

Topic and Focus Intonation in Argentinean *Porteño*

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Abstract

This paper investigates the intonation of topics and focus in Argentinean *Porteño*. We have found that whereas tonal alignment is phonetically conditioned, pitch height and duration constitute the main cues to express various types of focus in declarative and interrogative sentences; at least four intonational categories seem to be used by our speakers and the relevance of a register feature is discussed. As for topics, they are marked by special tunes that depend on the type of sentence; in particular, the topic tune in questions is the opposite of those found in declaratives.

Index Terms: *Porteño* Spanish, focus, topic, question, tonal alignment, pitch height, register feature, duration

1. Introduction

It is now well established that, in many languages, intonation plays a major role in the expression of the two main components of the information structure: topic and focus ([1], [2]). In English ([3]), French ([4]–[8]), Modern Greek ([8], [9]) and Spanish ([10]–[13]), among other languages, focus affects the intonation of the whole sentence: it assigns the nuclear pitch accent to the focus word and all the post-focal words are de-accented. Previous studies have also shown that ‘informative’ focus and contrastive focus are given different prominence ([1], [5], [14]). Furthermore, focusing has been found to lengthen the duration of the focus word and to shorten pre- and post-focal parts ([5], [9]). As for topics, they generally appear at the beginning of a sentence and express the ‘aboutness’ of a sentence, that is, “what is being talked about”, and serve as the “the point of departure of the message” (see [15]). They are often described as implying a continuation rise at the end of the topicalized phrase in declarative sentences as in French ([4], [7], [6], [8]) and Modern Greek ([8], [9], [16]); in Spanish, [12] proposed that a phrasal H- indicates the end of the constituent conveying old information. In Greek, though, topics in questions have an inverted intonation pattern compared to that of the topics in declaratives: they display a L* instead of the H* and are right bounded by a low tone ([8], [9], [16]). This tonal inversion may also be produced in French ([4], [6], [8]), and has not yet been adequately explained.

Turning to the Argentinian Spanish, the intonation of the variety spoken in Buenos Aires, called *Porteño*, notably diverges from the Castilian and Latin American standards of Spanish. Pitch peak in pre-nuclear accents is described as being regularly located within the stressed syllable ([11], [17]–[19]) instead of being aligned with the post-tonic syllable as in the other varieties of Spanish. Broad focus declaratives differ from narrow focus ones in the alignment and height of the non-final pitch peaks ([19]–[21]), which happens earlier for the latter. However, in a pilot study investigating the perception of narrow focus in *Porteño*, [22] found that pitch alignment patterns cannot account for the distinction of narrow from broad focus in this dialect. Increasing pitch values and/or vowel duration, as well as de-accenting of material after a word in narrow focus, as opposed to the pitch accents present

in broad focus contribute to a narrow focus perception. Focus thus deserves further study in order to determine its intonational properties in *Porteño*. As for topics, to the best of our knowledge, no study has yet explored their prosodic expression in this variety of Spanish.

This paper investigates the prosodic cues of topic and focus in both declarative and interrogative sentences, adopting the autosegmental-metrical theory of intonation ([23]). Regarding focus, we examine the melodic pattern and the duration of three types of narrow focused words: i) ‘informative’ focused word (henceforth “IFoc”) – i.e. the answering part of a WH-word; ii) *contrastive* focused word (“CFoc”); and iii) a focused word in a *yes-no question* (“QFoc”). These focused words are all located after the topics, in the middle of the sentence, and are compared to a pre-nuclear (“PNucl”) non-focused word in the same position. We aim at determining which pitch accents and edge tones these words are associated with and to what extent tonal alignment, pitch height and duration contribute to distinguish them. Concerning topics, we will examine what type of pitch accent and what type of boundary tone they are associated with; in particular, we will determine whether their tonal pattern varies according to the type of sentence (declarative vs. question).

2. Methodology

In order to trigger the various kinds of focus, we used a question-response paradigm with a general lead-in context about two friends talking about a party. (1) and (2) below are two examples of these dialogues. Topics began the sentences and consisted of either one NP (a head noun and an adjective; cf. (2)) or two XPs (cf. (1)). The different focus words (“Q/C/IFoc” words) were proper nouns (*Penélope*, *Verónica*) in subject position followed by a verb (*hablaba*) and its complements. Except for the verb and the functional words, all words were stressed on the antepenultimate syllable. We obtained eight dialogues. We also used a broad focus sentence with the same structure as the other ones to study the prosody of PNucl word. These dialogues were written on cards and randomized with other sentences designed for other experiments. Each sentence was repeated four times by two female speakers of *Porteño* (one in her fifties, speaker PH, the other one in her thirties, speaker LD). The recordings took place in quiet rooms, and were done using the computer’s sound card (44kHz 16bits) directly.

(1) Qu.: ¿[El miércoles]_{TOP} [en Córdoba]_{TOP} [quién]_{WH-wd} hablaba con Nélica de mecánica?

‘Wednesday, in C., who was talking with N. about mecánica?’

Ans.: [El miércoles]_{TOP} [en Córdoba]_{TOP} [Penélope]_{IFoc} hablaba con Nélica de mecánica.

(2) Q: ¿[El miércoles último]_{TOP} [Verónica]_{QFoc} hablaba... ?

‘last Wednesday was Verónica talking...’

A: No, [El miércoles último]_{TOP} [Penélope]_{CFoc} hablaba...

The acoustic analysis of duration and fundamental frequency (F₀) were done using the Praat software package [24]. To compare the melodic realizations of the speakers and the various types of focus and topics, we converted the

original F_0 values in Hertz into semi-tones (“ST”) by taking the frequency minimum of the utterances as the reference value. Moreover, in the vein of [25] and [26], we also generated time-normalized contours using the syllable as the domain of normalization and a 10-point time resolution per syllable.

3. Results and discussion: focus

Figure 1 below shows the time-normalized F_0 curves in ST of the PNucl and focus words in the different types of sentences (questions and declaratives) averaged across repetitions of the same type of focus.

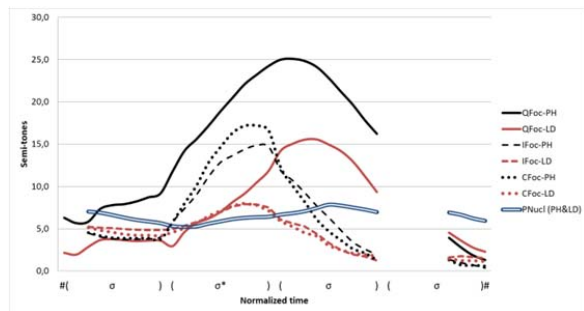


Figure 1: time-normalized curves in semi-tones of PNucl- C/I/QFoc words for speakers PH and LD

3.1. Pre-nuclear noun in broad focus sentences

Figure 1 shows a somewhat unexpected result concerning the pitch accent of the PNucl noun. As seen in the introduction, *Porteño* is said to differ from the other varieties of Spanish by realizing pre-nuclear accents as H^* tones located *within* the stressed syllable. As can be seen in Figure 1, however, the accentual peak appears in the center of the post-tonic syllable, preceded by a low tone aligned with the beginning of the stressed syllable. This accentual ‘late’ rise is actually similar to the one found in the other varieties of Spanish (see [12]).

This accentual peak displacement is likely to be related to the proparoxytonic nature of the PNucl noun *Penélope*. Indeed, the other pre-nuclear proparoxytonic nouns in our corpus (*Verónica*, *Néida*, *mecánica*) display the same tonal alignment; on the other hand, the paroxytonic verb *hablaba* occurs with the expected H^* within the stressed syllable. A closer look at the literature about the prosody of *Porteño* reveals that most words taken into account in the previous studies are paroxytonic (or oxytonic); when proparoxytones are under investigation as in [27]’s study, these nouns undergo the same tonal alignment of H^* as the one found in our recordings (see [27]’s figures).

3.2. Narrow focused nouns

As shown in Figure 1, all speakers realize a clear melodic contrast between the PNucl noun and the narrow focused words in terms of pitch height and tonal alignment. In declarative sentences, C/IFoc words are marked by a F_0 peak located *within* the stressed syllable, generally in the middle of the stressed vowel; we didn’t find any evidence in our data for an early peak marking narrow focalization as reported by [19] and [21]. The peaks of C/IFoc words are preceded by a low tone located in the pre-tonic vowel. Figure 1 also shows that

C/IFoc words are right bounded by another low tone, which reaches the low level of the speaker’s range. Moreover, like in other languages and varieties of Spanish, all words after the focused element in declaratives are realized as a low plateau up to the end of the sentence or, at least, with very reduced pitch accents.

As can be seen in Figure 1, Sp.PH further distinguishes the C/IFoc words from the PNucl word by strongly increasing the height of the focal peaks in comparison with that of the PNucl word (+7.9 ST). Consequently, the words in focus are usually pronounced higher than the other pitch maxima in the sentence (those of the topics; see section 4.), whereas the PNucl high tone appears as downstepped compared to the preceding pitch accents ([11]–[13], [20], [21]). The melodic configurations of Sp.PH are thus along the lines of [19], [20]’s observations that focal peaks in *Porteño* are substantially higher than the non-focal ones. Notice though that Sp.LD does not focus words in this way; PNucl noun and I/CFoc words culminate at the same height.

As for questions, the stressed syllable of the QFoc word is realized by both speakers with a large rising contour (12/15 ST of range). This rise differs from those of the C/IFoc words in the alignment of the pitch peak: starting from the pre-tonic syllable, it ends with a peak anchored to the onset consonant of the post-stressed syllable, and not to the center of the stressed vowel as observed in C/IFoc words. In addition, for both speakers, the tonal peak of the QFoc words reaches a much higher F_0 value than that of the peaks of C/IFoc words; the difference is about 9 ST.

Nevertheless, Figure 1 reveals differences between the speakers as far as the tonal height is concerned. Sp.PH presents the highest F_0 values for the QFoc (25.1 ST), which reaches the top values of her pitch range (*false* voice); she also realizes a pitch height contrast between the IFoc (14.7 ST) and CFoc (17.5 ST) words. On the other hand, although Sp.LD distinguishes between a QFoc word and C/IFoc words, she realizes the QFoc peak at a similar height to that of Sp.PH’s C/IFoc words in declarative sentences.

As far as the tonal pattern of WH-word *quién* is concerned, it seems, *mutatis mutandis*, to be similar to that of the QFoc word. They are both characterized by a rise culminating at the same height. Their peak is aligned with the consonant immediately to the right and is followed by a steep fall. But the intonation of the rest of the sentence differs according to the type of word. In WH questions, all pitch accents rightward from the WH-word are de-accented; there is sometimes an optional final rise such as the one described by [11], [21] and [28]. In QFoc sentences, on the other hand, both speakers systematically produce a rising-falling contour at the end of the sentence; this contour is a kind of copy of the QFoc tone pattern and may be downstepped or not.

3.3. Duration of PNucl and focused words

The duration of the PNucl and focused words is given in Figure 2 below. As in other languages, there is an effect of focus on word duration: PNucl word is shorter than the focused words for both speakers. However, there are notable differences between the speakers. While Sp.PH exhibits a similar duration for all types of focus words, Sp.LD produces the CFoc noun with a much longer duration than the IFoc one; in addition, she greatly increases the length of the QFoc one; in fact, she is likely to lengthen the QFoc and CFoc words in order to compensate her lower F_0 values compared to

those of Sp.PH. Rising pitch or increasing duration thus seems to be two complementary strategies used by *Porteño* speakers to signal question and focus.

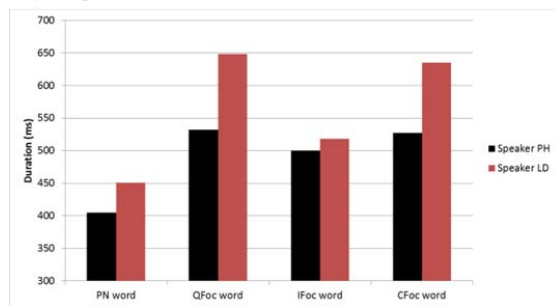


Figure 2: duration of PNucl word and focus words

3.4. Phonological representation

Let us first consider the tonal alignment of the various pitch peaks we have observed so far. It appears that the alignment of these peaks is actually *predictable* from the phonetic context. As seen above, the words in focus ends with a very low tone. Following [12], [29] and [20], we will interpret this tone as a phrasal tone L- and assume that it triggers the displacement of the peak toward the center of the stressed vowel in C/IFoc words. As for the delayed peak on QFoc and WH-words, it may be viewed as the result from an additional effect of the extra-high target to be reached. When there is no phrasal tone, as in PNucl words, the peak surfaces on the post-tonic syllable.

In the spirit of [12] and [20], we will therefore assume a unique underlying $/(L+H^*)/$ pitch accent. The L tone accounts for the low valley that begins the PNucl and focus words and which contrasts with the high onset found at the beginning of the topics in questions (see section 4). The L tone is linked to the onset of the stressed syllable, and the H tone is more loosely associated. Like in standard Spanish, we will suppose that the post-tonic syllable is the default surface location of the H tone if there is ‘enough room’ ([12]) within the word, specifically, within proparoxytones in the case of *Porteño*. However, a gradual phenomenon conditioned by such factors as the proximity of other tones and word boundary moves the peak toward the left. Our proposal is, moreover, consistent with the results of [22] suggesting that, in this dialect, the perception of narrow focus is not achieved by tonal alignment but rather by duration and pitch height. Nevertheless, it remains to clarify whether the early peak in *Porteño*, reported by previous authors, is due to the (par)oxytonic nature of words.

The second issue we need to address is about the representation of the *tonal height* of the proposed pitch accent $(L+H)^*$. Previous authors argued for a binary choice between two categories of high tones contrasting in pitch height: [11] claims a $H+H^*$ pitch accent to account for the pitch range increasing found in questions; [19]–[21] use an upstepped high tone they note “ $\wedge H$ ” or “ \grave{H} ” for capturing the contrast between “neutral” high tones “H” and those marking questions or emphasis. These two categories of high tones allow us to adequately describe the melodic patterns of Sp.LD, using the label $/(L+H)^*$ for the PNucl and C/IFoc words and $/(L+\wedge H)^*$ pitch accent for the QFoc and WH-words.

However, the tonal patterns produced by Sp.PH suggest a phonological contrast between three heights for the pitch peaks: indeed, the difference in pitch height between the

PNucl noun, the C/IFoc words and the QFoc/WH-words varies in the same proportion (8 to 10 ST); and remember that for Sp.PH, pitch height is the only feature that distinguishes the C/IFoc words from QFoc and WH-words. Moreover, Sp.LD dramatically increases duration to distinguish between these different types of words. In other words, we think that there actually is a three-way categorical intonational contrast between the PNucl word, the focused words in declarative sentences and those in questions. But, the speakers adopt a different strategy to achieve this contrast: Sp.LD increases both pitch height and duration whereas for Sp.PH, contrasting pitch height appears to be the main distinctive feature. We will therefore hypothesize the following three pitch accents for Sp.PH: $/(L+H^1)^*/$ vs. $/(L+H^2)^*/$ vs. $/(L+H^3)^*/$, H^3 indicating the top levels of the pitch range. Further investigations have to be carried out to answer whether Sp.LD has the H^3 tone in her intonational system; this tone might signal questions with surprise or incredulity for instance ([28]).

4. Topics

Let us begin with topicalization in the declarative sentences. In sentences with two topics (Figure 3 top), the speakers employ the $(L+H)^*$ pitch accent on each topic. The accentual H tone undergoes the gradual moving toward the left we’ve seen on the focus, that is, when the post-tonic syllable bears a low target, the H tone aligns with the middle of the stressed syllable (see F_0 track “D-2TOP-1”); if there is no subsequent low tone (“D-2TOP-2/3”), then the H tone appears on the post-tonic syllable. Both topics may end with a high tone that we analyze as a phrasal H-; this H- either surfaces as a rising contour LH- (“D-2TOP-1”) or as a level high tone from the accentual H (“D-2TOP-2”). This is along the lines of [12] who proposed a phrasal H- signaling old information. In some recordings (cf. “D-2TOP-3”), however, there is a gradual fall from the accentual H up to the following accentual L belonging to the subsequent topic or focus; in other words, topics may end with no tonal target. Finally, note that there is no evidence for downstepped or upstepped topics.

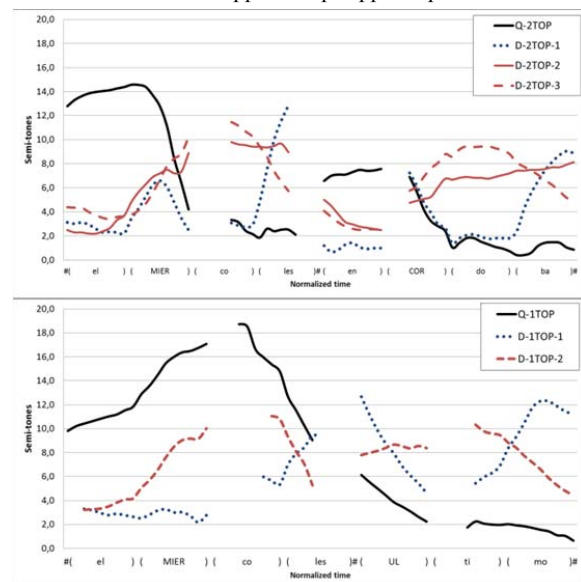


Figure 3: time-normalized F_0 tracks in ST for the topics in questions (“Q-”) and in declaratives (“D-”). Top: two topics (2TOP); bottom: one topic (1TOP).

As for the topics comprising a single NP (Figure 3 bottom), two strategies are employed by the speakers. Sp.LD generally uses sequences of two [(L+H)*Ø] tunes associated with each lexical word (cf. “D-1TOP-2”) and where the high peak is delayed because of the lack of phrasal tone. Sp.PH (cf. “D-1TOP-1”) usually realizes the stressed syllable of the head noun *miércoles* with an L* tone, which is followed by a gradual rise to the beginning of the accented syllable of the adjective *último*. The adjective bears a single H* tone, which appears early within the stressed syllable because of the rising contour LH- ending the topic and the absence of an accentual leading L; we will label this topic tune as [L*..H* LH-].

Turning to questions, the tonal patterns of the topics are remarkably stable across both speakers; Figure 3 thus displays a unique averaged F₀ curve for each type of topic. In sentences with two topics, the tonal pattern of each topic is characterized by a steep fall on each stressed syllable, whose onset is associated with the peak and the end with the low target. We will represent this pitch accent as (H*L*), with two starred tones to indicate that they both associate within the stressed syllable. As can be seen in Figure 3, there is no evidence for a low tone before the H*: the melodic onset of the topics is almost at the same height as that of the H* and this clearly contrasts with the low onset at the beginning of the topics in declaratives or of the PNUcl / focus words. The presence of an L* within the stressed syllable is further demonstrated by the very early alignment of the H* in comparison with those we have seen so far. Each topic ends with a low tone pronounced in the lowest part of the speakers’ pitch range like the one right bounding the focus; we will therefore analyze this low tone as a phrasal L-.

As Figure 3 shows, the H* tone of the second topic is a lot lower than the first topic H* tone (about 7 ST) and accordingly seems to have been downstepped by the preceding H*L*. However, the H* tone of the second topic reaches similar values (around 7 ST) as those of the peaks found on the second topic in declarative sentences. Moreover, an intermediate phrase boundary (L/H-) arguably blocks any downstepping rule. On the other hand, there is a markedly increase in pitch height of the first topic H* tone in questions compared to the height of those found in declaratives (around 7/8 ST). In fact, the height in ST of the first topic H* tone corresponds to that of the focus in declarative sentences pronounced by Sp.PH or that of the QFoc uttered by Sp.LD (14-17 ST); we will thus claim that this H* tone belongs to the same tone category as the focus one, namely the H² category.

As regards the questions with a single topic, we also observed a unique tune for both speakers, we will represent as follows: [H²*..L* L-]. This tune is characterized by an H²* tone occurring at the end of the first stressed syllable. Again, this H²* tone distinguishes itself from those occurring in declarative sentences in terms of pitch height (17 ST vs. 9 ST/ 3 ST respectively). It is connected to an L* tone appearing on the stressed syllable of the subsequent adjective by a gradual fall; the L* tone is then followed by a phrasal L-. Like two-topic sentences, no phonological tonal target is inserted at the onset of this tune because melodic curve confirms that the F₀ values at the beginning of the topics depend on the vicinity of the H²* tone: the closer to the beginning the latter is, the higher the F₀ is produced.

The similarity between the tunes of both types of topicalization leads us to propose a more general template that we will note [(H²*..L*) L-]. (H²*..L*) refers to a ‘splitting’

pitch accent where both starred tones *must* be realized *within* a stressed syllable: inside a topic phrase, either they associate to separate stressed syllables as in the case of the single topic or, if there is only one stressed syllable, they both associate to the latter as we saw it in sentences with two topics.

We will conclude this paper with two final considerations. First, like in Modern Greek and French (cf. [7]–[9], [16]), it appears that, in *Porteño*, topic phrases in declaratives and questions exhibit opposite tonal patterns: in questions, topics have a (H²*..L*) pitch accent followed by a L-, whereas, in declaratives, they have a (L+H)* or a L*..H* pitch accent followed by a H-. This type of inversion is thus likely to be a common intonational phenomenon that would deserve to be investigated and understood in more depth. In particular, one may wonder whether it is due to some phonological rule of tone inversion ([8]) or to a perception-oriented process that would help the listener determine whether the utterance she is processing is a declarative or a question. The tone inversion could also be induced by a difference in the activation state of the discourse referents in the sense of [15] (see also [16], [30], [31]): in our corpora, the topics of the questions are actually *inactive* (‘new’) whereas those of the declarative are *active* (‘given’).

The final point we wish to address is about the phonological structure of pitch height in *Porteño*. We saw that one can distinguish three (Sp.LD) or four (Sp.PH) pitch levels, which were given scalar values (L, H¹, H² and H³). Like in tonal languages ([32]–[34]), however, it may be more accurate to use binary features such as the [±Upper] – a ‘register’ feature – and [±high] of [33] to account for the various pitch levels of *Porteño*. Within this system, we obtain the following equivalences: H³=[+U,+h], H²=[+U,-h], H¹=[-U,+h] and L=[-U,-h].

The main advantage of using these features is that it allows making generalizations across the speakers and the tonal patterns of the sentences. Thus, instead of merely seeing that Sp.LD uses a H² to signal questions and Sp.PH a H³, it may now be stated that all speakers mark questions with the [+U] feature. Furthermore, being an autosegment, this feature may associate with other [high] features within the sentence. This would account for the increased pitch appearing both at the beginning and the end of questions. Let’s say that *all* accentual tones in questions, except the one linked to the QFoc and WH-words ([+U,±h]) are actually underlying *low* tones, i.e. [-U,-h]. One may now propose that questions are further marked by the association of the [+U] borne by QFoc and WH-words with the *first* pitch accent of the sentence, generating a [+U,-h]* tone (i.e. H²*), and, optionally, to the *final* sentence accent or boundary tone, giving the final rising or falling contours. Using a unique feature [+U] allows to generalize [11]’s proposal of a sentence initial H% and a H+H* pitch accent that express questions in Spanish: [11]’s H% and a H+H* are two distinct objects but they both have the same effect of upstepping pitch; on the other hand, a single [+U] feature provides a unified explanation to the increased pitch characterizing questions in Spanish.

5. Acknowledgements

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