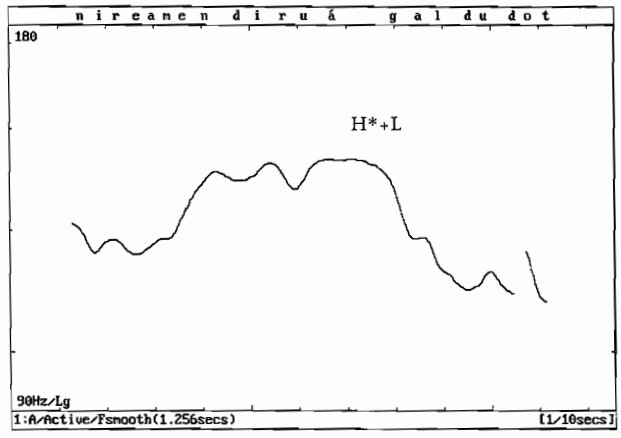

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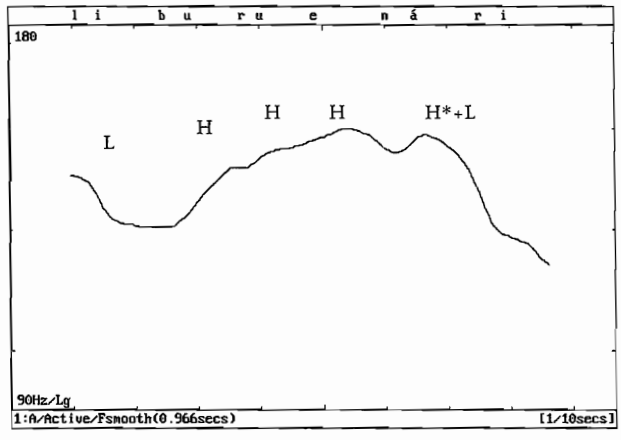

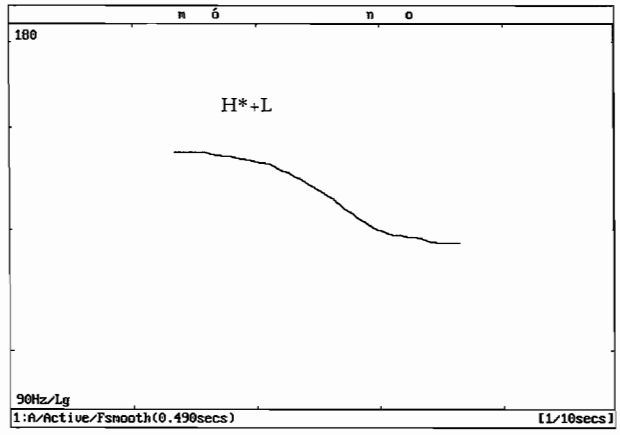

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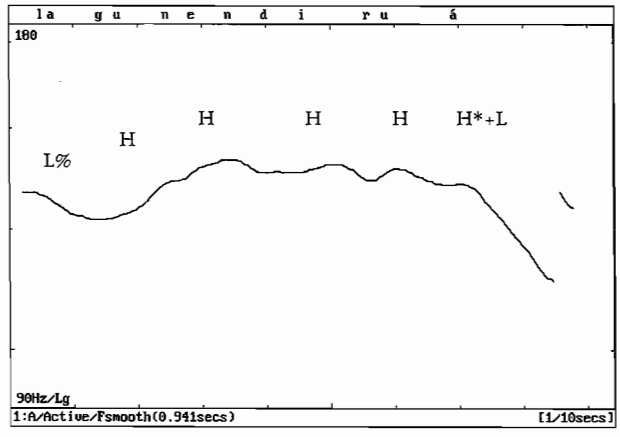

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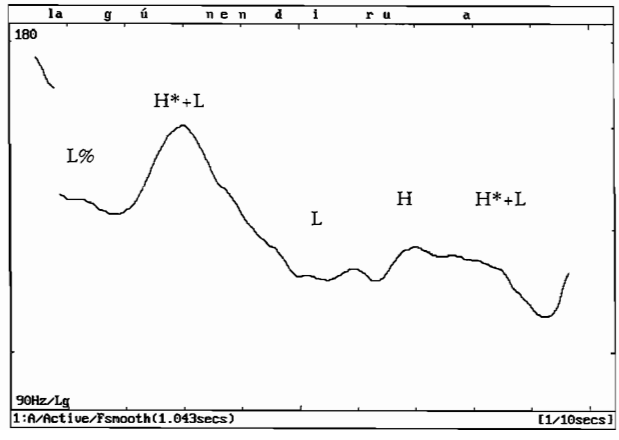

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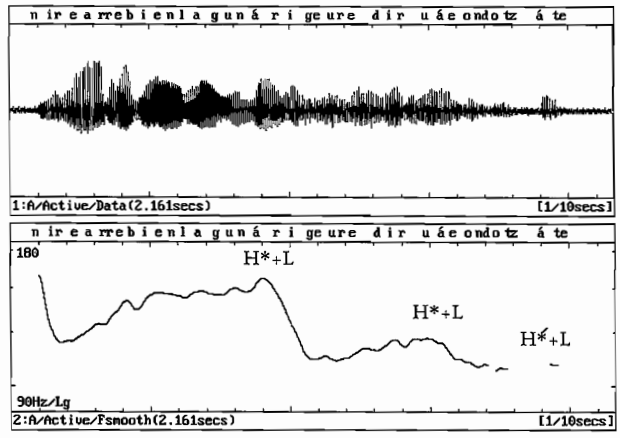

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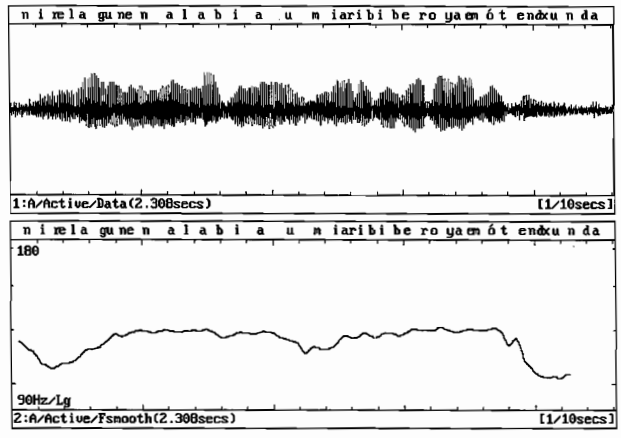

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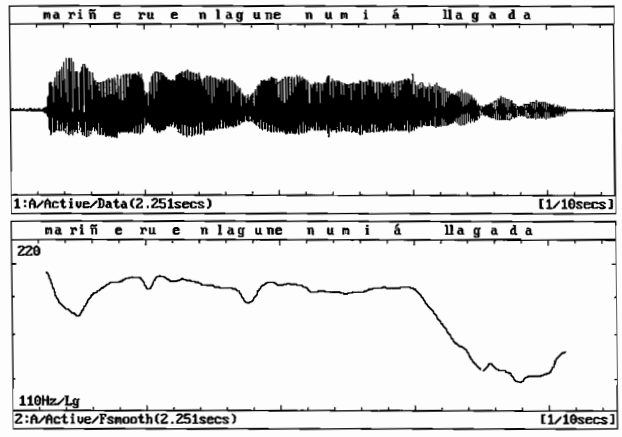

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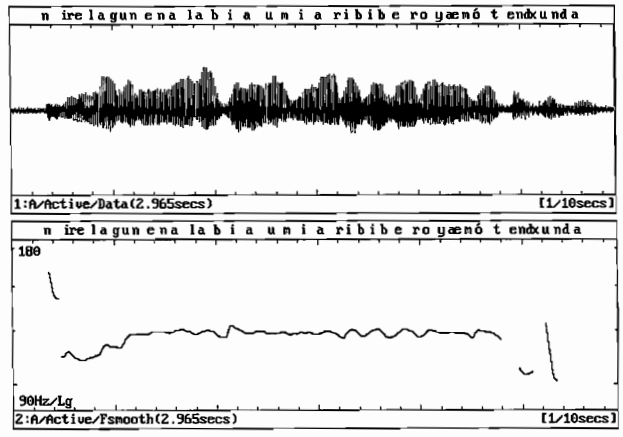

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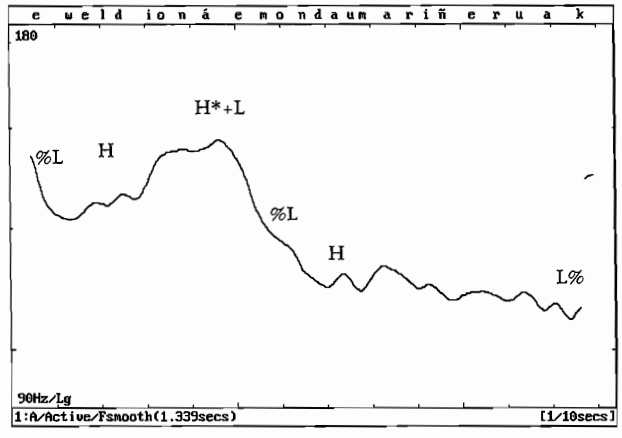

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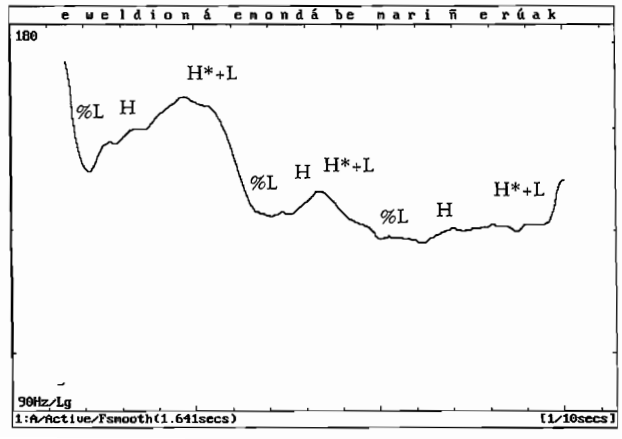

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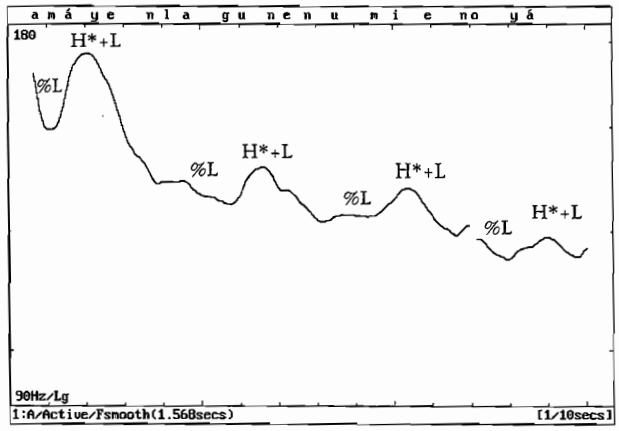

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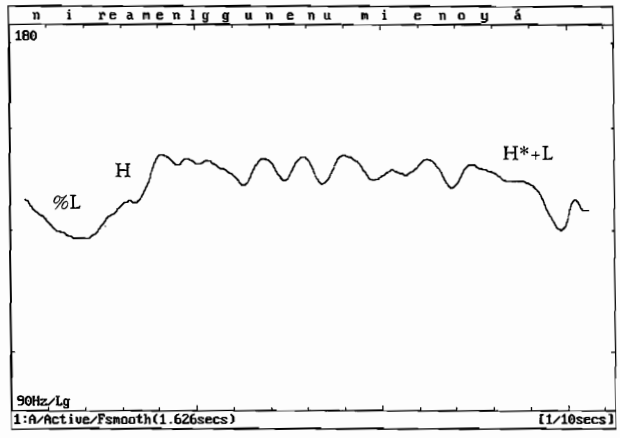

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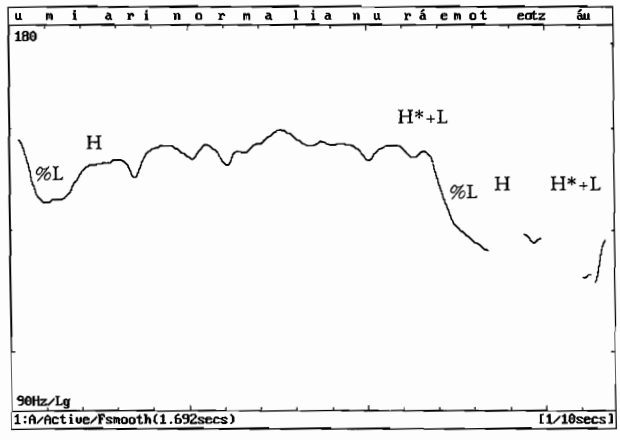

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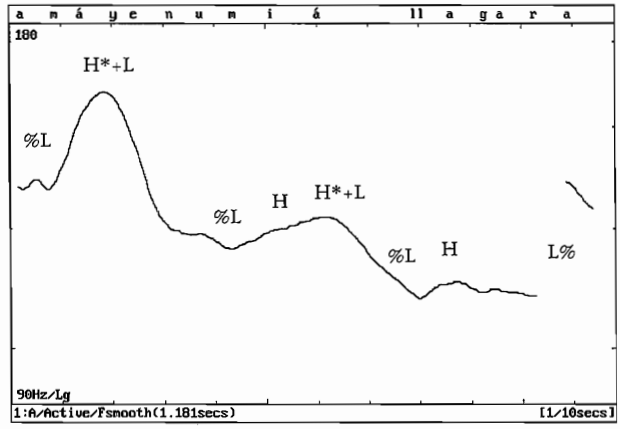

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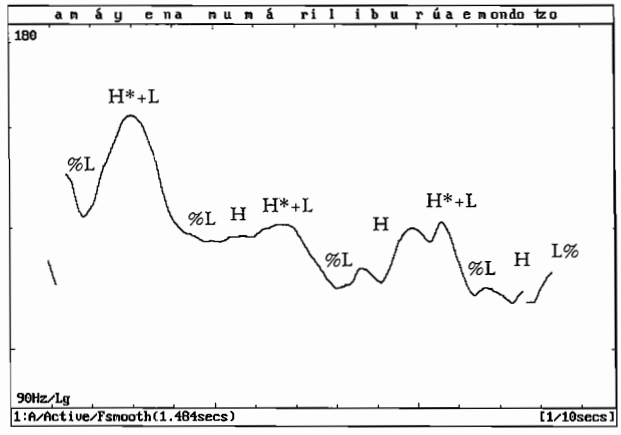

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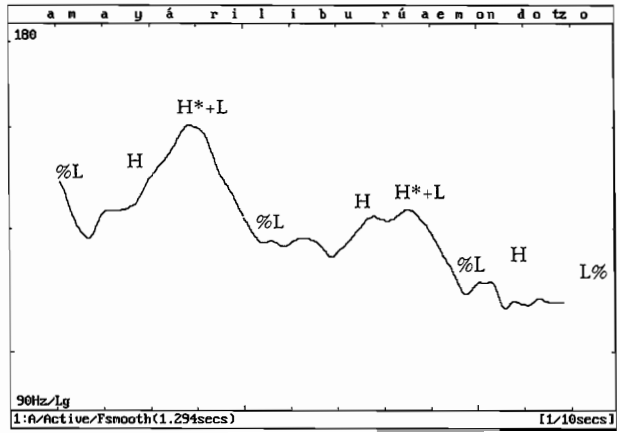
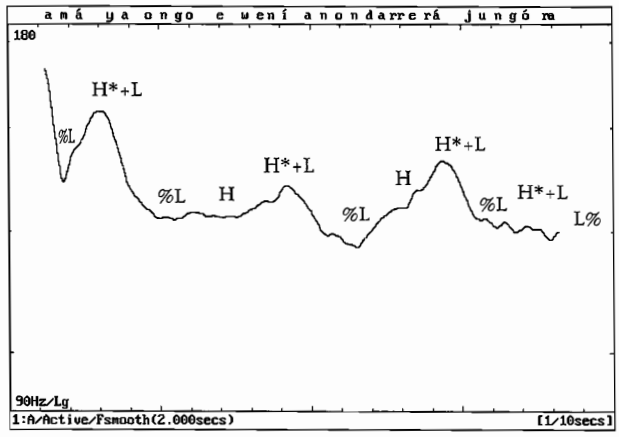


Fig. 18

Fig. 19



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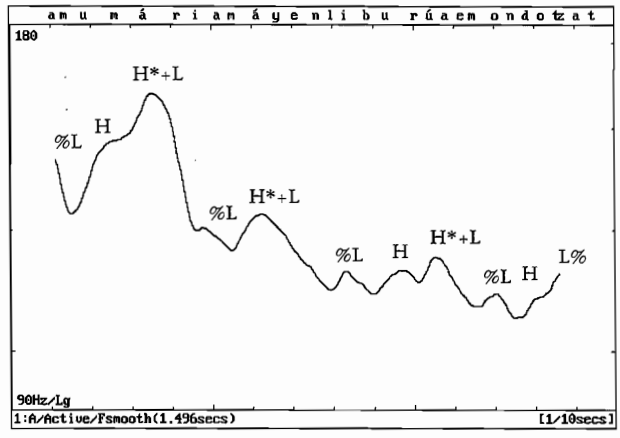

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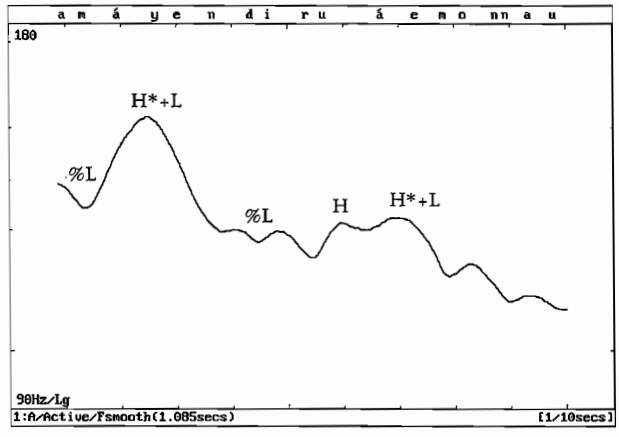

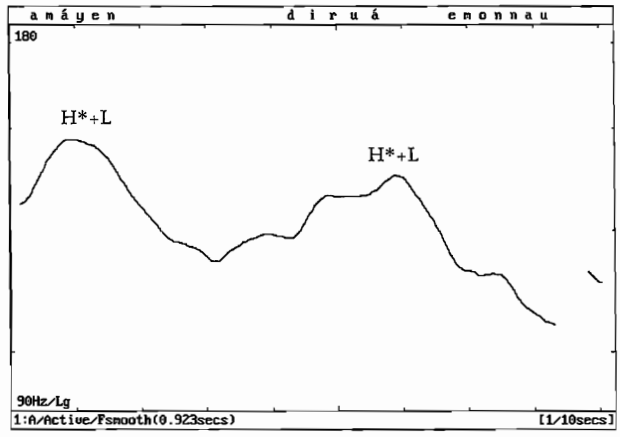

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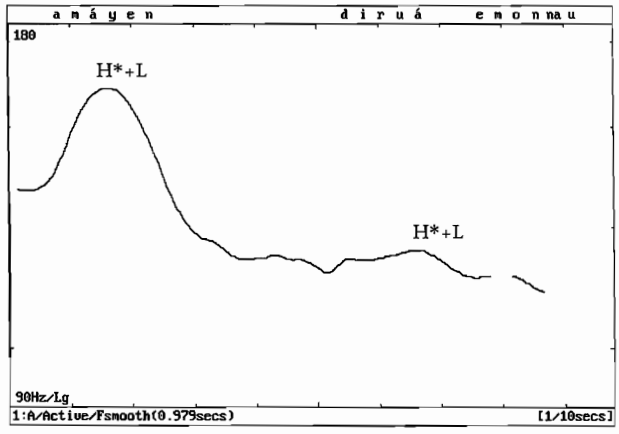

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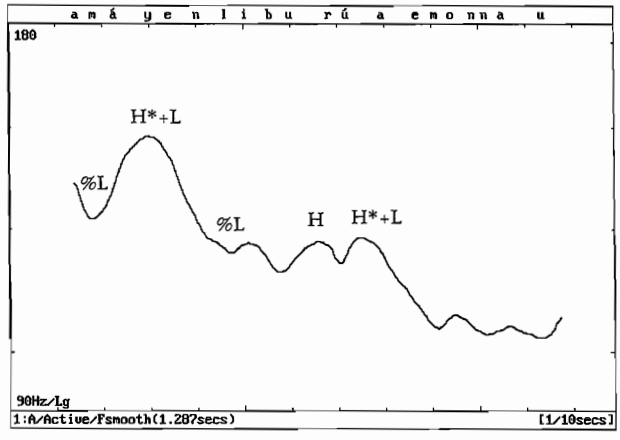
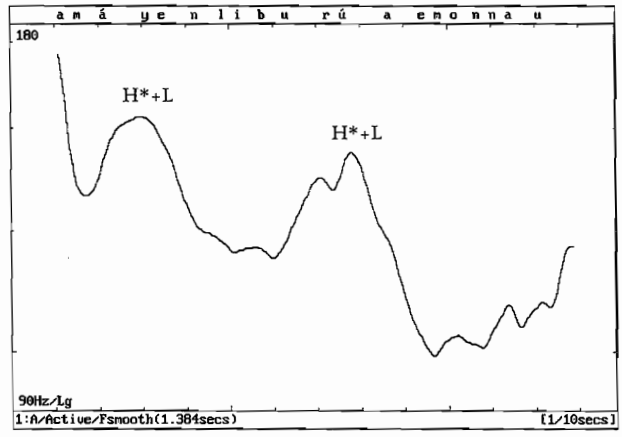


Fig. 24

Fig. 25



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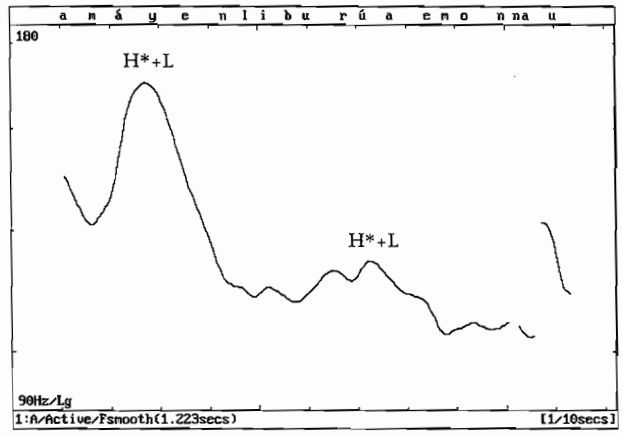

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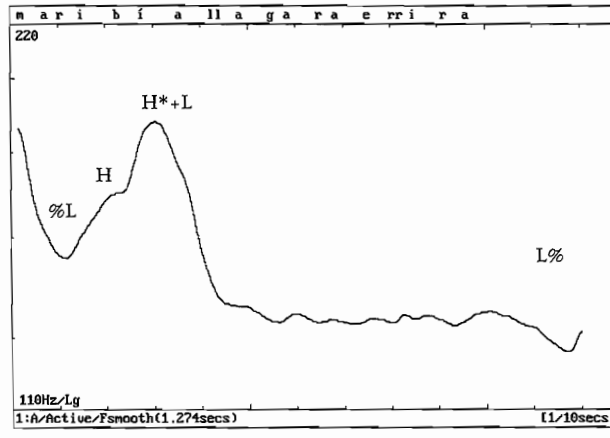

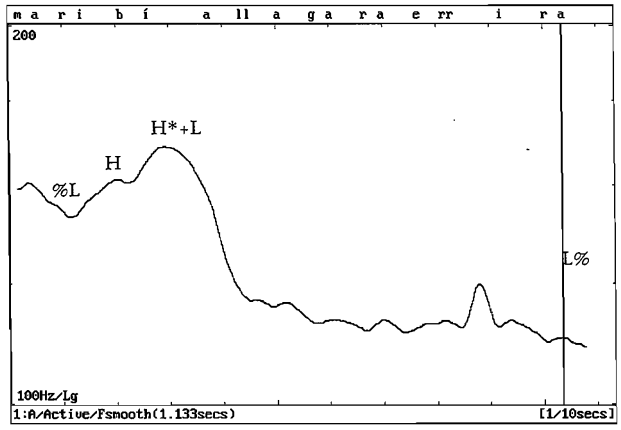

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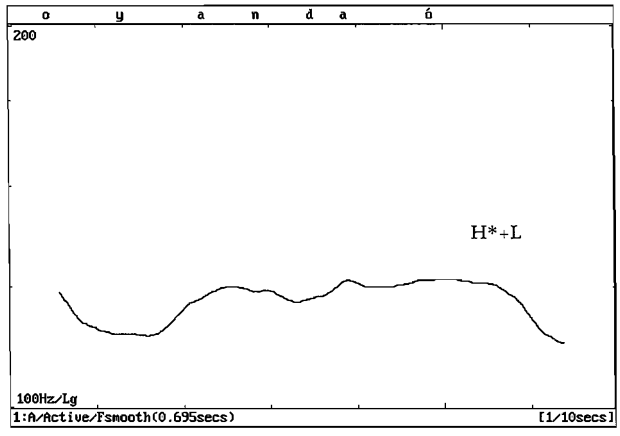

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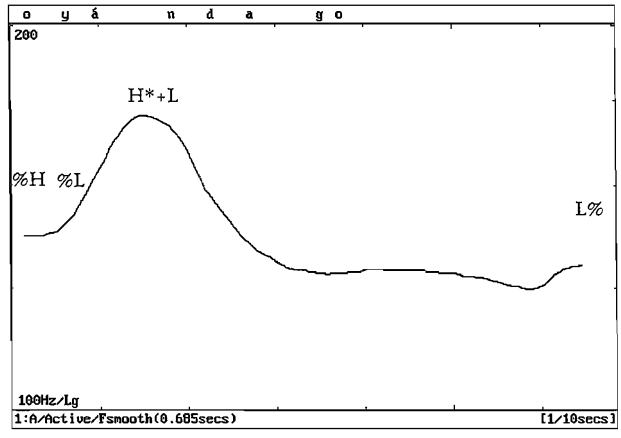
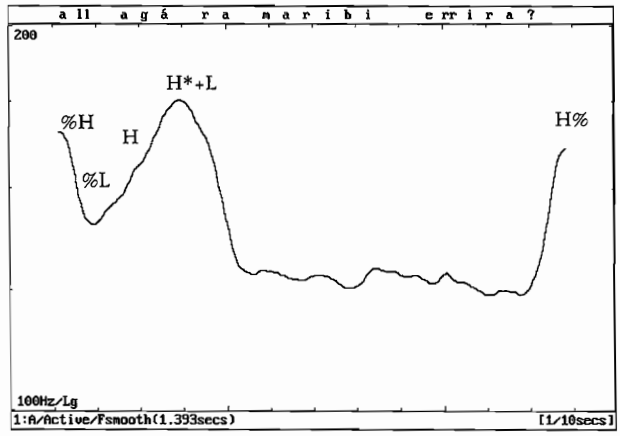


Fig. 30

Fig. 31



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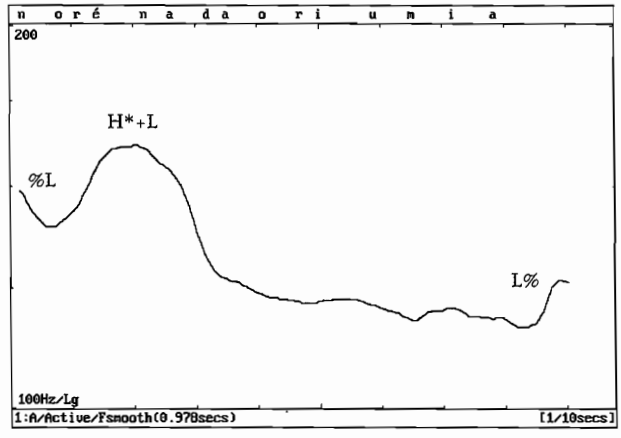

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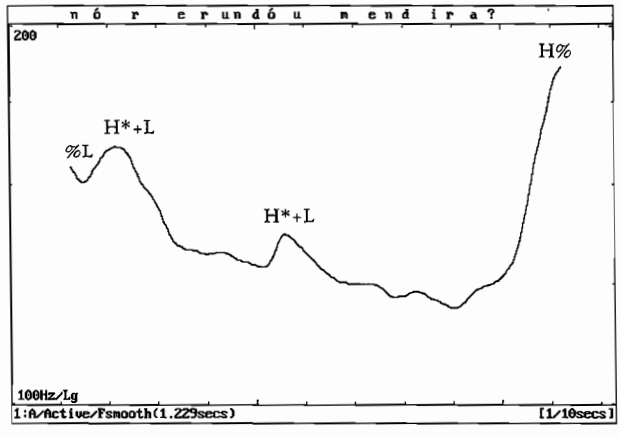

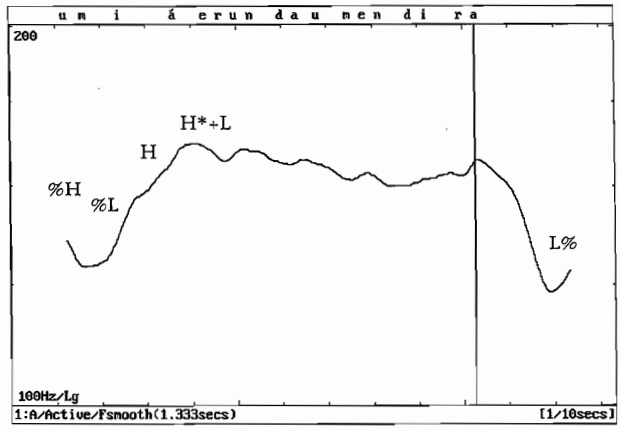

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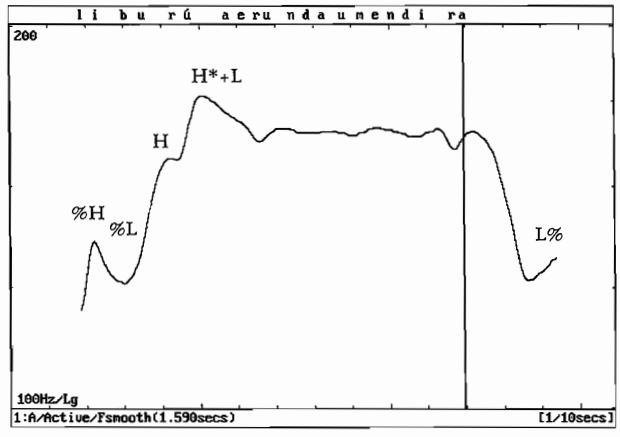

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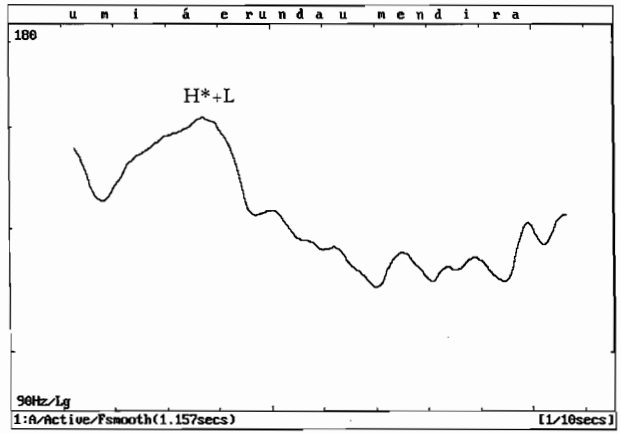

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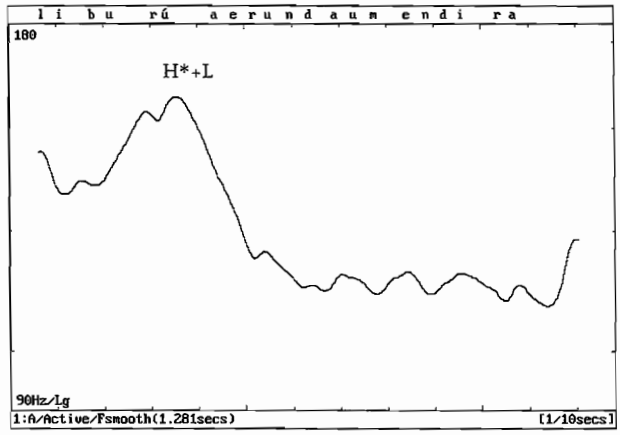

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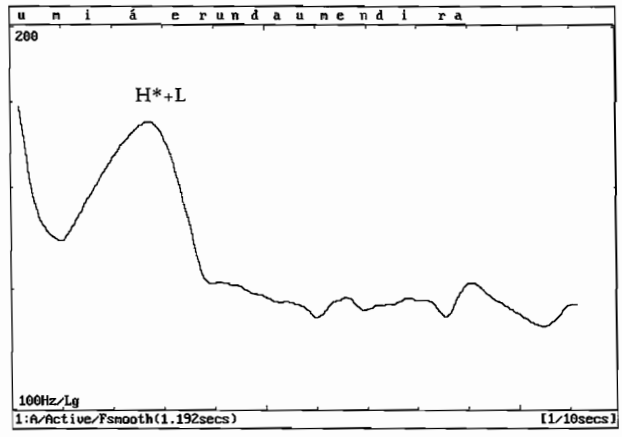

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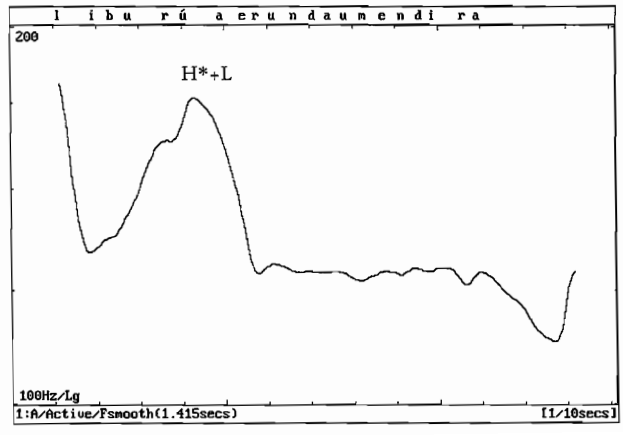
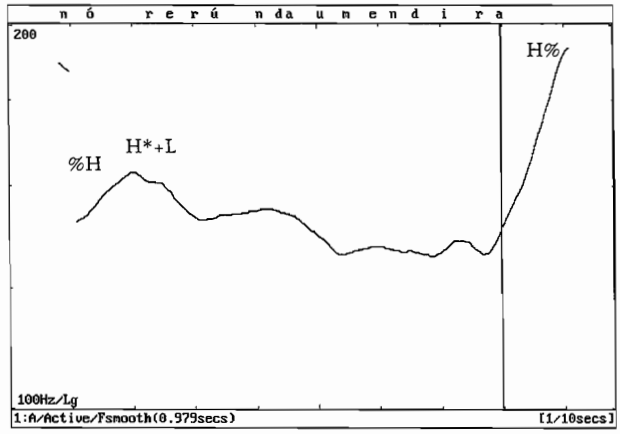


Fig. 39

Fig. 40



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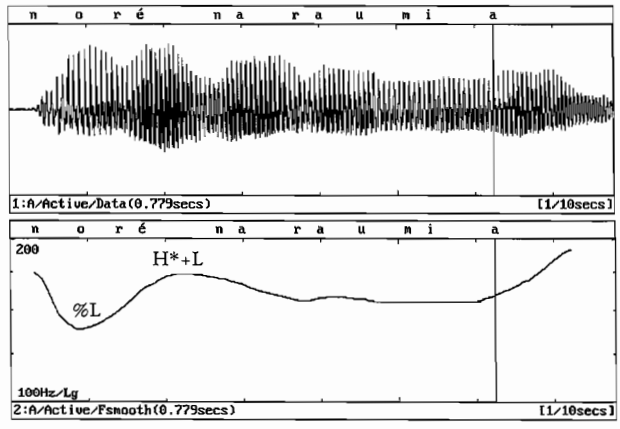

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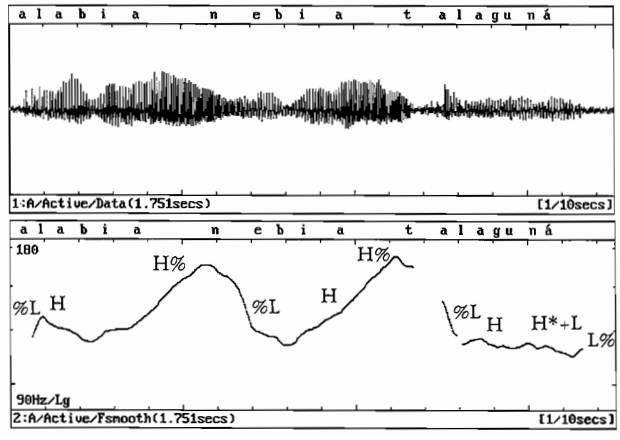

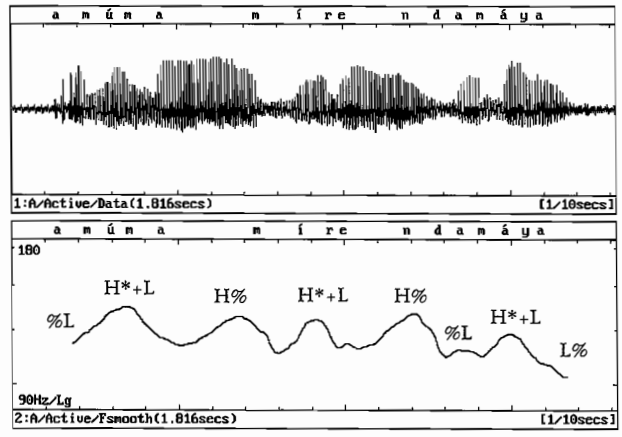

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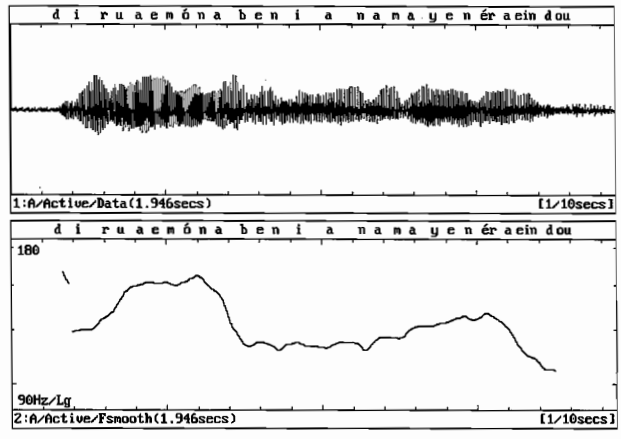

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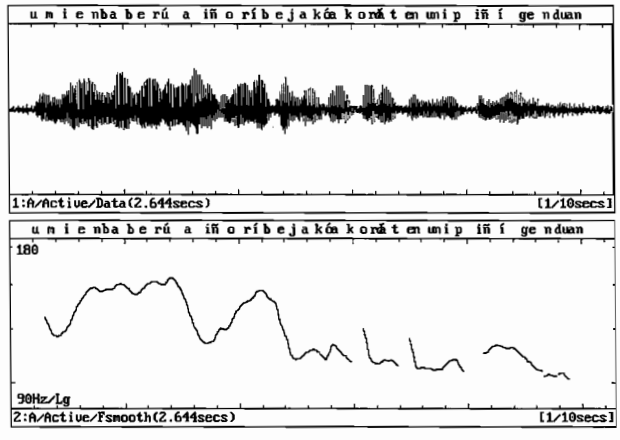

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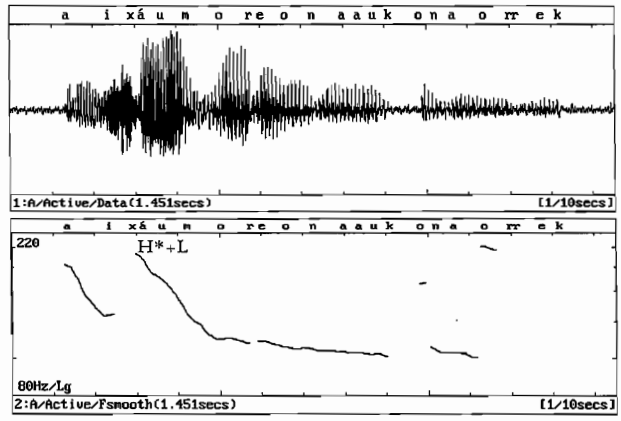
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H*+L
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Fig. 46

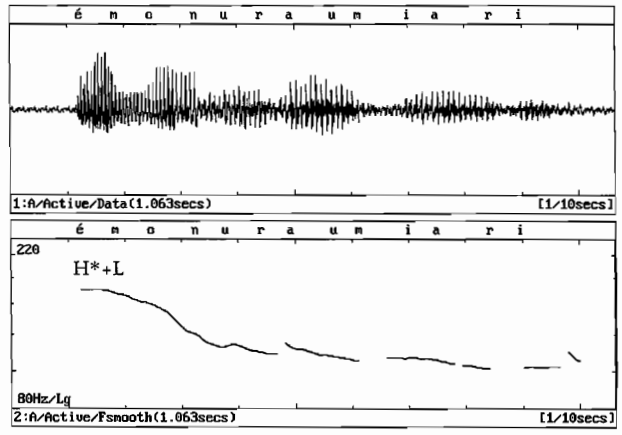
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Fig. 47