Absolute Questions Do Not Always Have a Rising Pattern: Evidence from Bilbao Spanish

Sergio Robles-Puente
University of Southern California

1. Introduction

Previous research on Spanish intonation has paid attention to the different pragmatic meanings associated with various pitch contours. Of particular interest to both phoneticians and phonologists has been the role intonation plays in disambiguating declarative and interrogative utterances. In Spanish two basic kinds of questions can be distinguished: pronominal questions and absolute questions (aka yes/no questions). One of the most interesting characteristics of absolute questions in Spanish is that intonation may be the only indicator that makes these questions different from statements (Hualde 2005). Consequently, utterances like *Vive en Bilbao* (He lives in Bilbao) and *¿Vive en Bilbao?* (Does he live in Bilbao?) are different perceptually speaking only due to intonation. The description of utterances like the second one in terms of pitch movements in Spanish has been quite uniform. Navarro Tomás (1974) states that the pitch at the end of the sentence in an absolute question always rises. Similarly, Quilis (1987, 1988) identifies a rising terminal juncture (boundary tone) preceded by a medium tone level. Sosa (1999) argues that there is H% in all the Peninsular varieties, Argentinian Spanish and Mexican Spanish. Hualde (2005) posits that in most Spanish dialects absolute questions have a final rise (H%) from a low point on the last stressed syllable. Finally, more recent work by Prieto and Roseano (2010), confirms these observations by stating that the final rising movement is also characteristic of Cantabrian Spanish (López-Bobo and Cuevas-Alonso 2010), Venezuelan Andean Spanish (Astruc *et al.* 2010), and Chilean Spanish (Ortiz *et al.* 2010) among others.

Considering these statements it can be concluded that many Spanish dialects show a rising pattern to indicate that the utterance is an absolute question. Nevertheless, Garrido (1996) declares that in Spanish almost any kind of tonal pattern can appear in any kind of sentence and therefore falling patterns can be used in these sentences as well. In fact, Quilis (1987) highlights that in the Spanish of Puerto Rico and Las Palmas de Gran Canaria (Spain), absolute questions present a circumflex contour (i.e. nuclear accent higher than preceding accents). Sosa (1999) finds circumflex patterns in Caribbean Spanish too, more concretely in Caracas, Cuba and Puerto Rico. As Hualde (2005) indicates, in these varieties circumflex contours are not pragmatically marked; in contrast, in other varieties they are marked and they can be used as information checks. In addition, Hualde (2005) also cites Asturian and Galician Spanish in northwestern Spain as dialects presenting this kind of pattern.[1]

The current work presents findings from an instrumental study of Bilbao Spanish (BS), an understudied variety spoken in Northern Spain, which demonstrates that low boundary tones can also be widely used in Spanish absolute interrogatives. The pattern clearly differs from the one found in other Peninsular varieties like Madrid Spanish. Interestingly, the F0 contours produced by Bilbao Spanish speakers also differ from the ones attested in other varieties that make use of low boundary

[1] Sosa (1999) notes that Cunningham (1983) found a falling pattern in absolute questions in the area too.

tones due to different pitch movements and peak alignments. The relevance of these characteristics is brought forward by perceptual data as well.

2. Production experiment

2.1. Subjects and Data collection

Five male speakers and a female speaker from the Bilbao area (Basque Country, Spain) were selected to take part in the production component of the study. The female speaker (OM) and one of the male speakers (KA) were fluent Spanish-Basque bilinguals, three other speakers (IR, IA, SR) considered themselves passive bilinguals (i.e. although they can speak Basque, they normally speak Spanish) and only one speaker (JC) considered himself a Spanish monolingual.[2] A male speaker from Madrid and a female from Puerto Rico were included as controls. The speaker from Puerto Rico and two of the Bilbao Spanish speakers (OM, KA) were recorded at the University of Illinois at Urbana Champaign while the Madrid Spanish speaker was recorded in Madrid. The rest of the participants were recorded in Bilbao. All the participants were between 22 and 35 years old and were asked to take part in a task in which they had to determine about whom another person (the experimenter) was thinking by asking absolute questions. The subjects were presented with twelve persons with different characteristics, and had to ask about specific characteristics to identify one person. The reason to collect data in this way was two-fold. First, this method assured that productions were natural and (semi)spontaneous. Face (2003) finds differences in the pitch of Spanish declarative utterances comparing lab speech (normally scripted) and spontaneous speech. By collecting data in this way, more natural productions were expected. Moreover, Spanish speakers are taught the standard intonation in school when it comes to reading absolute questions (i.e. L* HH%) to distinguish them from declaratives, so asking them to read questions would probably not have shown the actual pattern these speakers use when they speak. Second, it was important to obtain the same kinds of sentences and therefore comparable data between and within dialectal groups. The number of utterances obtained from each speaker varied due to the different questions asked during the guessing game; nevertheless, the amount of data can be considered sufficient and representative enough to be analyzed and to give observations.[3] The first two sets of questions (10-12 utterances) were not considered in order to avoid possible discomfort and therefore unnatural utterances at the beginning of the experiment. Questions that were not absolute questions and declarative sentences were excluded. Utterances that presented creaky voice or interruptions or an absence of pitch movements due to a low pitch range were excluded too. This gives a total of 854 absolute questions (68 for Madrid Spanish, 38 for Puerto Rican Spanish and 746 for Bilbao Spanish). The Praat speech analysis program (Boersma and Weenink, 2009) was used to analyze the pitch of the utterances.[4]

2.2. Results-Production

First the absolute question patterns of the two varieties that have already been described in the literature (i.e. Madrid Spanish - henceforth MS - and Puerto Rican Spanish - henceforth PRS) will be briefly presented. Afterwards, they will be compared to Bilbao Spanish (henceforth BS) and quantitative data will be provided.

2.2.1. Absolute questions in Madrid Spanish and Puerto Rican Spanish

As Figure 1 shows, the MS dialect, considered to be representative of a standard variety in Spain, presents a final raising pattern in absolute questions as already pointed out by Sosa (1999), Hualde

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[2] According to Cenoz (2005) 24.7% of the inhabitants in the Basque Country are bilingual (Spanish/Basque) and 16.3% passive bilingual. Speakers with different language backgrounds were included in the study since they may produce absolute questions with different intonational patterns.

[3] Interestingly, absolute questions were also obtained outside the guessing game for two of the Bilbao speakers and they showed the same patterns as the ones obtained during the experiment.

[4] Voiceless consonants were avoided as much as possible to prevent pitch contour interruptions. However, in some utterances the appearance of certain consonants provoked small dips in the pitch contour that must not be taken into account.

(2005) and Estebas-Vilaplana and Prieto (2010) among others. All 68 sentences in MS show similar patterns to the one presented in Figure 1, where the nuclear accent (BUEno) is low (L*) and is followed by a final rise (HH%).[5] Following Sosa (1999), this description is valid for other Peninsular varieties too. However, it clearly contrasts with PRS as it can be seen by comparing Figure 1 and Figure 2. In PRS the nuclear accent is high, shows upstep (¡H*) and is followed by a falling boundary tone (L%). This pattern was found in the rest of the Puerto Rican utterances too and is also confirmed by Armstrong (2010). It is clear that MS and PRS differ significantly when it comes to the production of absolute questions. Although BS is a Peninsular variety like MS, it does not show a final rising pattern but a falling one like in PRS. Nevertheless, both falling patterns are still different as demonstrated in the following section.
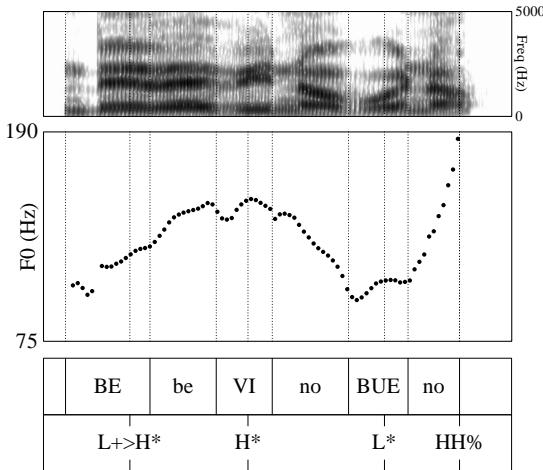

Figure 1: *¿Bebe vino bueno?*
"Does (s)he drink good wine?"
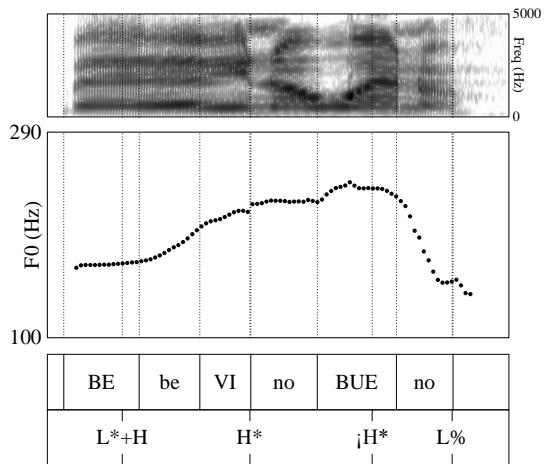Broad focus absolute question
Speaker AEV - Madrid Spanish

Figure 2: *¿Bebe vino bueno?*
"Does (s)he drink good wine?"
Broad focus absolute question
Speaker CM - Puerto Rican Spanish

2.2.2. Absolute questions in Bilbao Spanish

Figure 3 shows what pitch movements in an absolute question in BS look like. Similar to PRS, there is a circumflex contour; however, as it has been claimed, the two varieties differ in some aspects. These differences can be noted by comparing Figure 2 and Figure 3.
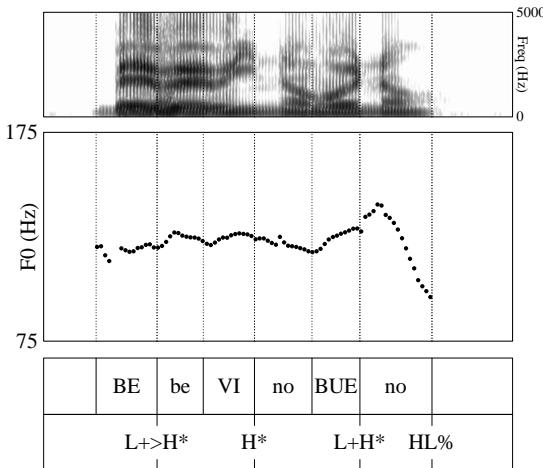

Figure 3: *¿Bebe vino bueno?*
"Does (s)he drink good wine?"
Speaker IR - absolute question in BS

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[5] I follow Estebas-Vilaplana and Prieto (2010) and mark the boundary tone as bitonal (and not H%) due to the final sharp rise.

In BS the nuclear accent is rising; however, the peak is reached in the next syllable and contrary to MS there is a clear final fall. As shown in Figure 2 the PRS variety presents what Sosa (1999) calls *'suspensión de declinación'* (declination suspension). Contrary to BS the pitch rises from the first content word and remains high until the end of the utterance where there is a final fall due to a low boundary tone (L%). In BS (Figure 3) the pitch starts rising in the stressed syllable of the last content word but the rise does not end there due to the H found in a complex HL%. This happens no matter the length or the kind of syntactic constituents that are found at the end of the utterance as shown in Figure 4 and Figure 5:
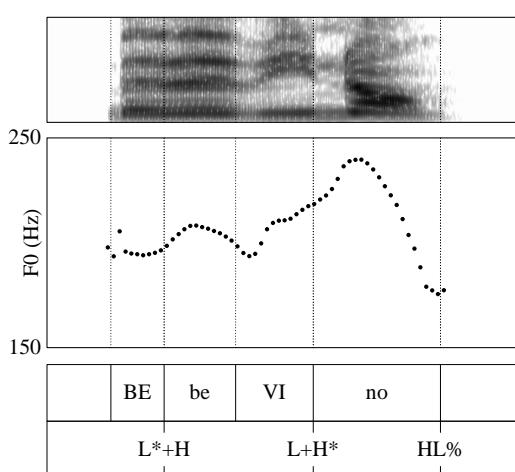

Figure 4: *¿Bebe vino?*
"Does (s)he drink wine?"
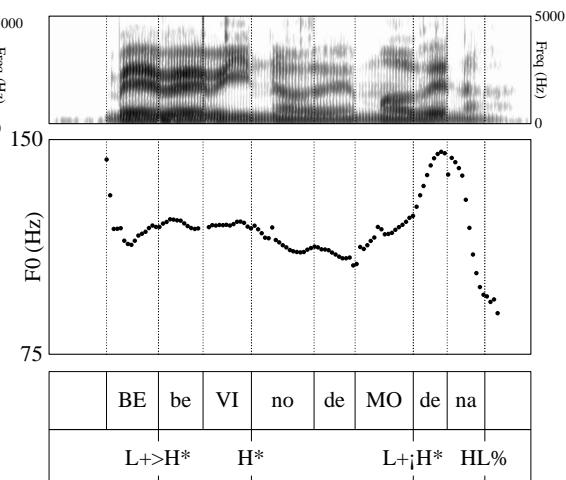Speaker OM – absolute question in BS

Figure 5: *¿Bebe vino de Módena?*
"Does (s)he drink wine from Modena?"
Speaker JC– absolute question in BS

Similar descriptions of nuclear configurations in various kinds of yes/no questions have been provided for Argentinian Spanish (Gabriel *et al.* 2010), Cantabrian Spanish (López-Bobo and Cuevas-Alonso 2010) or Castilian Spanish (Estebas-Vilaplana and Prieto 2010) and have been analyzed as L+H* HL% or L+¡H* HL%. Absolute questions ending in proparoxytone words demonstrate that these labels are also adequate to describe BS.[6] In Figure 5 the pitch starts rising in the stressed syllable 'MO-' and it remains high through-out the following syllable '-de-' due to the H in the bitonal boundary tone (HL%). Finally there is a fall due to the L tone. The F0 peak was notably high in some productions (e.g. Figure 5 - L+¡H* HL%); however there was variation even within speakers and in some cases it was not upstepped (Figure 3 - L+H* HL%). Thus, it seems that both patterns are used productively to convey the same meaning. Interestingly, when absolute questions in BS end in oxytone words with a final CVC sequence, the L tone of the complex HL% is still realized (e.g. alemán – German). This does not happen with oxytones ending in CV since the pitch does not lower presumably due to truncation (see Gabriel *et al.* 2010 for the same phenomenon in Argentinian Spanish).

It is worth mentioning that various kinds of pre-nuclear pitch-accents were found. The most numerous one was L+>H* (e.g. BEbe in Figure 5), also common in pre-nuclear pitch-accents in declarative sentences. Nevertheless, H* (e.g. VIno in Figure 5) or L*+H (e.g. BEbe in Figure 4) were also found in various sentences produced by different speakers. Moreover, in some cases, pre-nuclear stressed syllables were not accented or showed pitch rises of less than 5Hz. Although it could be argued that the length of the sentences may have played a role, the lack of accentuation did not happen in either MS or PRS. This suggests that the lack of accentuation in the first part of the sentence is

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[6] In previous versions of this paper the bitonal HL% was not used because absolute questions ending in paroxytone words did not seem to support the analysis. However, those words were verbs with clitics (e.g. dándomelo – giving it to me). A posterior analysis with paroxytone nouns revealed that the use of HL% is in fact possible.

probably an option in the realization of BS absolute questions.[7] Sosa (1999), following Canellada and Madsen (1987), states that the importance of the height of the initial part of Spanish interrogatives is "incontrovertible." Considering our data, PRS and MS exemplify the idea, but BS seems to challenge it. Lack of accentuation or variation in the pre-nuclear pitch accents in BS would be possible because perceptually speaking what matters is a rise in the last stressed syllable and a final fall. This idea is in line with Garrido (1996), who concludes that the most important intonational cue to distinguish sentence types in Spanish is final movements. Even so, it is important to highlight, that this cue may be only significant to speakers who share the phonological system in question. Other Peninsular varieties like MS show circumflex absolute questions only to verify information as noted by Quilis (1993), while in the rest of the cases a rising pattern is used. This means, as Hualde (2005) suggests, that varieties of the same language can share the same pattern for the same kinds of utterances but have two different pragmatic meanings. This is not the case for declarative sentences though.

The declarative utterance in BS shows the standard declining pattern of Spanish broad focus declarative sentences as shown in Figure 6.[8] There is a pre-nuclear accent (VUEla) with a L+>H* configuration and a nuclear accent (BadaLOna) with a L+H* one. There is also a substantial progressive lowering of the pitch range. The symbol (!) is used to mark the downstep. The boundary tone is low (L%). It can be observed that there are no remarkable differences between the pre-nuclear pitch-accents of the declarative utterance and the absolute question. They present a L+>H* pattern and the pitch height is the same; however, the pitch of the declarative utterance lowers while the pitch of the absolute question remains suspended (clear in 'ba-' and clearer in '-da-') until the stressed syllable of the last content word is reached. At this point, it rises reaching the peak in the post-tonic syllable to finally descend due to a low boundary tone.
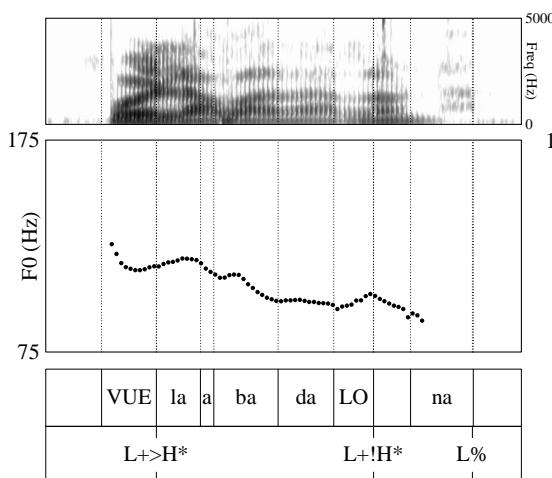

Figure 6: *Vuela a Badalona*
"(S)he flies to Badalona"
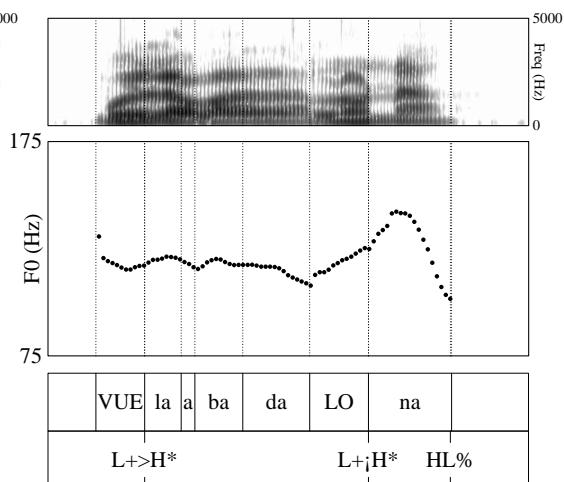Speaker IR - Declarative sentence

Figure 7: *¿Vuela a Badalona?*
"Does (s)he fly to Badalona?"
Speaker IR - Absolute question

Therefore, declarative sentences and absolute questions in BS seem to contrast at least in two ways. First, the pitch progressively lowers in declaratives (downstep) but it doesn't in absolute questions (which can show upstep as discussed before). Second, the alignment of the peak in the nuclear syllable is different in that declaratives show a clear L+H* pattern and in absolute questions the peak is reached out of the boundaries of the nuclear syllable due to the H in the bitonal HL boundary tone. The following discussion develops in more detail the importance of such patterns in absolute interrogatives for this variety.

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[7] Although there is nothing unique about speaker IA, he presents multiple cases of unaccented pre-nuclear syllables. The rest of the speakers only produced sporadic examples.

[8] Declarative utterances were obtained by asking speakers *¿qué pasa?* "What is happening?" These were not analyzed in detail since they are not the focus of the present paper and were only used for comparative purposes.

At first sight the configuration of the nuclear pitch-accent for all the BS speakers can be analyzed as L+H* HL%. To confirm this observation, thirty utterances of each speaker (6 speakers x 30 utterances = 180) containing paroxytones words at the end and a final CVCV structure were selected at random to calculate the actual position of the peak.[9] This was calculated as a percentage considering the total duration of that syllable i) to make the measurements of all participants comparable and ii) to have reference points for the perception experiment. The results are presented in Figure 8:
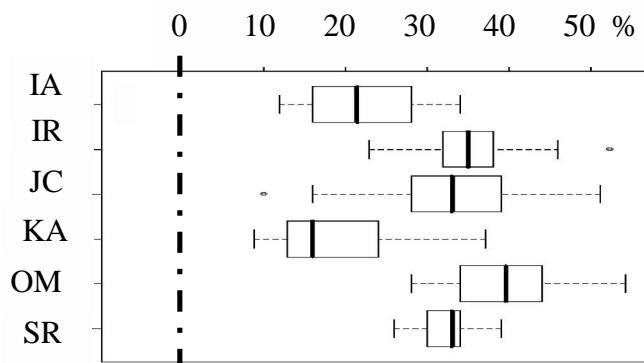

Figure 8: Position (%) of the F0 peak with respect to the nuclear accented syllable (0 = onset of the post-tonic syllable)

Independently from their language background, all BS speakers produced similar utterances. The F0 started rising in the accented nuclear syllable and the boundary tones were L%. As it has been mentioned before, M% or H% were not produced except in absolute questions ending in oxytone words with CV sequences in the last syllable due to truncation. Also, as Figure 8 reveals, F0 peaks were consistently found in the post-tonic syllable; however, although most of the peaks were located between the 20% and 40% of this syllable, the exact positioning varied. This raises some questions: Where are the limits to modify the position of the peak and still consider utterances natural absolute questions in BS? Would earlier peaks (i.e. peaks in the nuclear syllable) be perceived as natural by BS speakers too? A perceptual experiment was carried out in order to answer these questions.

3. Perception Experiment
3.1. Experiment and hypotheses

In previous sections it has been argued that BS speakers in absolute questions systematically show a final rising-falling pattern (circumflex) encountering a pitch rise in the stressed nuclear syllable but finding a delayed peak in the post-tonic due to a complex HL%. The peak alignment in all the utterances seems to be consistent so it is expected that speakers would recognize peaks within what can be considered a normal range (20%-40% of the post-nuclear syllable considering the production experiment) as natural and other peaks as less natural. In order to test this hypothesis, two sentences ending in paroxytone words that had final CV sequences were manipulated with the Praat speech analysis program (Boersma and Weenink, 2009).[10]

The manipulation consisted of two parts. One pertained to the peak position and the second to the height of the boundary tone. The rest of the two sentences remained unmodified. After manipulation there were nine different peak positions: 70, 80 and 90% of the nuclear syllable and 0 (offset of the accented nuclear syllable = onset of the post-tonic syllable), 10, 20, 30, 40 and 50% of the post-tonic syllable.[11] Apart from the nine peak positions, four different boundary tone heights were created as

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[9] This study concentrates on utterances ending in paroxytone words i) because a basic description of the pattern in BS is necessary and ii) because paroxytone words are much more common in Spanish.

[10] Synthesized sentences were modifications of absolute questions produced by the researcher. Prior to modification these were compared to other speakers' productions to verify that they had the same characteristics. The Ls were 123 Hz and the Hs 159 Hz. Although the values were slightly higher than the averages of the 6 male speakers in the production part (110 Hz and 145 Hz), the difference between L and H was almost identical.

[11] Further positions were not added because the sudden pitch drop between the peak and the boundary tone sounded artificial.

well: Height1 (height of the valley L), Height2 (Height1+25% of the difference between the peak H and the valley L), Height3 (Height1+50% of the difference between H and L) and Height4 (Height1+75% of the difference between H and L).[12] Representations of both manipulations can be seen in Figure 9 and Figure 10:
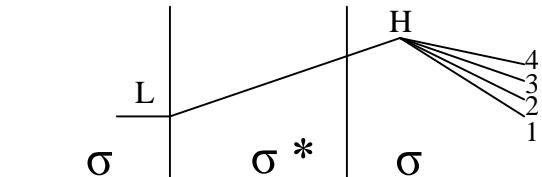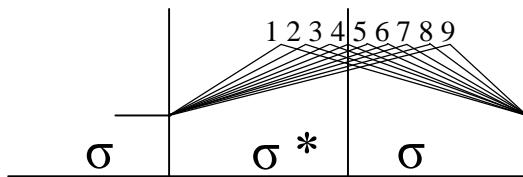

Figure 9: Peak positions after manipulation   **Figure 10:** Boundary tone heights after manipulation

All the possible combinations of peak positions and boundary tone heights yielded thirty-six different stimuli for each of the sentences (seventy-two total). Each stimulus was presented twice so each participant had to grade a total of one hundred and forty-four stimuli (two sentences X nine peak positions X four boundary tone heights X two repetitions). Stimuli were presented at random to minimize the effects of stimulus order within and among speakers. Five of the subjects that were recorded in the production part of the study (one female and four males) and another eight subjects (three females and five males) took part in the perception experiment. Three of the females and three of the males were Spanish/Basque bilinguals, four males were passive bilinguals and the other female and two males were Spanish monolinguals. All of them were between 22 and 29 years of age and were asked if the questions they were listening to sounded natural or unnatural to them in a given context. The naturalness or unnaturalness was graded in a scale that went from NO (no = unnatural) to SI (yes = natural) having seven other possible grades in between. The scale is presented in Figure 11:[13]

Quieres saber si tu amigo vuela a Badalona	*(You want to know if your friend is flying to Badalona)*
¿Consideras la pregunta que oyes natural?	*(Does this question sound natural to you?)*
NO 2 3 4 5 6 7 8 SI	*NO 2 3 4 5 6 7 8 YES*

Figure 11: Acceptability scale used in the perception component of the study

According to production results, peaks are normally found between the 20% and the 40% of post-nuclear syllable due to the high tone in the HL%. Consequently, it can be hypothesized that utterances bearing the peak in those positions will be considered more acceptable than others. Positions 5 and 9 (10% and 50% of the post-tonic syllable respectively) should still be perceived as natural since they are in the post-tonic syllable, but maybe not as natural as the rest. Finally, sentences with peaks found before the post-tonic syllable (1-4) should receive worse grades since the alignment of the peak was different from the one found in the production part. Concerning the boundary tone height it is expected that the lowest position (1) will be considered more natural than the other three (2,3,4) since in the production part of the experiment boundary tones had similar F0 values to L or slightly below the frequency where pitch started rising in the accented nuclear syllable.

3.2. Results-Perception

Figure 12 shows the average scores (and standard errors) for each of the 36 stimuli.[14] A two-way ANOVA found a main effect of peak position $F_{(8,11)} = 27.303$, $p \leq .001$. There was also a main effect of the height of the boundary tone, $F_{(3,11)} = 30.543$, $p \leq .001$. Finally, there was an interaction between the peak position and the height of the boundary tone, $F_{(24, 11)} = 2.771$, $p \leq .001$.

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[12] The lowest boundary tone height (1) was the same as L since positions below this point had creaky voice and were perceptually undistinguishable.

[13] The two subjects that participated in the pilot study observed that a five and a seven point scale were more difficult to use than a nine point scale.

[14] Averages were taken of the all the scores given by all the participants.

Note that stimulus 81 got the highest acceptability, meaning that peak position 8 and boundary tone height 1 were preferred over any other combination. This can be seen more clearly in Figures 13 and 14, which show the acceptability means (and standard errors) of the responses for the two dimensions separately.
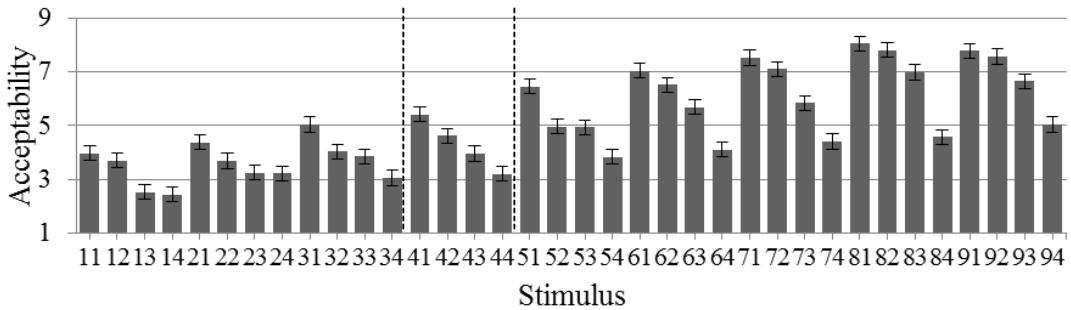

Figure 12: Stimuli acceptability (means) - The first number indicates the peak position and the second one the boundary tone height (e.g. Stimulus 41 = peak position 4 - 90% of the nuclear syllable - and a boundary tone of height 1). The dotted lines mark the boundary between tonic and post-tonic syllables.
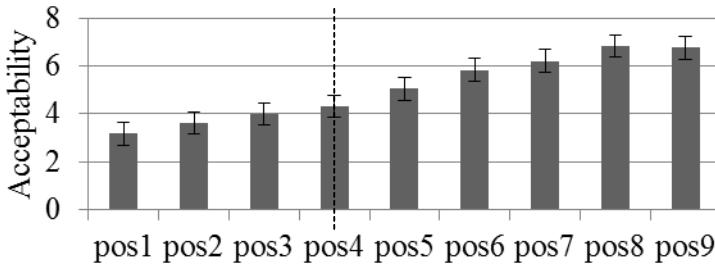

Figure 13: Peak position acceptability (means) - The dotted line marks the boundary between tonic and post-tonic syllables.
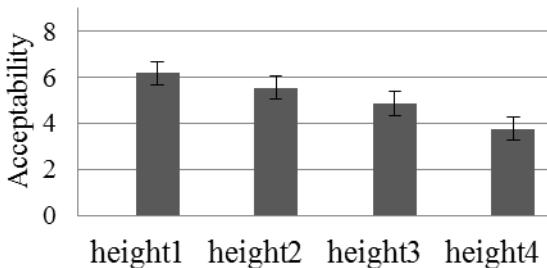

Figure 14: Boundary height acceptability (means)

By looking at Figures 12 and 13 it can be said that there is a preference for peaks found in the post-tonic syllable with position 8 (40% of the post-tonic syllable) as the best one. Interestingly, although peaks at the 50% of the post-nuclear syllable (peak position 9) are only found in two of the subjects in the production part, they are still considered natural. In contrast, peaks found in the nuclear syllable always receive much lower scores. In fact, a post hoc test revealed significant differences ($p \leq .001$) between peak position number 8 and the rest of peak positions, except for number 9. This means that although the nuclear vs. post-nuclear syllable location is relevant, the exact location of the peak within the post-nuclear syllable is important too. This can be related to factors like speech rate, the syllable structure or the number of unstressed syllables following the stressed syllable as pointed out by Steele (1986) for nuclear H* accents in English, Silverman and Pierrehumbert (1990) for pre-nuclear H* accents in English or Prieto and Torreira (2007) for LH* pre-nuclear peaks in Spanish. Thus, as a follow-up study, it would be interesting to see how BS speakers produce absolute questions at different speech rates and where the peaks are exactly located when questions end in paroxytone words or oxytone words with different syllable structures. It would also be necessary to conduct a

perceptual experiment where those variables remain unmodified but peak alignments are manipulated similarly to the current study to see the perceptual consequences.

As important as the late realization of the peak is the low tone in the complex HL%. Figure 14 shows that lower boundary tones are considered more natural than higher ones, with 1 as the best rated and 4 as the worst rated. A post hoc test confirmed that the scores of the lowest boundary tone were significantly different from the rest ($p \leq .001$). This suggests the relevance of low boundary tones too (vs. M% or H%) in the production of absolute questions.

Although the number of subjects for both the production and perception could be said to be small, the similarities found in both parts of the experiment should suffice to support the description of BS in terms of production of absolute questions. All BS speakers, independently of their sex, age or language background produced a circumflex pattern with a rising of pitch starting at the onset of the accented nuclear syllable, a post-nuclear peak and a low boundary tone. These three features that can be said to be characteristic of this Peninsular variety of Spanish.

4. Conclusions and further research

The present study makes an original contribution to the field of Spanish intonation in describing an understudied variety of Spanish and contrasting the findings with perceptual data. Garcia Riverón (1985), Sosa (1999) and Revert Sanz (2001) express the necessity to compare different dialects of Spanish starting from a specific pragmatic function and comparing possible different intonations when expressing it. In this study, I have described the intonational pattern of absolute questions shown by Spanish speakers in Bilbao (BS) and compared it to the one presented by the Spanish dialect of Madrid (MS) and the one of Puerto Rico (PRS). The Spanish dialect of Bilbao shows a rising-falling (circumflex) pattern, similar to that of Puerto Rico, while the Madrid dialect shows a rising one. The descriptions and observations lead to the conclusion that the three dialects show three different patterns to express the same pragmatic meaning. In the production part of the experiment it is shown that in absolute questions in BS pitch starts rising in the nuclear accented syllable reaching the maximum height in the post-nuclear syllable due to a high tone in a bitonal HL% to finally fall. Normally, studies only describe the intonational patterns of a given dialect via production tasks, whereas this study demonstrates that these patterns are confirmed in a perception experiment as well. The judgments in perception task reveal the importance of peak positioning (nuclear vs. post-nuclear syllable) and F0 falling movements at the end of the aforementioned questions (L% vs. M% or H%). Therefore, BS should be added to the compilation of nuclear configurations of Spanish absolute questions that have a falling pattern.

At the same time, the study also answers some previous questions in the literature. For example, Elordieta (2003), after analyzing the Spanish intonation of speakers of a Basque pitch-accent dialect, states that the Spanish spoken in the Basque Country may have intonational features different from the ones of what are considered standard Spanish varieties. In this paper, in fact, it has been shown that Bilbao Spanish shows more than a subtle difference when compared to the Spanish of Madrid in regards to the realization of absolute questions. Therefore, further research on this topic is worth pursuing i) to understand the variability of pre-nuclear pitch-accents and of peak positions and heights, ii) to describe and analyze the same kinds of questions and other types of sentences in other areas of the Basque Country and iii) to conduct a cartographical study of this intonational contour. A preliminary study has also shown that speakers of the area with Basque as their mother tongue show the very same configurations in this language. This finding is interesting given the language contact situation and the different syntactic structures of Spanish and Basque and also deserves future research.

References

Armstrong, Meghan E. 2010. Puerto Rican Spanish intonation. In *Transcription of Intonation of the Spanish Language*, Pilar Prieto and Paolo Roseano (eds.), 155-189. München: Lincom Europe.

Astruc, Lluïsa, Elsa Mora and Simon Rew. 2010. Venezuelan Andean Spanish intonation. In *Transcription of Intonation of the Spanish Language*, Pilar Prieto and Paolo Roseano (eds.), 191-226. München: Lincom Europe.

Boersma, Paul and David Weenink. 2009. *Praat: Doing phonetics by computer* (Version 5.1.17) [Computer program]. Retrieved October 9, 2009, from http://www.praat.org/

Canellada, María Josefa and John Kuhlmann Madsen. 1987. *Pronunciación del español*. Madrid: Castalia.

Cunningham, Una. 1983. Aspects of the intonation of Spanish. *Nottingham Linguistic Circular* 12: 21-54.

Cenoz, Jasone. 2005. English in bilingual programs in the Basque Country. *International Journal of the Sociology of Language* 171: 41-56.

Elordieta, Gorka. 2003. The Spanish intonation of speakers of a Basque pitch-accent dialect. *Catalan Journal of Linguistics* 2: 67-95.

Estebas-Vilaplana, Eva and Pilar Prieto. 2010. Castilian Spanish intonation. In *Transcription of Intonation of the Spanish Language*, Pilar Prieto and Paolo Roseano (eds.), 17-48. München: Lincom Europe.

Face, Timothy L. 2003. Intonation in Spanish declaratives: Differences between lab and spontaneous speech. *Catalan Journal of Linguistics* 2: 115-131.

Gabriel, Christoph, Ingo Feldhausen, Andrea Pešková, Laura Colantoni, Su-Ar Lee, Valeria Arana, and Leopoldo Labastía. 2010. Argentinian Spanish intonation. In *Transcription of Intonation of the Spanish Language*, Pilar Prieto and Paolo Roseano (eds.), 285-317. München: Lincom Europe.

García Riverón, Raquel. 1985. La entonación de la variante cubana del español: Perspectivas de investigación. *Español Actual* 55: 103-112.

Garrido, Juan María. 1996. Modelling Spanish intonation for text-to-speech applications. Barcelona: Universitat Autònoma de Barcelona, doctoral dissertation.

Hualde, Jose Ignacio. 2005. *The Sounds of Spanish*. Cambridge, UK/NY: Cambridge University Press.

López-Bobo, M.ª Jesús and Miguel Cuevas-Alonso. 2010. Cantabrian Spanish intonation. In *Transcription of intonation of the Spanish language*, Pilar Prieto and Paolo Roseano (eds.), 49-58. München: Lincom Europe.

Navarro Tomás, Tomás. 1974. *Manual de pronunciación española*. Madrid: Consejo Superior de Investigaciones Científicas.

Ortiz, Héctor, Marcela Fuentes and Lluïsa Astruc. 2010. Chilean Spanish intonation. In *Transcription of Intonation of the Spanish Language*, Pilar Prieto and Paolo Roseano (eds.), 255-283. München: Lincom Europe.

Prieto, Pilar, and Francisco Torreira. 2007. The segmental anchoring hypothesis revisited: Syllable structure and speech rate effects on peak timing in Spanish. *Journal of Phonetics* 35: 473-500.

Prieto, Pilar and Paolo Roseano (eds.). 2010. *Transcription of Intonation of the Spanish Language*. Lincom Europa: München.

Quilis, Antonio. 1987. Entonación dialectal hispánica. In *Actas del I Congreso Internacional sobre el Español de América,* Humberto López Morales and María Vaquero (eds,), 117-164. San Juan, Puerto Rico: Academia Puertorriqueña de la Lengua Española.

Quilis, Antonio. 1988. *Fonética acústica de la lengua española*. Madrid: Gredos.

Quilis, Antonio. 1993. *Tratado de fonología y fonética españolas*. Madrid: Gredos.

Revert Sanz, Vicente. 2001. *Entonación y variación geográfica en el español de América*. Cuadernos de Filología, Anejo XLV. Universitat de Valencia.

Silverman, Kim, and Janet Pierrehumbert. 1990. The timing of prenuclear high accents in English. In *Papers in Laboratory Phonology I: Between the Grammar and Physics of Speech,* John Kingston and Mary Beckman (eds.), 72-106. Cambridge: Cambridge University Press.

Sosa, Juan Manuel. 1999. *La entonación del español: su estructura fónica, variabilidad y dialectología.* Madrid: Cátedra.

Steele, Shirley. 1986. Nuclear accent F0 peak location: Effects of rate, vowel and number of following syllables. *The Journal of the Acoustical Society of America* 80: s51.

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