A constraint-based analysis of the intonational realization of focus in Northern Bizkaian Basque

Gorka Elordieta

Abstract

This paper analyzes patterns of prosodic prominence and intonational phrasing of narrowly focused words in a variety of Northern Bizkaian Basque. One type of speaker can only single out words intonationally if they are accented and constitute APs by themselves, while the other type can have prominence on any word which is accented, regardless of whether it constitutes an AP by itself. Lexically unaccented words which fail to get a derived pitch accent by occurring immediately before the verb cannot be singled out, and are pronounced in the same AP with the following word. These restrictions are analyzed in the framework of Optimality Theory, and are shown to derive from the interplay of five constraints. A constraint penalizing the insertion of accents dominates the constraint that demands that contrastively focalized words are intonationally singled out. This accounts for the impossibility of highlighting a lexically unaccented word unless it gets a derived accent. The difference between the two types of speakers is explained as a difference in the relative ranking of two other constraints. One of these enforces the alignment of the tonal sequence %L H- with the left edge of an AP, and of a pitch accent with the right edge of an AP. The other requires the presence of an ip-boundary at the left edge of the focused word. More restrictive speakers rank the former higher than the latter, and less restrictive speakers have the opposite ranking.

1. Introduction

Languages differ in the cues they use to make the hearer identify the focalized constituent. There are languages which signal focalized elements intonationally, without overt syntactic or morphological cues. In other languages, syntactic displacement operations are produced such that focalized words or constituents end up occupying a syntactically specified position for narrow focus, while also displaying main prosodic prominence in the sentence. Then there are languages which signal focus morphologically, by the addition of a suffix,

a prefix or some other marker that indicates focalization. This strategy can be combined with syntactic displacement, intonational marking, or a combination of both.[1] Despite all these possibilities, we will show that in pitch-accent dialects of Basque (i.e., Northern Bizkaian Basque, NBB) there are cases in which words which constitute the narrow focus of the utterance are not singled out at all, whether by syntactic, morphological or intonational means. In these dialects, intonational highlighting of narrow focus is restricted to words that bear a lexical pitch accent. Lexically unaccented words which do not occur in a position that allows them to receive a pitch accent cannot be singled out. For a group of speakers this restriction is even stronger, such that only words that bear an accent and constitute Accentual Phrases (APs) by themselves can be highlighted. It is thus not the case that any independent word can bear intonational prominence when constituting the pragmatic focus of the utterance. We discuss these cases in the following section.

2. Syntactic and prosodic constraints on focus in NBB

2.1. Lexically and morphologically conditioned accentual classes in NBB

A noteworthy feature of these dialects is the lexical distinction between unaccented and accented roots, stems and affixes, as in Japanese (cf. Poser 1984; Pierrehumbert and Beckman 1988; Haraguchi 1991; Kubozono 1993). The presence of a single accented root or affix will cause a word to surface with a pitch accent on a non-final syllable in all contexts. In a few varieties, it is always the penultimate syllable that receives a pitch accent (for Lekeitio Basque, see Hualde, Elordieta, and Elordieta 1994; Hualde 1997, 1999; Elordieta 1997, 1998).[2]

Unaccented words only receive a pitch accent if they immediately precede the verb or are uttered in isolation. In most NBB varieties, these cases display a pitch accent on the final syllable, and in a few dialects they show penultimate prominence (e.g., Ondarroa and Markina…; Hualde 1997, 2000). This kind of accent is called *derived accent* by Jun and Elordieta (1997), to distinguish it from the lexical accent of accented words. In all other contexts, unaccented words do not surface with any kind of pitch accent on any syllable.

The unaccented/accented distinction is central for intonational phrasing in NBB. Prominence is realized as a H*+L pitch accent, on the syllable that is phonologically associated with accent. As already mentioned above, accented words will always bear word-level prominence in any position in the sentence, whereas unaccented words only display a pitch accent if they are immediately left-adjacent to the verb. As shown in Jun and Elordieta (1997) and Elordieta

(1998), an utterance typically starts with an initial low tone (%L), immediately followed by a rise on the second or third syllable of the first word, an effect of a phrasal H tone (H-) phonologically associated to the second syllable.[3] The H tone is maintained as a plateau on all following syllables up to a syllable with a H*+L pitch accent, whether lexical or derived. If after that H*+L pitch accent there is another word, the contour that is observed is one in which again there is an initial low tone on the first syllable of that word, the pitch level rising again on the second or third syllable of the following word, and the high tone level plateau being maintained on all syllables until another H*+L accent, corresponding to an accented word or an unaccented word preceding the verb. And if another word follows, the same pattern is observed. Thus, a repeated sequence of low tone, rise, plateau and H*+L pitch accent is observed. The intonational units or constituents with this shape are identified by Elordieta (1997, 1998) as Accentual Phrases (APs). Schematically, the tonal structure of an AP is %L H- H*+L (cf. also Hualde et al. 2002).

Figures 1–2 illustrate the general shape of APs in NBB, corresponding to (1a–b), respectively. The F_0 contours in those figures are uttered by the same female speaker of LB, ID. The sentence in Figure 1 contains three unaccented words before the verb; from an IP-initial %L there is a rise on the second syllable, reaching the peak on the third syllable, and the H tone continues until the H*+L pitch accent on the final syllable of the third word (i.e., the one immediately preceding the verb, with the derived accent). The pitch drops on the verb and stays low until the end of the utterance. Figure 2 contains two accented words, each of them with their corresponding H*+L pitch accent. Due to downstep, the second phrasal H- does not rise as much as the first one, and the second peak is smaller than the first one (Elordieta 1997, 1998; Jun and Elordieta 1997).[4]

(1) a. $_{AP}$(%L H- H*+L)
alargunen nebien diruá galdu dot
widow-gen brother-gen money-abs lose aux

'I have lost the widow's brother's money'

b. $_{AP}$(%L H*+L) $_{AP}$(%L H-H*+L)
amúmen liburúak biar doras
grandmother-gen books-abs need aux
'I need grandmother's books'

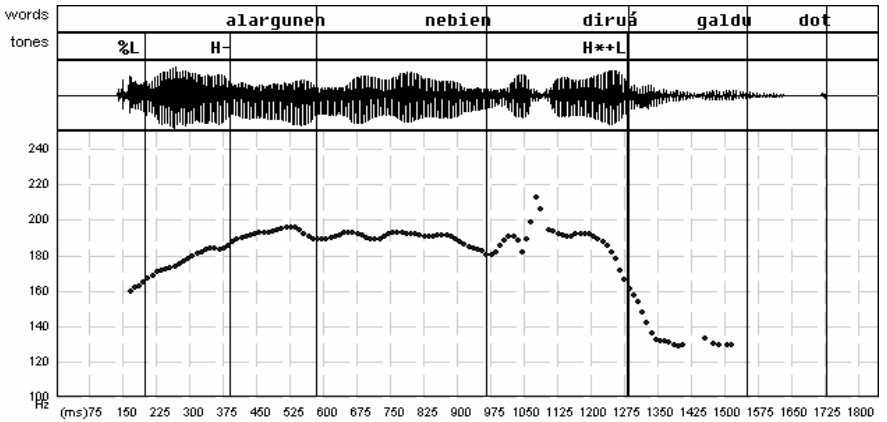

Figure 1 . F_0-track of sentence (1a) by speaker ID. It illustrates a single AP consisting of an initial rise and a sustained H tone level and ending with a H*+L pitch accent.

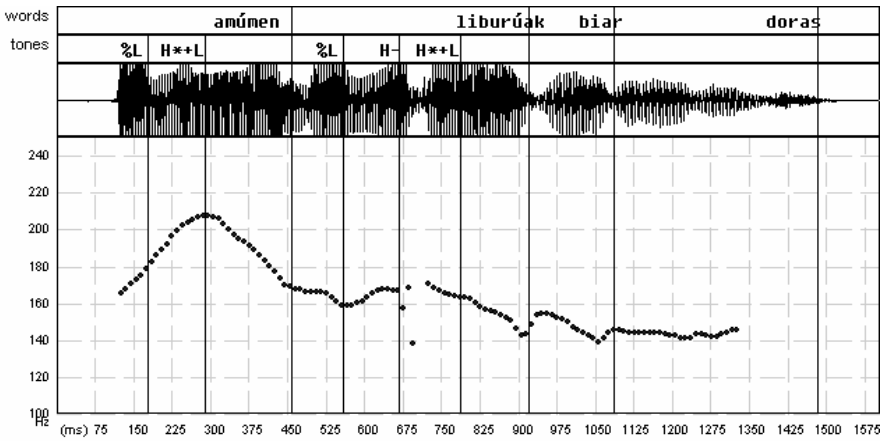

Figure 2. F_0-track of sentence (1b) by speaker ID. It illustrates two APs, each with an initial rise and a pitch accent. The accent in the second AP is downstepped.

2.2. Intonational restrictions on the assignment of prominence to focalized words

Basque has flexible word order, but only words contained in an immediately preverbal syntactic constituent can be focalized. The focused word need not itself immediately precede the verb, but be contained in a syntactic phrase that does. While (2a–b) are grammatical, (2c–f) are not. Syntactic constituency is indicated by square brackets. For detailed discussions and syntactic analyses that could explain this constraint, see Ortiz de Urbina (1989, 1995); Hualde et al. (1994); Elordieta (2001); Arregi (2002); Etxepare and Ortiz de Urbina (2003).[5]

(2) a. *[maixuári] [lagúnen LIBURÚAK] emon dotzaras.*
teacher-dat friends-gen BOOKS-abs give aux
'I have given the friends' BOOKS to the teacher'

b. *[maixuári] [LAGÚNEN liburúak] emon dotzaras.*
teacher-dat FRIENDS-gen books give aux
'I have given THE FRIENDS' books to the teacher'

c. **[MAIXUÁRI] [lagúnen liburúak] emon dotzaras.*
TEACHER-dat friends-gen books give aux

d. **[lagúnen liburúak] emon dotzaras [MAIXUÁRI]*
friends-gen books give aux
TEACHER-dat

e. **[maixuári] emon dotzaras [LAGÚNEN liburúak]*
teacher-dat give aux
FRIENDS-gen books-abs

f. **[maixuári] emon dotzaras [lagúnen LIBURÚAK]*
teacher-dat give aux friends-gen BOOKS-abs

Let us now illustrate the intonational realization of focus in LB, in narrow non-contrastive focus and in narrow contrastive focus.

2.2.1. Narrow non-contrastive focus

Example (3) (repeated from (1b)) contains only one preverbal constituent with two accented words, *amúmen* 'grandmother's' and *liburúak* 'books'.

(3) $_{AP}$(%L H*+L) $_{AP}$(%L H-H*+L)
| | | | |
amúmen *liburúak* *biar* *doras*
grandmother-gen books-abs need aux
'I need grandmother's books'

Both amúmen and liburúak can be pronounced as the most prominent words in the utterance under narrow focus. Figure 3 illustrates an F0 contour in which the second word is focalized, and has a higher pitch peak than the equivalent word in a broad focus utterance. It does not undergo downstep, and is followed by a decreased pitch level. However, this realization is more typical of emphatic pronunciations and does not always obtain. In fact, in non-emphatic speech most speakers often produce narrow-focus contours which are intonationally very similar to broad-focus contours. In addition, some speakers produce a second type of realization of narrow focus which involves peak delay on the word preceding the focused word, accompanied in some instances by a continuation rise.

These cues on the prefocal word signal old information or topic status for that word (cf. Figure 4, discussed below).[6]

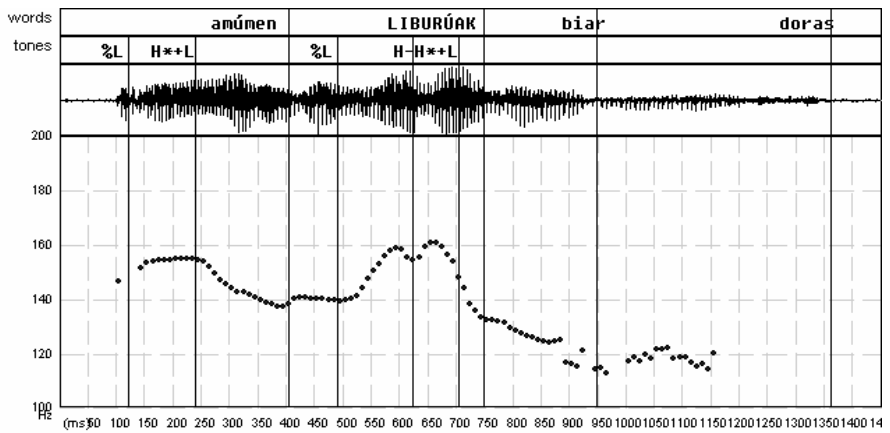

Figure 3. F_0-track of sentence (3), by speaker ED, where the word *liburúak* is focused. This word presents a higher pitch level than the first word, canceling downstep.

A similar scenario would apply for a constituent preceding the verb which contained an accented and an unaccented word, as in (4). The accented word has a lexical H*+L accent, and the unaccented word receives a derived H*+L

pitch accent on its final syllable because it precedes the verb. An example with narrow focus on the second word is presented in Figure 4 (by speaker MI). In this case, the speaker produced peak delay in the first word, and the second word does not present a higher pitch than the first word.

(4) $_{AP}$(%L H*+L) $_{AP}$(%L H-H*+L)
| | | | |
Amáien *alabiá* *topa dot*
Amaia-gen daughter-abs find aux
'I ran across Amaia's daughter'

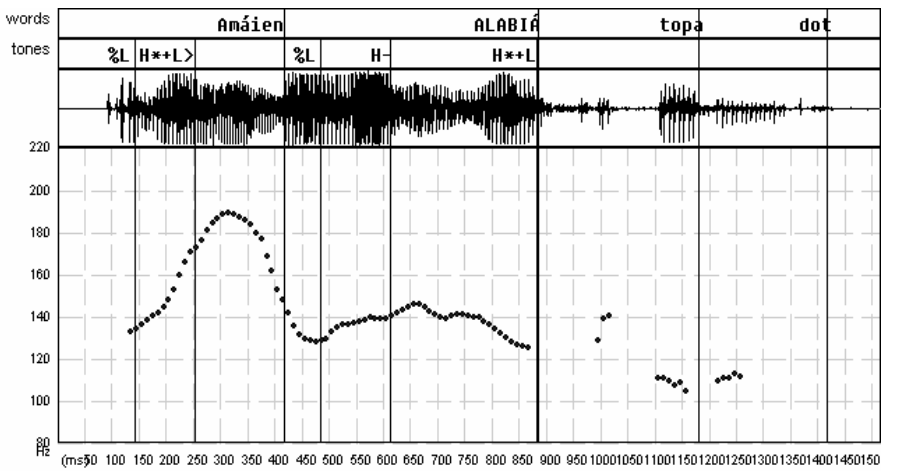

Figure 4. F_0-track of sentence (4), by speaker MI, where the word *alabiá* is focused. There is peak delay in the first word, and the focused word does not have a higher pitch level.

In addition to the syntactic restriction on narrow focus (i.e., that a word in narrow focus must be contained in the preverbal syntactic phrase), there are prosodic conditions that a word bearing the narrow focus information must fulfill in order to be intonationally singled out. The minimum requirement is that the narrowly focalized word must bear a pitch accent, either lexical or derived. In NBB, focus does not insert accents that are not already there lexically or by virtue of a preverbal position. Thus, a lexically unaccented word which is the narrow focus of an utterance, but which is not in the position that grants a derived accent cannot be made more prominent intonationally. From a neutral sentence such as (5), the leftmost lexically unaccented word, *nebien*

would not receive main prominence even though it were the narrow focus of the sentence (as an answer to *Whose money have you lost?*), because it does not have a pitch accent. This word has to be pronounced in an AP with the following word, in the same pitch level (cf. Figure 5).

(5) $_{AP}$(%L H- H*+L)
| | |
nebien diruá galdu dot
brother-gen money-abs lose aux
'I have lost the brother's money'

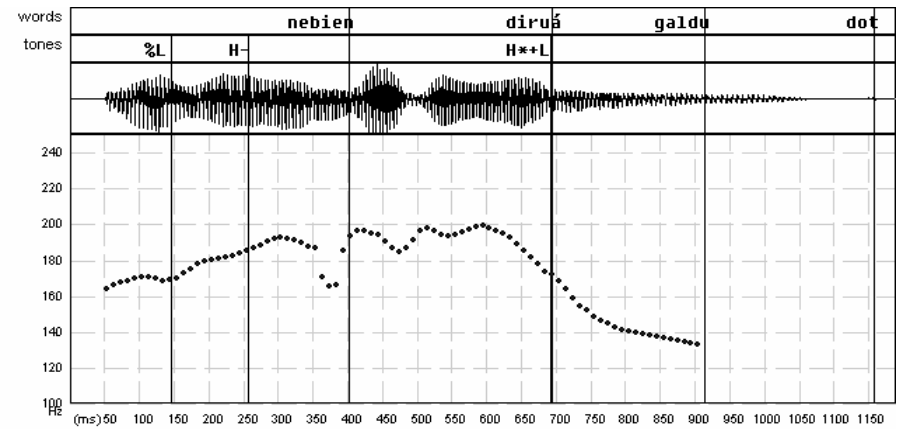

Figure 5. F_0-track of sentence (5), by speaker ID, where the first word is focused. This word cannot be singled out, but pronounced in the same AP with the following word.

If the second word is intended to bear narrow focus, as an answer to a question such as *What is it of your brother's that you have lost?*, two possible patterns are found, subject to speaker variation. Of the five speakers recorded, for three speakers it is not possible to highlight the second word, *diruá*. The two words in the preverbal syntactic constituent (*nebien diruá* 'brother's money') have to be pronounced in the same pitch level, in the same AP. The contour observed in these instances is similar to the one illustrated in Figure 5, which showed the impossibility of having the leftmost word as the most prominent word in the utterance. However, these speakers can highlight the second word in a sentence such as (4), the word with derived accent *alabiá*. Why cannot these speakers assign focal prominence to the lexically unaccented word with derived accent (*diruá*) in (5)? The difference between (4) and (5) is that in (4)

the word with the derived accent *alabiá* is preceded by a lexically accented word, *Amáien*, whereas in (5) the word with the derived accent *diruá* is preceded by the lexically unaccented word *nebien*, which does not get a pitch accent. Intonationally, the difference is that in (4) the two words in the preverbal phrase are in two separate APs (cf. the intonational structure in (4)), whereas in (5) there is only one AP. As the intonational schema in (5) shows, the first unaccented word starts an AP, with the initial %L H- tone sequence, but since it does not have a pitch accent, it does not end an AP, and the phrasal H- tone continues onto the next word, until the derived H*+L accent of *diruá* ends the AP. The explanation for the behavior of these speakers would thus be that for them there is a constraint that demands that only words which constitute APs by themselves can be made intonationally prominent. That is, bearing a pitch accent is a necessary but not a sufficient condition for standing out intonationally. In cases of two words with accent, such as the ones in (4), each word constitutes its own AP, and can thus be singled out intonationally. But in cases in which the first word is lexically unaccented and does not get a derived accent, there is no AP boundary separating it from the second word, and hence the second word does not constitute an AP by itself (neither does the first word, obviously). Rather, it continues the AP that the first word started, and hence none of the words can be intonationally singled out.

On the other hand, for the other two speakers the word *diruá* could receive main prominence in a substantial number of utterances. As shown in Figure 6, one of the strategies in these cases is a continuation rise at the end of the word preceding the focalized word, followed by a drop in pitch and a subsequent rise at the beginning of the focalized word, indicating that a new AP starts. The rise at the end of the first word cannot be due to a pitch accent (as the word is unaccented), so it must be a boundary tone signaling old or known information. Another possibility (not illustrated for reasons of space limitations) is to have a sustained pitch at the end of the word preceding the focalized word, followed by a rise in pitch level on the focalized word (other non-intonational features such as higher intensity may also surface).[7]

For these two speakers, then, the constraint that demands that a word is singled out only if it constitutes an AP by itself is too strong. It appears that for these speakers a word in narrow focus that has a pitch accent (lexical or derived) can be intonationally highlighted, even if it does not constitute an AP by itself. It may thus be a sufficient condition that a word bear a pitch accent in order to be assigned focal prominence. In this sense, these speakers are less restrictive than the others. However, for all the speakers the constraint that prohibits inserting a pitch accent on words that do not already have a lexical or derived accent applies strongly, even for focalization. That is why the first

unaccented word in (5), *nebien*, cannot be singled out under narrow focus by any of the speakers.

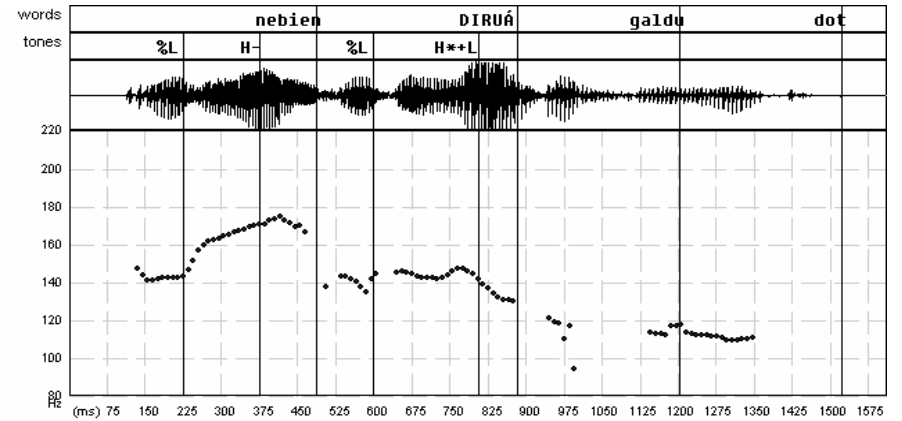

Figure 6. F_0-track of sentence (5), by speaker MI, where the word *diruá* is focused. This word is singled out by having a final rise at the end of the preceding word followed by a pitch fall and a subsequent pitch rise in the focused word.

The impossibility of assigning main prominence to a word in narrow focus if it does not have a lexical or derived accent or, for the more restrictive speakers, if it does not constitute an AP by itself is interesting from a typological point of view as well. Nothing similar is found in neighboring languages such as Spanish or French, or in Indo-European languages in general (see Elordieta 2006a for a crosslinguistic overview of different strategies for assigning prominence to a word in narrow focus).

2.2.2. Narrow contrastive focus

By narrow contrastive focus we mean those contexts in which the speaker corrects one of the words or syntactic phrases that her interlocutor has stated incorrectly.

(6) a. *Nóren alabia topa dosula? Alaznena?*
whose daughter-abs find aux Alazne-gen
'Whose daughter did you run across? Alazne's?'

b. *Es, AMÁIEN alabiá topa dot.*
no AMAIA-gen daughter-abs find aux
'No, I ran across AMAIA's daughter.'

The word *Amáien* can be made more prominent by having a boosted pitch level, higher than in narrow non-corrective focus, followed by a decreased pitch level in the rest of the material in the sentence (Elordieta 1997, 2003 for examples and F_0 contours and Elordieta 2006a for a description of the phonetic realization of this type of cases). Prominence on the second word *alabiá* (given the appropriate triggering context) would be achieved by the same means, or by a delayed peak or continuation rise in the preceding word, followed by a regular downstepped pitch level on the focalized word. The focalized word is often accompanied by higher intensity and longer duration.[8]

In cases in which the first word is unaccented, forming an AP with the following word, as in (5) above, we still find a similar kind of speaker variation as in narrow non-contrastive focus. The two speakers that we identified as less restrictive above behave similarly in narrow contrastive focus as well. That is, they can give a higher prominence level to the second word, as it has a derived accent. The difference with non-contrastive contexts is that in contrastive focus this pattern becomes almost categorical, whereas in non-contrastive contexts this possibility is not categorical. An example is provided in (7).

(7) a. *Ser biar dosula lagunena? Kuadernúa?*
what need aux friend-gen notebook-abs
'What is it of the/your friend's that you need? His notebook?'

b. *Es, lagunen LIBURÚA biar dot.*
no friend-gen BOOK-abs need aux
'No, I need the/my friend's BOOK'.

Prominence in narrow contrastive focus is cued by a rise in pitch on the focalized word coming from a sustained pitch of the unaccented word, or by a rise at the end of the preceding unaccented word. Under both realizations, the focalized word usually displays higher intensity and duration (Elordieta and Hualde 2001, 2003). For a sentence such as (7b), Figure 7 illustrates an F0 contour in which the first option is realized, and Figure 8 illustrates the second possibility, with a rise at the end of the first word.

The speakers identified in cases of non-contrastive focus as more restrictive present a slightly more complex pattern. For these speakers, in narrow non-contrastive focus a word has to constitute an AP by itself in order to be the most prominent word in the utterance (i.e., it is not sufficient that the word bears an accent). Although most of the time these speakers maintain this pattern in contrastive focus as well (i.e., the whole AP is pronounced together, perhaps with a higher pitch and greater intensity and duration), occasionally

they pronounce the second word with main intonational prominence. In these instances there is then no difference among speakers. But still in most cases the more restrictive speakers follow the same pattern as in non-contrastive focus.

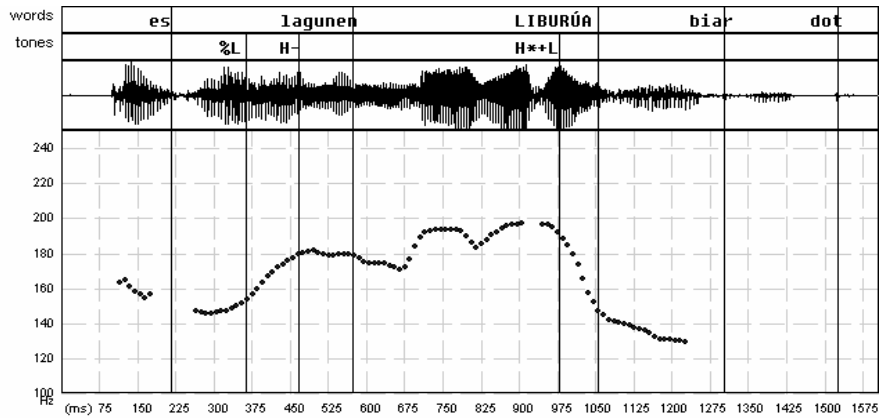

Figure 7. F_0-track of sentence (7b), by speaker ED, where the word *liburúa* is focused. This word is singled out by having a higher pitch level than the preceding word, followed by a big pitch fall.

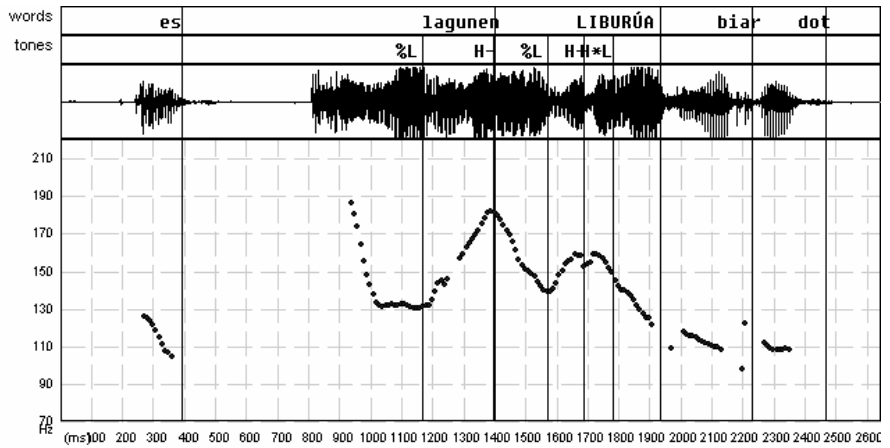

Figure 8. F_0-track of sentence (7b), by speaker MI, where the word *liburúa* is focused. This word is singled out by having a final rise at the end of the preceding word followed by a pitch fall and a subsequent pitch rise in the focused word.

The following table summarizes the different possibilities in NBB for highlighting words in narrow focus (contrastive and non-contrastive) for combina-

tions of accented and unaccented words in a preverbal phrase. The choices by the two types of speakers are also represented (the end results are the same in the first two combinations).[9]

Table 1. Intonational restrictions on the highlighting of words in narrow focus

(a) H*+L H*+L | | $_{AP}$(*Accented*)–$_{AP}$(*Accented*) – *Verb* More restrictive speakers: Both words can be highlighted, because they form their own APs. Less restrictive speakers: Both words can be highlighted, because they have a pitch accent.
(b) H*+L H*+L | | $_{AP}$(*Accented*)–$_{AP}$(*Unaccented*) – *Verb* More restrictive: Both words can be highlighted, because they form their own APs. Less restrictive: Both words can be highlighted, because they have a pitch accent.
(c) H*+L | $_{AP}$(*Unaccented–Accented*) – *Verb* More restrictive: Neither word can be highlighted, because they do not form their own APs. Less restrictive: The accented word can be highlighted, because it has a pitch accent. The unaccented word cannot be highlighted because it does not have a pitch accent.
(d) H*+L | $_{AP}$(*Unaccented–Unaccented*) – *Verb* More restrictive: Neither word can be highlighted, because they do not form their own APs. Less restrictive: The second unaccented word can be highlighted, because it has a pitch accent. The unaccented word cannot be highlighted because it does not have a pitch accent.

In the formal analysis in section 3, we shall look at cases (b) and (c) in Table 1 more closely.

2.2.3. Insertion of Intermediate Phrase boundaries

An important aspect of focus in NBB is that when a constituent in narrow or corrective focus is singled out prosodically, a phrasing boundary is inserted on its left edge. Such a boundary is evidenced by two alternative cues, already mentioned in the previous section. One possibility is that the constituent under focus may surface with a higher peak than in broad focus, or higher than what the regular downstep process applying in NBB to a H*+L pitch accent following another H*+L in its same phrase would allow for. A comparison of the pronunciation of the word *liburúak* 'books' in a neutral or broad focus context shown in Figure 2 above and a pronunciation of the same word in narrow focus shown in Figure 3 illustrates this difference. The word *liburúak* in Figure 3 presents a much higher peak than in Figure 2. Downstep can also be blocked in neutral or broad focus contexts in a predictive manner, as Elordieta (1997, 1998), Jun and Elordieta (1997) and Elordieta, Gaminde, Hernáez, Salaberria and Martin (1999) showed. Basically, downstep is blocked at the left edge of a syntactic maximal projection, a fact that was interpreted as an indication of the presence of a prosodic boundary aligned with the left edge of a syntactic maximal projection. Such a boundary belongs to an intonational constituent of a higher order than an AP, namely an Intermediate Phrase (ip) (the alignment of edges of syntactic maximal projections with edges of prosodic constituents such as Phonological Phrases or Major Phrases is discussed in Selkirk 1986; Sekirk and Tateishi 1991; Truckenbrodt 1995, 1999).[10]

Another cue for the presence of a break is a displacement of the peak of the prefocal word to the posttonic syllable, or for some speakers even a continuation rise in the final syllable, features which are typical of topics. When this strategy is used, the peak in the focused word does not have to be higher than in broad focus utterances. An example of this pattern was presented in Figures 4, 6, and 8. The delayed peak and/or continuation rises are indicators of the presence of a boundary between intonational constituents of a higher order than APs, and we take them to be ip boundaries. Native speakers' intuitions about these breaks are that they are not boundaries of the highest order, i.e., IP boundaries.

After having presented a description of the constraints affecting the prosodic realization of focus in NBB, in the following section I will provide a formal analysis of these constraints. Given the existence of such constraints, it is an inescapable conclusion that the theoretical framework that seems best suited to

account for a formalization of the patterns observed is one that assigns a crucial role to constraints as driving forces in the selection of outputs in human languages, Optimality Theory being the best-known framework.[11]

3. A formal account of the syntactic and intonational restrictions on focus realization

Let us recapitulate the syntactic and intonational restrictions on the prosodic realization of focus in LB. In order for a word to receive main prosodic prominence as a focalized word, it must first satisfy the syntactic condition that it be contained in the phrase immediately preceding the verb. Second, the focalized word must satisfy one of the following intonational constraints: it must constitute an AP by itself (for the more restrictive speakers) or it must bear a pitch accent, lexical or derived, even if it does not constitute an AP by itself. Both types of speakers adhere to the constraint that if a word does not bear an accent, focalization cannot assign a pitch accent to it. This is why lexically unaccented words which do not get a derived accent (i.e., those which do not occur in preverbal position) cannot be singled out.

There must be a constraint in NBB prohibiting the insertion of pitch accents on words which do not have them by virtue of their lexical specification or their syntactic position. A faithfulness constraint such as DEP-T* penalizes the insertion of pitch accents which are not already present in the input, in the lexical specification of a word. That is, in underlying representation accented words would be specified with a H*+L pitch accent (or T*, in a more general formulation, without specifications about actual placement of prominence on any given syllable, which would be left to other constraints), and unaccented words would be left unspecified for pitch accent.[12]

(8) DEP-T*: an output T* must have a correspondent in the input.

This constraint must be highly ranked in NBB. Lexically unaccented words, which do not possess a pitch accent underlyingly, must not be assigned an accent, and it is DEP-T* that must prevent this. However, DEP-T* cannot be undominated, since unaccented word must surface with a derived pitch accent when immediately preceding the verb, even in neutral declarative sentences. Thus, a constraint like (9) must be assumed to dominate DEP-T*.

(9) INF(ORMATION) FOC(US):
"Assign T* to rightmost word in rightmost preverbal syntactic constituent."[13]

In turn, DEP-T* must dominate a constraint that is very common crosslinguistically, one that enforces the assignment of main intonational prominence to a narrowly focalized word (more commonly in contrastive focus), which we call HIGHLIGHT. This constraint demands that the word in narrow contrastive focus stands out in the utterance, and it is violated if the word bearing narrow focus information does not surface with the most prominent accent in the utterance, because other words in the utterance are equally prominent or more prominent.[14]

(10) HIGHLIGHT:
"Assign main prosodic prominence to the word or constituent bearing narrow contrastive focus."

This constraint goes back to a rule that interprets focus phonologically, formulated by Jackendoff (1972: 237): "If a phrase P is chosen as the focus of a sentence S, the highest stress in S will be on the syllable that is assigned highest stress by the regular stress rules". This rule is stated in different terms by Truckenbrodt (1995: 165): "If F is a focus and DF is its domain, then the highest prominence in DF will be within F". In metrical terms, by this constraint the accented syllable of the narrowly focalized word would have the highest number of grid-marks (in the sense of Halle and Vergnaud 1987). In NBB, this prominent accent is tonally realized as a H*+L pitch accent. In phonetic realization, the H*+L pitch accent associated to the focalized word is distinguished by having the biggest pitch fall after it. There may be other pitch accents in the utterance, but the pitch level is not as reduced and compressed as after the pitch accent on the focalized word. As described in section 2.2, in NBB one strategy to achieve main prominence is to increase the scaling level of the pitch accent, as in many other languages. Another strategy is to have the focalized word appear as the only word with a pitch accent after a H- boundary tone. Even if the pitch level is not boosted as in the first strategy, the region following the focalized word (i.e., the verb and whatever may follow) has a decreased pitch level (cf. Figures 4 and 6). That is, the focalized word is singled out as the word with a H*+L pitch accent after which the pitch level decreases, until the end of the utterance.

The left edge of a word conveying contrastive narrow focus is aligned with the left edge of an ip. This pattern arises through an alignment constraint of the interface between the syntactic and prosodic components.

(11) ALIGN-CF-IP,L: ALIGN (CONTRASTIVE FOCUS, L; IP, L)
"Align the left edge of a Narrow Contrastive Focus constituent in the informational or syntactic structure with the left edge of an ip"

It is important to stress that ALIGN-CF-IP,L is not a simple implementation of HIGHLIGHT and that the two constraints are independently necessary. Some languages realize main intonational prominence by an increase in pitch range without phrasing effects, as in English, or phrasing effects with or without pitch range modifications, as in Hungarian, Korean or Hausa. However, it is true that in languages in which focus is realized through prominence and phrasing (as in Basque) the two constraints may be violated or satisfied hand-in-hand (as will be shown below).

As described in the previous section, in LB the more restrictive speakers do not single out words bearing narrow focus when they do not constitute independent APs. That is, these speakers do not insert ip boundaries on the left edge of focalized words unless they are aligned with left-edge AP boundaries. This means that there must be a constraint that enforces the alignment of left edges of ips with left edges of APs, disallowing free insertion of ips, even those that could be associated to words or constituents under contrastive focus. This constraint could be formulated as in (12):

(12) ALIGN IP-AP,L: ALIGN (IP, L; AP, L)
"Align the left edge of an ip with the left edge of an AP"

As an anonymous reviewer points out, however, it is not clear that this constraint is violable. It might represent a more general property of prosodic phonology, namely that a boundary of a prosodic constituent of a higher order in the prosodic hierarchy implies the presence of a boundary of a lower constituent in the same place. Obviously, the opposite does not hold, that a lower constituent boundary is aligned with a higher constituent boundary, because a lower constituent may be internal to the higher constituent, i.e., the higher constituent may contain more than one constituent of the lower level. The constraint we refer to here ensures that the edges of a higher prosodic constituent are aligned with the edges of a lower constituent. An Utterance boundary cannot be inserted in the middle of an Intonational Phrase, or a Phonological Phrase boundary cannot be inserted in the middle of a Prosodic Word (Selkirk

1984, 1995; Nespor and Vogel 1986). Hence, an ip boundary cannot be inserted in the middle of an AP. In fact, this property holds of morphological or syntactic representations as well. For instance, a Verb Phrase boundary cannot start or end in the middle of a direct or indirect object; that is, the left or right edge of a Verb Phrase must be aligned with the left or right edge of a constituent it dominates. Thus, it seems that a constraint such as (12) is part of a more general constraint of grammar. If it is an inviolable constraint, then perhaps it is part of GEN, the generator of candidates in an Optimality Theory model of grammar (Prince and Smolensky 1993; Kager 1999), and no candidates are generated that do not satisfy this constraint. This is a plausible hypothesis that will be adopted in the analysis of the NBB facts, that is, ALIGN IP-AP,L will not be included in the set of constraints. But even if it were included among the violable constraints, it is clear that it would have to be higher ranked than ALIGN CF-IP,L.

In either case, ALIGN IP-AP,L or its more general inviolable counterpart would be satisfied by inserting APs freely wherever ips were also inserted. In NBB there are two constraints regulating free insertion of APs (i.e., governing the assignment of AP boundaries in the right places). As described in section 2.1, the left edge of an AP is aligned with the left edge of a word with a %L boundary tone and a H- phrasal tone, and the right edge of an AP is aligned with the right edge of a word bearing a H*+L pitch accent. We cannot simply say that the right edge of an AP aligns with a pitch accent, because in LB lexically accented words have penultimate rather than final accent. We formalize these constraints as (13) and (14), respectively. In (14) the symbol PWD* is used in order to refer to a prosodic word with a pitch accent.

(13) ALIGN-AP, L: ALIGN (AP, L; %LH-, L)
"Align the left edge of an AP with the left edge of a %L H- tonal sequence"

(14) ALIGN-AP, R: ALIGN (AP, R; PWD*, R)
"Align the right edge of an AP with the right edge of a word bearing a pitch accent"[15]

These two constraints govern the distribution of tones in intonational constituents, but they are also in conflict with constraints such as Dep-T*, which prohibits the insertion of pitch accents not present in the input representation as part of the lexical specification of words. In fact, Dep-T* is higher ranked than Align-AP,R. For the sake of simplicity, (13) and (14) will be represented as a combined constraint, Align-AP, which penalizes the presence of left-edge AP

boundaries without the tonal sequence %L H- and the presence of right-edge AP words without a pitch accent.

Let us proceed now to discuss the way the constraints in (8)–(14) interact to produce the observed outputs in LB, the variety of NBB studied in this paper. The examples will involve narrow contrastive focus, because words are more clearly highlighted in contexts of narrow contrastive focus. Our theoretical assumption will be that the input representation is a sentence with syntactic structure and the specification of which word or constituent is contrastively focalized. In the input there are also lexical specifications on accent (i.e., words which are lexically specified to bear an accent will contain this information). Prosodic phrasing and assignments of prominence are not included in the input, but are generated on different candidate outputs by GEN. That is, intonational constituency (APs, ips) and prosodic prominence is not part of the input but of the output. It is the intonational constituency and the assignment of prosodic prominence that is evaluated on the different candidates by the set of constraints in (8)–(14), hierarchically ordered.

The examples that will serve as input sentences are (15) and (16), each containing two words in the preverbal phrase.

(15) *Amáien alabiá topa dot.*
Amaia-gen daughter-abs find aux
'I have run across Amaia's daughter.'

(16) *lagunen liburúa biar dot.*
friend-gen book-abs need aux
'I need the friend's book'.

These two sentences are examples of the schematized contexts (b) and (c) in Table 1, respectively. (15) contains two words in the same syntactic phrase before the verb: a lexically accented word (*Amáien*) and a lexically unaccented word that gets a derived accent (in its final syllable) because of its preverbal position (*alabiá*). (16) contains two lexically unaccented words, of which the second one gets a derived pitch accent because it precedes the verb. These sentences have the same output phrasing and prominence also as examples (a) and (d), respectively, in Table 1. The reason for these similarities is that even though the second word is unaccented in (b) and accented in (a), in both cases the two words have an accent (derived in the case of (b) and lexical in the case of (a)). The same parallelism exists between (c) and (d): the second word is accented in (c) and unaccented in (d), but in the end both words surface with a pitch accent. Much of the analysis will thus be the same for these pairs of

cases. Further discussion of the input differences are left out for reasons of space. We shall however study the grammatical differences between the more or less restrictive speakers.

An important aspect of the theoretical analysis should be discussed at this point. Under the theoretical assumption presented above, focus-induced prominence is assigned or associated in parallel or at the same time that intonational constituency is formed. GEN produces outputs with different intonational constituency *and* prosodic prominence. If so, the differences in focus realization described in section 2.2 and summarized in Table 1 cannot be explained by making reference to a previously established intonational constituent structure, with APs and ips. Although they are useful descriptive generalizations, these differences should be explained in other terms. We argue that they result from a different relative ranking of two constraints.

The only differences between speakers are found in the second case, i.e., in (16), concretely when the second word is contrastive focus. Hence, we will start with this scenario first, because it will be the one revealing the differences between speakers. (17b) would be the utterance illustrating this case, as a response to (18a) (already presented as (7) in section 2.2.3). Capitals only indicate semantic focalization.

(17) a. *Ser biar dosula lagunena? Kuadernúa?*
what need aux friend-gen notebook-abs
'What is it of the friend's that you need? His notebook?'

b. *Es, lagunen LIBURÚA biar dot.*
no friend-gen BOOK-abs need aux
'No, I need the friend's BOOK'.

As was described in section 2 more restrictive speakers would not be able to highlight the word *liburúa,* because it does not constitute an AP by itself. The two words would be pronounced in the same AP, with no boundary between them; there would be a pitch rise at the left edge of the first word, *lagunen*, with a high pitch level maintained until the derived pitch accent in the penultimate syllable of the accented word *liburúa*. According to the above mentioned descriptions, less restrictive speakers can assign main prominence to this word because it bears a pitch accent, a lexical one. The following tableau shows how these descriptive generalizations are derived. In the input representation, the two words are contained in the same Determiner Phrase, and the focalized word appears between brackets with the index *F*. The specification that *liburúa* bears a lexical accent is indicated with an apostrophe preceding the word. In a

winning output, the pitch accent should be assigned to the penultimate syllable. To simplify the illustration, all candidates have a pitch accent on the penultimate syllable. In the output candidates, ips are indicated by square brackets and APs are indicated by round brackets. Main prosodic prominence is signaled by boldface.

(18) More restrictive speakers

$_{DP}$[lagunen $_{F}$('liburua)] biar dot	INF FOC	DEP-T*	ALIGN AP	ALIGN CF-IP,L	HIGH-LIGHT
☞ a. %L H- H*+L | | | $_{ip}$[$_{AP}$(**lagunen liburúa**)] biar dot				*	*
b. %L H- %L H- H*+L | | | | | $_{ip}$[$_{AP}$(lagunen)] $_{ip}$[$_{AP}$(**liburúa**)] biar dot			*!		
c. %L H- H*+L %L H- H*+L | | | | | | $_{ip}$[$_{AP}$(lagunén)] $_{ip}$[$_{AP}$(**liburúa**)] biar dot		*!			

INFFOC, which demands that a word that precedes the verb has to have a pitch accent, is undominated. There are no utterances in which the word immediately preceding the verb fails to have a pitch accent, which means that INFFOC is a top-ranked constraint. In the case at hand, *liburúa* satisfies this constraint with its lexical accent.

The correct results are obtained by ranking DEP-T* and ALIGN-AP above HIGHLIGHT and ALIGN CF-IP,L. The winning candidate (a) violates HIGHLIGHT, as the focalized word *liburúa* is not assigned main prosodic prominence, but is pronounced in the same AP and ip with the preceding word. This candidate also violates ALIGN CF-IP,L, because no ip boundary in inserted at the left edge of *liburúa*. On the other hand, in candidates (b) and (c) the word *liburúa* is singled out as the word with main prosodic prominence, thus satisfying HIGHLIGHT. An ip boundary is inserted at the left edge of this word, obeying ALIGN CF-IP,L (an AP boundary is also inserted, by GEN or by the higher-ranked constraint ALIGN IP-AP,L, cf. the discussion on (12)). However, candidate (b) incurs in a violation of ALIGN-AP. The presence of an AP boundary at the left edge of *liburúa* implies the presence of an AP boundary at the right edge of *lagunen*, and this AP does not conform to the constraint

ALIGN-AP, which demands that the right edge of an AP should be marked by a H*+L pitch accent, on the final or penultimate syllable. But there is no pitch accent on the lexically unaccented *lagunen*, which would only get an accent on its final syllable if it were in preverbal position, that is, a derived accent. This violation makes this candidate worse than candidate (a), given the higher ranking of ALIGN-AP over HIGHLIGHT and ALIGN CF-IP,L. Candidate (c) does not violate ALIGN-AP, as a pitch accent appears at the right edge of the AP containing *lagunen*, but this pitch accent was not part of the lexical specification of the utterance, that is, the word *lagunen* is a lexically unaccented word, and hence inserting a pitch accent means violating DEP-T*. The higher ranking of this constraint over HIGHLIGHT and ALIGN CF-IP,L makes this constraint worse than candidate (a) as well. Thus, candidate (a) is the winning candidate, in spite of its violations of lower ranked HIGHLIGHT and ALIGN CF-IP,L. In the absence of positive evidence, DEP-T* and ALIGN-AP are unranked with respect to each other, and so are HIGHLIGHT and ALIGN CF-IP,L.

Let us now compare this result with that of the less restrictive speakers, who can single out the word *liburúa*. The argument pursued here is that this difference stems from a difference in the ranking of the constraints ALIGN-AP and ALIGN CF-IP,L, namely that ALIGN CF-IP,L is ranked higher than ALIGN-AP for the less restrictive speakers. This can be observed in the following tableau, where for ease of comparison the same candidates as in (18) are presented in the same order.

(19) Less restrictive speakers

$_{DP}$[lagunen $_{F}$('liburua)] biar dot	INF FOC	DEP-T*	ALIGN CF-IP,L	ALIGN AP	HIGH-LIGHT
a. %L H- H*+L | | | $_{ip}$[$_{AP}$(**lagunen liburúa**)] biar dot			*!		*
☞ b. %L H- %L H- H*+L | | | | | $_{ip}$[$_{AP}$(lagunen)] $_{ip}$[$_{AP}$(**liburúa**)] biar dot				*	
c. %L H- H*+L %L H- H*+L | | | | | | $_{ip}$[$_{AP}$(lagunén)] $_{ip}$[$_{AP}$(**liburúa**)] biar dot		*!			

As explained above, the winning candidate (b) satisfies Highlight by making the focalized word stand out. Importantly, it also obeys Align CF-ip,L by inserting an ip boundary to the left of liburúa. Satisfying this constraint means that it violates Align-AP, due to the absence of a pitch accent on the right edge of the AP containing the preceding word lagunen, but this constraint is ranked lower than Align CF-ip,L in the grammar of these speakers. Candidate (a) was a winner over (b) in the grammar of the more restrictive speakers because it did not violate Align-AP, although it violated Align CF-ip,L, but now, given the shift in the ranking of constraints, it becomes a loser when compared to candidate (b). Finally, candidate (c) remains non-optimal because it violates Dep-T* through the insertion of a pitch accent on the lexically unaccented lagunen. This candidate respects Align-AP, unlike candidate (b), but does so at the expense of violating the highly ranked Dep-T*.

The difference in ranking between two constraints explains the descriptive observation presented in section 2 and summarized in Table 1: more restrictive speakers can only highlight a word in contrastive focus if it forms its own AP, whereas less restrictive speakers can highlight a word as long as it has an accent, even if it does not constitute an AP by itself. Because of the higher ranking of ALIGN-AP, for the more restrictive speakers it is more important to have well-formed APs than highlighting the word or inserting an ip boundary to its left. For the less restrictive speakers, on the other hand, it is more important to insert ip boundaries to the left of focused words than having well-formed APs. It is also more important not to insert pitch accents on words which are lexically unaccented and do not get a derived accent than to have well-formed APs (i.e., DEP-T* is ranked higher than ALIGN-AP).

Let us now turn our attention to the leftmost unaccented word in (16). As stated in situations (c) and (d) in Table 1, the leftmost unaccented word cannot be highlighted by speakers of NBB, whether they are more and less restrictive. This case is illustrated in (20).

(20) a. *Noren kuadernúa biar dosula? Lengusuéna?*
whose notebook-abs need aux cousin-gen
'Whose notebook (did you say that) you need? The cousin's?'

b. *Es, LAGUNEN liburúa biar dot.*
no FRIEND-gen book-abs need aux
'No, I need THE FRIEND'S book'.

The word *lagunen* has to be pronounced in the same AP with the following word, up to the pitch accent. Given the difference in the ranking of constraints seen above, the question is: how do the two types of speakers coincide in the

result? The simple answer is that the differently ranked constraints are not crucially involved in the decision. The tableau in (21) shows the way the more restrictive speakers select their choice, with the ranking established above.

(21) More restrictive speakers

$_{DP}$[$_{F}$(lagunen) 'liburua] biar dot	INF FOC	DEP-T*	ALIGN AP	ALIGN CF-IP,L	HIGH-LIGHT
☞ a. %L H- H*+L | | | $_{ip}$[$_{AP}$(**lagunen liburúa**)] biar dot					*
b. %L H- H*+L %L H- H*+L | | | | | | $_{ip}$[$_{AP}$(**lagunén**)] $_{ip}$[$_{AP}$(liburúa)] biar dot		*!			

Candidate (b) loses because it violates DEP-T* by displaying a pitch accent on the lexically unaccented *lagunen*. The winning candidate respects this constraint, at the expense of not highlighting the focalized word. Both candidates satisfy ALIGN-AP: (a) obeys it by having one AP that starts and ends correctly with %L H- and H*+L, respectively, and (b) obeys it because its two APs are equally well-formed. It is the insertion of the AP boundary after *lagunen* that implies the violation of DEP-T*, however. Finally, both candidates satisfy ALIGN CF-IP,L trivially, because the focalized word starts the utterance, and hence an ip as well. That is, there is no need to insert left-edge ip boundaries.

We have now found an explanation for the similar pattern observed for both types of speakers in LB. Since the only difference between the two types of speakers lies in the different relative ranking of ALIGN-AP and ALIGN CF-IP,L, and none of these two constraints is violated, the end result with less restrictive speakers will be the same as the one just seen above.[16] Let us now turn our attention to situations (a) and (b) in Table 1. Situation (b) is exemplified by sentence (15), repeated below.

(22) *Amáien alabiá topa dot.*
Amaia-gen daughter-abs find aux
'I have run across Amaia's daughter.'

For both types of speakers in LB, the two words can be intonationally highlighted if they are contrastively focalized. The same pattern obtains when the second word is lexically accented, as in situation (a). For instance, the second word in (15) can be focalized given a context such as (23).

(23)a. *Nor topa dosula Amaiéna? Semia?*
who find aux Amaia-gen son-abs
'Amaia's who have you run across? Her son?

b. *Es, Amáien ALABIÁ topa dot.*
no Amaia-gen DAUGHTER-abs find aux
'No, I have run across Amaia's DAUGHTER'.

The following tableau illustrates the way the more restrictive speakers select the observed output.

(24)More restrictive speakers

$_{DP}$['Amaien $_{F}$(alabia)] topa dot	INF FOC	DEP-T*	ALIGN AP	ALIGN CF-IP,L	HIGH-LIGHT
☞ a. %L H*+L %L H- H*+L | | | | | $_{ip}$[$_{AP}$(Amáien)] $_{ip}$[$_{AP}$(**alabiá**)] topa dot		*			
b. %L H*+L %L H- H*+L | | | | | $_{ip}$[$_{AP}$(Amáien) $_{AP}$(**alabiá**)] topa dot		*		*!	
c. %L H*+L H*+L | | | $_{ip}$[$_{AP}$(**Amáien alabiá**)] topa dot		*		*(!)	*(!)

The three candidates violate DEP-T*, as the lexically unaccented word *alabia* receives an accent because of its immediate preverbal position, that is, by obeying INFFOC. Candidate (a) assigns main prosodic prominence to this word, as signaled by the boldface (thus obeying HIGHLIGHT), and satisfies ALIGN CF-IP,L through the insertion of an ip boundary on the left edge of *alabiá*. Candidate (b) is eliminated because it highlights *alabiá* without inserting an ip boundary, thus violating ALIGN CF-IP,L. Candidate (c) represents an output in which the focalized word is not singled out, but pronounced in the same AP

with the preceding word. This candidate violates both HIGHLIGHT and ALIGN CF-IP,L. Given the free ranking of these two constraints, it is not possible to decide which of the two violations is fatal, so both are marked with (!). ALIGN-AP has no effect in this case because all candidates have the left and right edges of their APs well aligned with %L H- and H*+L, respectively. Thus, candidate (a) is the winning candidate.

Candidate (c) also violates a constraint that would force a H*+L pitch accent to be aligned with the right edge of an AP boundary, that is, the inverse of (14). More accurately, the constraint would demand that the right edge of a word bearing a pitch accent aligns with the right edge of an AP. But this constraint is not included here, for space limitations and because it would not play a decisive role. The same result obtains for the less restrictive speakers. ALIGN CF-IP,L eliminates candidates (b) and (c).

The last point in our analysis of the patterns of prominence assignment and intonational phrasing of contrastive focalization in NBB will be an illustration of the case in which the first word is contrastively focalized in a sentence such as (15).

(25)a. *Nóren alabia topa dosula? Mirenéna?*
whose daughter-abs find aux Miren-gen
'Whose daughter have you run across? Miren's?

b. *Es, AMÁIEN alabiá topa dot.*
no AMAIA-gen daughter-abs find aux
'No, I have run across AMAIA'S daughter'.

Again, both the more and the less restrictive speakers coincide in their selection of the optimal output: the first word does receive main prosodic prominence. The following tableau shows how this selection is produced for the more restrictive speakers.

(26)More restrictive speakers

$_{DP}$[$_{F}$('Amaien) alabia] topa dot	INF FOC	DEP-T*	ALIGN AP	ALIGN CF-IP,L	HIGH-LIGHT
☞ a. %L H*+L %L H- H*+L | | | | | $_{ip}$[$_{AP}$(**Amáien**) $_{AP}$(alabiá)] topa dot		*			

b. %L H*+L H*+L | | | $_{ip}[_{AP}$(**Amáien alabiá**)] topa dot		*		*!

In comparison with the tableau in (24), only two candidates are chosen for this illustration. This is because there is no relevance in whether the second word is left-aligned with an ip boundary, as it is the first word that is focalized. This competition is won by candidate (a), because it does not incur in any violation except for DEP-T*, due to the accent that the lexically unaccented *alabia* gets because of its immediate preverbal position, that is, by obeying INFFOC. Candidate (b) violates this constraint but also HIGHLIGHT, as the word *Amáien* is not singled out with the main prosodic prominence in the utterance but is pronounced in the same AP with the following word. This would be the only instance in which HIGHLIGHT would be effective (I want to thank the anonymous reviewer for bringing this issue to my attention). The only proviso would be that candidate (b) is the counterpart of candidate (c) in the previous tableau, and hence it would violate a constraint that would demand that the right edge of a word bearing a pitch accent aligns with the right edge of an AP (see also the discussion for candidate (c) in tableau (24)). If this constraint were ranked higher than HIGHLIGHT, then HIGHLIGHT would not be effective here either. Finally, both candidates satisfy ALIGN CF-IP,L vacuously, as the word *Amáien* starts the utterance and hence an ip as well. They also satisfy ALIGN-AP because the AP boundaries are well aligned with %L and H*+L.

In the grammar of the less restrictive speakers, the same situation is found. The change in the relative ranking of ALIGN CF-IP,L and ALIGN-AP does not lead to a different outcome.

4. Summary

In this paper we have described and analyzed patterns of realization of prosodic prominence in broad-focus and narrow-focus contexts in Lekeitio Basque, a variety of Northern Bizkaian Basque. One group of speakers, the 'more restrictive' speakers, can only single out focused words intonationally if they are accented and constitute APs by themselves, while another group, the 'less restrictive' speakers, can single out intonationally any word which is accented, regardless of whether it constitutes an AP by itself. Thus, lexically unaccented words which do not get a derived pitch accent (i.e., those that do not occur immediately preceding the verb) cannot be singled out, and are pronounced in the same AP with the following word. The impossibility of assign-

ing main prosodic prominence to a contrastively focalized word is an uncommon pattern crosslinguistically. Since restrictions and constraints are the core business of Optimality Theory, this is the analytical framework we used. The restrictions on the prosodic realization of focus were shown to derive from the interplay of five ranked constraints. DEP-T* is highly ranked, penalizing the insertion of accents that are not lexically specified, except on words that precede the verb, which must receive an accent by virtue of the higher-ranked INFFOC. Importantly, DEP-T* dominates HIGHLIGHT, the constraint that demands that contrastively focalized words are intonationally singled out. This ranking accounts for the impossibility of highlighting a lexically unaccented word which does not get a derived accent. This pattern holds for all speakers in LB, and it is explained by the low ranking of HIGHLIGHT, to the point of being almost ineffective (except for the cases shown in tableau (26)). The difference between the two types of speakers was explained as a difference in the ranking of two constraints. There is a (combined) constraint that enforces the alignment of the tonal sequence %L H- with the left edge of an AP, and of the right edge of a word with a pitch accent with the right edge of an AP, ALIGN-AP. There is also a constraint that requires the presence of an ip boundary at the left edge of the word bearing contrastive focus. More restrictive speakers rank ALIGN-AP higher than ALIGN CF-IP,L (cf. (27)), while less restrictive speakers have the opposite ranking (cf. (28)). This explains why in sentences with an unaccented word preceding a focalized word more restrictive speakers cannot single out the second word. The insertion of an ip boundary at the left edge of the focalized word requires a right-edge AP boundary at the right edge of the preceding unaccented word, and ALIGN-AP penalizes this unless a pitch accent is inserted. This is in turn penalized by DEP-T*. Less restrictive speakers, on the other hand, by having ALIGN-AP lower than ALIGN CF-IP,L, can insert AP boundaries freely at the right edge of the unaccented word, even without the presence of a pitch accent, to avoid violating DEP-T*. This makes it possible to insert an ip boundary on the left edge of the focused word.

(27) More restrictive speakers
INFFOC » DEP-T*, ALIGN-AP » ALIGN CF-IP,L, HIGHLIGHT

(28) Less restrictive speakers
INFFOC » DEP-T*, ALIGN CF-IP,L » ALIGN-AP, HIGHLIGHT

Notes

Section 2 of this article is a shortened version of section 3 in Elordieta (2006a), which offers a detailed description of the restrictions on the intonational realization of focalized constitu-

ents in Northern Bizkaian Basque. I am indebted to Matthew Gordon and José Ignacio Hualde for comments on earlier versions of this article, as well as to an anonymous reviewer for accurate comments and suggestions that have helped improve the paper. Last but not least, I want to thank my native informants, without whom this article would not exist. This work was partially funded by research grants from the Spanish Ministry of Science and Technology/FEDER (BFF2002-04238-C02-01) and the University of the Basque Country (UPV-EHU 9 UPV 00114.130-160.09-2004 U).

1. For a more detailed overview and references on the different strategies of focus realization, see section 2 in Elordieta (2006a).
2. The following abbreviations will be used in the article: abl = ablative, abs = absolutive, all = allative, aux = auxiliary, dat = dative, erg = ergative, gen = genitive, ines = inessive, loc = locative, pl = plural, sg = singular.
3. Jun and Elordieta (1997) found that in APs up to four syllables long the peak of H- is reached on the second syllable, and in APs more than fours syllables long it was reached on the third syllable. This H- is not phonetically realized when the second syllable is associated to a pitch accent (or, alternatively, it is not phonetically distinguishable from a H*+L pitch accent, as an anonymous reviewer reminds me).
4. Following ToBI transcribing traditions (Beckman and Ayers 1994), in all figures in this article tones are right-aligned with the syllables they are associated to rather than with the center of those syllables. That is, %L tones, H- tones and H*+L pitch accents are aligned with the right edge of the first syllable of an AP, the right edge of the second syllable in an AP, and the right edge of a penultimate or final syllable of an AP, respectively. This is especially important in the case of H*+L accents, as being aligned with the right edge may attract the attention to the L part of the contour tone. Through the sound wave, the reader may correct this impression inspecting visually the intonational contour in the syllable with the pitch accent.
5. It is possible for focalized constituents to appear after the verb, but they are usually uttered as separate intermediate or intonational phrases, preceded by pauses, fillers such as *e… err…um…*, or by final lengthening in the verb, which also ends in a rising intonation. Copulas can be followed by focalized constituents even without a pause (Hualde et al., 1994). In central and eastern dialects it is possible to have focalized elements postverbally without a pause (Hidalgo 1994; Elordieta 2003), but the speakers of those dialects that I have consulted cannot have postverbal focus as an answer to a wh-word. In that case preverbal focus is the only option. Perhaps only informational, non-contrastive focus (Kiss 1998) can appear postverbally in these dialects, but more research is needed before making any generalizations.
6. The delayed peaks at the end of prefocal words were already observed for some speakers of LB by Ito, Elordieta, and Hualde (2003). However, their data involved cases of corrective focus, which we also discuss below. The patterns presented in this paper show that it is possible to find such delayed peaks in non-corrective narrow focus as well. Interestingly, when there is peak delay in the previous word a bigger pitch level on the focalized word is not necessary. Other non-intonational strategies of main prominence that can be observed in these contexts are higher intensity and duration on the focalized word.
7. Indeed, the speakers of LB that Elordieta (1997, 2003) collected his data from did not produce utterances in which the second word was made the most prominent word into-

nationally, and this led to positing the absence of such a possibility. That conclusion must now be corrected to capture the facts presented in this article.

8. Although the results in Elordieta and Hualde (2001, 2003) showed that lengthening applied to words in corrective focus, it must be pointed out that in those utterances speakers were instructed to put special emphasis on those words. In other recordings in which speakers were not told to put emphasis on the correction, I have observed that lengthening did not occur significantly. It seems that a specific experiment is needed to clarify the role of lengthening as a cue of corrective focus, which we leave for future research.
9. In contexts in which the first unaccented word was contrastively focalized, in a few instances the less restrictive speakers produced contours in which this word was prosodically set apart, by having a higher pitch level followed by a fall in pitch for the following word, or by being pronounced with bigger intensity and duration. However, such cases were few in number, so at this point we consider it premature to conclude that highlighting the unaccented word in these contexts is a solid possibility in LB, and leave the issue open for further research with more speakers and more tokens of each type of context.
10. When the first syntactic phrase contains only one accented word, however, downstep is not blocked but applies onto the following syntactic phrase, as shown in Elordieta (1997, 1998). That is, no ip-boundary separates the two phrases. Elordieta (2001, 2006b) argues that a minimal size constraint holds of ips in LB, demanding that an ip must contain at least two APs (i.e., two words with a pitch accent). If a syntactic phrase contains only one accented word, the ip that this syntactic phrase would be mapped onto would not be well-formed, and and hence no ip boundary in inserted in these cases.
11. Based on the description of the main intonational patterns of LB in Elordieta (1997, 1998), Gussenhoven (2004: 180–182) provides a brief account in OT terms. However, the constraints he presents formalize more general properties of NBB, such as the alignment of ips with syntactic maximal projections, the alignment of broad and corrective focus, not the restrictions on the individual intonational prominence of focalized words. However, I will refer to the constraints in Gussenhoven (2004) where relevant.
12. This constraint has been proposed independently by Selkirk (2000) for English as DEP (Accent).
13. Gussenhoven (2004: 180) offers a different formulation. A possible objection against referring to the derived accent before the verb as information focus would be that such an accent is present even in cases in which another word or constituent is narrowly focalized. A possible alternative could be to interpret the assignment of a pitch accent to preverbal words as sentence stress, which has already been suggested to exist independently of focus in languages that have a syntactic position for focus (Tamburri-Watt 2001).
14. In Wolof, morphological markers serve to cue focus, without any prosodic effects (Rialland and Roberts 2001). In this language, HIGHLIGHT would be lowly ranked.
15. Unaccented words at the end of IPs which do not contain the nuclear or most prominent accent in the utterance do not receive a pitch accent (e.g., at the end of utterances, topic phrases, subordinate clauses, or parentheticals). Assuming that the right edge of an IP is aligned with the right edge of lower constituents such as an AP, in those cases the right edges of the APs in question would not be aligned with words with pitch accents. Thus,

the correct formulation of an AP must be extended to include these cases. For the sake of simplicity, however, I will not refer to this extension in the formulation of the constraint.

16. As for why there are only two competing candidates, the reason is that the only way to have prosodic prominence in NBB is by having a pitch accent, so there cannot be a candidate that highlights *lagunen* without a pitch accent, as in (i):

(i)

```
                %L  H-        %L H- H*+L
                 |  |          |  |  |
ip[AP(lagunen)] ip[AP(liburúa)]  biar dot
```

Phonetically, this candidate is like candidate (b) in (21). Highlighting *lagunen* through the combination of the phrasal H- and a pitch fall at the boundary of the two words amounts to having a pitch accent on *lagunen*. This is why such a candidate is not considered here.

References

Arregi, Karlos

2002 Focus and word order in Basque. Ph. D. diss., Massachusetts Institute of Technology.

Beckman, Mary, and Gayle Ayers

1994 ToBI annotation conventions. Manuscript. Ohio State University.

Beckman, Mary, and Janet Pierrehumbert

1986 Intonational structure in English and Japanese. *Phonology Yearbook* 3: 255–309.

Elordieta, Arantzazu

2001 *Verb Movement and Constituent Permutation in Basque*. Utrecht: LOT.

Elordieta, Gorka

1997 Accent, tone and intonation in Lekeitio Basque. In *Issues in the Phonology and Morphology of the Major Iberian Languages*, Fernando Martínez-Gil, and Alfonso Morales-Front (eds.), 4–78. Washington, DC: Georgetown University Press.

1998 Intonation in a pitch-accent dialect of Basque. *International Journal of Basque Linguistics and Philology* 32: 511–569.

2001 "Binarity constraints on Intermediate Phrases". Paper presented at the *Workshop on Prosody in Processing*, Utrecht University, July 5–6, 2001.

2003 Intonation. In *A Grammar of Basque,* José I. Hualde, and Jon Ortiz de Urbina (eds.), 72–113. Berlin: Mouton de Gruyter.

2006a Constraints on intonational prominence of focalized constituents. In *Topic and Focus: Meaning and Intonation from a Cross-Linguistic Perspective,* Chungmin Lee, Matthew Gordon, and Daniel Büring (eds.), 1–22. Dordrecht: Springer.

2006b "Binarity at the left edge of Intonational Phrases". Paper presented at the *GLOW Workshop on Prosodic Processing*, Universitat Autònoma de Barcelona, April 5, 2006.

Elordieta, Gorka, and José I. Hualde

2001 The role of duration as a correlate of accent in Lekeitio Basque. In *Proceedings of Eurospeech 2001 – Scandinavia*, 105–108.

Elordieta, Gorka, and José I. Hualde

2003 Tonal and durational correlates of accent in contexts of downstep in Northern Bizkaian Basque. *Journal of the International Phonetic Association* 33: 195–209.

Elordieta, Gorka, Iñaki Gaminde, Inma Hernáez, Jasone Salaberria, and Igor Martin de Vidales

1999 Another step in the modeling of Basque intonation: Bermeo. In *Text, Speech and Dialogue,* Václav Matoušek, Pavel Mautner, Jana Ocelíková, and Petr Sojka (eds.), 361–364. Berlin: Springer-Verlag.

Etxepare, Ricardo, and Jon Ortiz de Urbina

2003 Focalization. In *A Grammar of Basque,* José I. Hualde, and Jon Ortiz de Urbina (eds.), 459–515. Berlin: Mouton de Gruyter.

Gussenhoven, Carlos

2004 *The Phonology of Tone and Intonation.* Cambridge: Cambridge University Press.

Halle, Morris, and Jean-Roger Vergnaud

1987 *An Essay on Stress.* Cambridge, Mass.: MIT Press.

Haraguchi, Shosuke

1991 *A Theory of Stress and Accent.* Dordrecht: Foris.

Hidalgo, Bittor

1994 *Hitz ordenaren estatistikak euskaraz.* [Word order statistics in Basque.] Ph. D. diss., University of the Basque Country.

Hualde, José I.

1997 *Euskararen Azentuerak* [Basque accentuation]. Bilbao: Servicio Editorial de la Universidad del País Vasco.

1999 Basque accentuation. In *Word Prosodic Systems in the Languages of Europe,* Harry van der Hulst (ed.), 947–993. Berlin: Mouton de Gruyter.

2000 On system–driven sound change: Accent shift in Markina Basque. *Lingua* 110: 99–129.

Hualde, José I., Gorka Elordieta, and Arantzazu Elordieta

1994 *The Basque Dialect of Lekeitio.* Bilbao/San Sebastián: Servicio Editorial de la Universidad del País Vasco.

Hualde, José I., Gorka Elordieta, Iñaki Gaminde, and Rajka Smiljanić

2002 From pitch-accent to stress-accent in Basque. In *Laboratory Phonology 7,* Carlos Gussenhoven, and Natasha Warner (eds.), 547–584. Berlin: Mouton de Gruyter.

Ito, Kiwako, Gorka Elordieta, and José I. Hualde

2003 Peak alignment and intonational change in Basque. In *Proceedings of the 15th International Congress of Phonetic Sciences*, María-Josep Solé, Daniel Recasens, and Joaquín Romero (eds.), 2929–2932.

Jackendoff, Ray
1972 *Semantic Interpretation in Generative Grammar*, V*olume 2*. Cambridge, Mass.: MIT Press.
Jun, Sun-Ah, and Gorka Elordieta
1997 Intonational structure of Lekeitio Basque. In *Intonation: Theory, Models and Applications,* Antonis Botinis, Giorgios Kouroupetroglou, and George Carayiannis (eds.), 193–196. European Speech Communication Association: Athens.
Kager, René
1999 *Optimality Theory.* Cambridge: Cambridge University Press.
Kiss, Katalin E.
1998 Identificational focus versus information focus. *Language* 74: 245–273.
Kubozono, Haruo
1993 *The Organization of Japanese Prosody.* Tokyo: Kurosio.
Nespor, Marina, and Irene Vogel
1986 *Prosodic Phonology.* Dordrecht: Foris.
Ortiz de Urbina, Jon
1989 *Parameters in the Grammar of Basque.* Dordrecht: Foris.
1999 Focus in Basque. In *The Grammar of Focus,* Georges Rebuschi, and Laurie Tuller (eds.), 311–333. Amsterdam and Philadelphia: John Benjamins.
Pierrehumbert, Janet, and Mary Beckman
1988 *Japanese Tone Structure.* Cambridge, Mass.: MIT Press.
Poser, William
1984 *The phonetics and phonology of tone and intonation in Japanese.* Ph. D. diss., Massachusetts Institute of Technology.
Prince, Alan, and Paul Smolensky
1993 *Optimality Theory: Constraint Interaction in Generative Grammar.* Oxford. Blackwell.
Rialland, Annie, and Stéphanie Robert
2001 The Intonational system of Wolof. *Linguistics* 39: 893–939.
Sekirk, Elisabeth
1986 On derived domains in sentence phonology. *Phonology Yearbook* 3: 371–405.
2000 The interaction of constraints on prosodic phrasing. In *Prosody: Theory and Experiment,* Merle Horne (ed.), 231–261. Dordrecht: Kluwer Academic Publishers.
1984 *Phonology and Syntax: The Relation between Sound and Structure.* Cambridge, Mass.: MIT Press.
1995 The prosodic structure of function words. In *Papers in Optimality Theory. University of Massachusetts Occasional Papers in Linguistics 18,* Jill Beckman, Laura Walsh-Dickey, and Suzanne Urbanczyk (eds.), 439–469. Amherst, Mass.: GLSA.
2000 The interaction of constraints on prosodic phrasing. In *Prosody: Theory and Experiment,* Merle Horne (ed.), 231–261. Dordrecht: Kluwer Academic Publishers.

Selkirk, Elisabeth, and Koichi Tateishi

1991 Syntax and downstep in Japanese. In *Interdisciplinary Approaches to Language: Essays in Honor of S.-Y. Kuroda,* Carol Georgopoulos, and Roberta Ishihara (eds.), 519–543. Dordrecht: Kluwer.

Tamburri-Watt, Linda

2001 "Prosody and focus in Squamish Salish". Paper presented at *Topic and Focus: a Workshop on Intonation and Meaning* July 20–21, 2001, University of California, Santa Barbara.

Truckenbrodt, Hubert

1995 Phonological phrases: Their relation to syntax, focus, and prominence. Ph. D. diss., Massachusetts Institute of Technology.

1999 On the relation between phonological phrases and syntactic phrases. *Linguistic Inquiry* 30: 219–255.