



Cabrera Abreu, Mercedes and Vizcaíno Ortega, Francisco. 2022. Prosodic correlates of communication: boundary tone choice as an instruction for message interpretation from a multilevel linguistic perspective. *Revista de lenguas para fines específicos* 28.2, pp. 221-241 · <https://doi.org/10.20420/rlfe.2022.560>

Paper received: 18 March 2022

Paper received in revised form and accepted for publication: 27 September 2022



# Prosodic correlates of communication: boundary tone choice as an instruction for message interpretation from a multilevel linguistic perspective

Mercedes Cabrera Abreu<sup>1</sup> ·  <https://orcid.org/0000-0002-7880-1460>

Universidad de Las Palmas de Gran Canaria

C/ Pérez del Toro, n<sup>o</sup>1, 35003 Las Palmas de Gran Canaria, Islas Canarias, España

Francisco Vizcaíno Ortega ·  <https://orcid.org/0000-0002-5097-1820>

Universidad de Las Palmas de Gran Canaria

C/ Pérez del Toro, n<sup>o</sup>1, 35003 Las Palmas de Gran Canaria, Islas Canarias, España

## ABSTRACT

Most intonational studies of Spanish declarative sentences do not include a phonetic-phonological approach integrating the description of intonation tunes together with their pragmatic interpretations in the framework of a multilevel theory of communication. In this paper, we present a discourse-oriented analysis of read news speech in Spanish. Its integrated two-fold orientation in terms of the universally well-accepted intonational framework, the Autosegmental-Metrical Theory, together with another universally recognised cognitive theory of communication, Relevance Theory, reveals that boundary tones constitute a powerful phonological unit to lead subjects through a structured discourse, and a contextualised presentation of information. In addition, our multilevel model of boundary tone interpretations also accounts for the socio-cultural use of politeness together with its orientation towards the different individuals in the communicative act: the speaker, the hearer, or both.

*Keywords:* Boundary tones, discourse, information status, politeness, relevance.

## RESUMEN

La mayoría de los estudios de entonación de las declarativas en español carece de un enfoque fonético-fonológico que relacione la descripción de sus contornos con las interpretaciones pragmáticas de los mismos en el marco de una teoría multinivel de la comunicación. En este artículo ofrecemos un análisis del discurso del habla utilizada en las noticias leídas en español. La doble orientación de este análisis, con dos teorías ampliamente aceptadas, (la teoría métrico-autosegmental para el estudio de la entonación y la teoría de la relevancia para el estudio pragmático de los enunciados), revela que los tonos de frontera constituyen una poderosa unidad fonológica que guía a los sujetos a través de la estructura del discurso y de la presentación contextualizada de la información. Nuestro modelo multinivel explica, asimismo, el uso socio-cultural de la *cortesía* y su orientación en relación con los distintos actores del acto comunicativo: el hablante, el oyente, o ambos.

*Palabras clave:* Tonos de frontera, discurso, status de la información, cortesía, relevancia.

## 1. Introduction

The main research question we address in the present paper is why radio news readers read the way they do in the specific case of their production of Spanish declarative sentences; specifically, to what extent they succeed in transmitting a coherent, understandable message while still following a standard reading style. To answer this question, in section 2 we first offer an overview of the intonation of declarative sentences in Spanish, paying

<sup>1</sup> Corresponding author · Email: mercedes.cabrera@ulpgc.es



special attention to their pitch inflections towards the end of the contour, together with discourse-related notions. In the same section, we also refer to Spanish declarative sentences following the Autosegmental-Metrical theory of intonational phonology (Pierrehumbert, 1980; Ladd, 1996), and more specifically the annotation system known as Sp\_ToBI (Beckman *et al.* (2002) and Estebas Vilaplana and Prieto (2008; 2010)).

Section 3 presents a short description of the role of prosody in read news style. In an attempt to explain how subjects fulfil their task of being informative by resorting to intonation, in section 4 we turn to Relevance Theory (henceforth RT) as the framework we adopt to understand the mechanisms underlying human communication, and more specifically, to House (1990 and 2006) as two proposals that bring together the principles of RT and intonation analysis.

Focused on the intonation of Spanish declarative sentences and within the tradition of RT in utterance interpretation, Dabrowski and Labastía (2013) is also discussed in section 5.

In section 6 we describe our data, 24 read-news from the Glissando corpus (Garrido- Almiñana *et al.*, 2013), approximately 72 hours of speech. As the paper unfolds in section 7, it becomes apparent that news readers resort to intonation as the mechanism to guide the hearer towards their desired interpretation at two of the three different levels put forward in House (2006): the discourse level and the linguistic level. Another issue investigated in the discussion section concerns the pragmatic interpretation of a tune already attested in Estebas-Vilaplana *et al.* (2015): sustained pitch. The boundary tone =%, proposed by the latter authors in virtue of its contrastive value in the tone system, captures the height reached by the last tone in the nuclear pitch accent and thus accounts for such sustained level at the end of the tune. Mostly found in non-final clauses, its basic interpretation is “the message is incomplete, non-final”. In the present paper, we go beyond this result at the discourse level and explore its impact at the linguistic and socio-attitudinal level by incorporating the pragmatic concept of politeness into our analysis. We show that news readers exploit sustained pitch as a resource to express politeness towards their audience. Finally, the conclusions are offered in section 8.

## 2. Spanish declarative tunes: annotations and meanings

Sosa (1999) constitutes the first description of Spanish intonation following the Autosegmental-Metrical approach. Furthermore, wherever possible, he incorporates raw descriptions of the meanings manifested by tunes. He groups declarative sentences into three categories depending on their final pitch contours: falls, sustained and rises. Falling and sustained pitch share the same boundary tone L%<sup>2</sup>, while rises are accounted for by H%.

In Beckman *et al.*'s (2002) system of tones, L% and H% are used, the former in the rheme constituent of unmarked broad focus statements to indicate finality. They also propose a new unit, the mid tone M%, to account for tunes ending either at relatively mid pitch (or a half-rise) or mid-level plateau.

Estebas-Vilaplana and Prieto (2010) also incorporate M% to account for relatively mid pitch at the right edge of statements of the type “Puede que no le guste el regalo que le he comprado” (‘S/he may not like the present I bought him/her’), in which the speaker conveys an interpretation which could be paraphrased as “I’m uncertain about my claim”. Their description includes a detailed taxonomy of the meanings conveyed by an extensive list

<sup>2</sup> Sustained pitch is accounted for by the sequence H\*+H L%. The trailing tone (+H) triggers upstep of L%, so that its realization is at the same phonetic level as the previous H. This results in high sustained pitch (Sosa, 1999: 129).

of tunes elicited by setting participants in the data-recording sessions in a particular contextual situation and in a semi-controlled fashion.

### 3. Read news style

Prosody is unmistakably a key factor in the process of communication both from the perspective of the speaker, who wants to be informative, and from the perspective of the listener, who wishes to be informed. In the case of radio broadcasts, prosody is one of the fundamental tools the news presenter can use to attract and keep the audience's attention. Most importantly, it is one of the linguistic devices which listeners tune into to interpret the information given. It comes as no surprise, then, that news presenters must use specific strategies designed to achieve such purposes, and that some strategies end up in the creation of a specific news-reading style. Two issues have to be borne in mind, though: first, news readers must find a balance between their news-reading style and their informative capacity, so that the production of a too lively chanting-style doesn't prove scarcely meaningful, or the use of a monotonic, uninflected-style turns information unintelligible. Second, news readers must ensure that they process the information efficiently and, consequently, set correct relationships among IPs. In our corpus, different professionals were asked to read the same set of news, which means we have encountered cases in which the propositional content of a particular set of subsequent IPs is interpreted differently, something which by no means undermines our proposal, as individuals organise their discourse depending on their own interpretation of the message.

### 4. Pragmatics, intonation and information structure in English declarative sentences

The three-way distinction drawn by House (2006) in relation to different functional orientations of prosody may clarify both our understanding of the news reader's choice of boundary tones and the direct mapping with their pragmatic interpretations. According to House (2006), intonation may procedurally encode information at different levels: as a vehicle to provide information about the speaker, about the message, or about the discourse. Rather than being exclusive to each other, these orientations are different contextual areas a single tune points at. In the orientation towards the speaker, a specific tune may transmit, for instance, something about her attitude, social identity, or regional origin. Within the wide concept of speaker's attitude and social identity, there is also the notion of *politeness*, that is, the use of a particular tune in order to mitigate the strength of a specific piece of information in a given social situation. For example, it is well-known (Wells, 2006) that, in English, a low-rise tune, L\*!H%, is typically used by speakers who transform imperative sentences, or commands into polite invitations. In section 7, we turn to a description of the intonational manifestation of *politeness* in our read-news speech.

As far as the orientation towards the linguistic message is concerned, prosody may contribute, for example, "to the propositional content in some way, or to clarify the context which the listener should use to recover the speaker's meaning" (House, 2006: 1554). Hence, a specific piece of information can be freshly introduced to the conversation, or it can be retrieved from the context. This can be understood in terms of the linguistic values assigned to information in terms of the pair *foreground* (f) and *background* (b), which itself stems from the traditional distinction between *new* and *old* information, only that the decision as to what is to be presented as (f) or (b) rests solely on the speaker's decision, not on the linguistic nature of the utterance, as the terms *new* and *old* do. In English, for example, the intonation contrast represented in terms of L% and H% in (1) correlates with a different interpretation of the propositional content of their IPs.

- (1) IP1: “The children went on a ski<sup>3</sup>-trip” H\* L%  
 IP2: “The children went on a ski-trip” H\* H%

L% in IP1 is interpreted as the speaker’s wish to present the information as (f), and to process its contents in order to achieve cognitive effects. This may occur in a situation in which a mother returns home and, as she opens the front door and notices there are no kids around, the father says this utterance, as he infers from his wife’s look that she is wondering how it can be so quiet. That is, he may assume that she is thinking something like “why is it so quiet in here?”, and he resorts to L% in order to fulfil his wife’s expectations, as she lacks that specific information. On the other hand, IP2, with H%, is interpreted as an instruction to check or contrast something about its propositional content in the context of the conversation. The father now resorts to final rising intonation when he notices his wife’s facial expression of surprise. She knew about an invitation for a ski-trip from the children’s school, but has forgotten about it. Using rising intonation over an utterance whose information is part of the background, he is signalling a reactivation of such information, and even though it is old, he is, indeed, bringing it to the foreground.

Last, but not least, intonation can contribute to the “on-going process of constructing discourse (sic), with an orientation towards [...] the structure of a text, for example in scripted or semi-scripted monologue” (House, 2006: 1554). As far as this process is concerned, House (2006: 1554) defines the interpretative value of H% in the following terms:

A procedural hypothesis concerning the high boundary tone (H%) itself is that it encodes an instruction to interpret the preceding phrase as part of a larger piece of structure, thereby giving it an open-ended status, and indicating a wider context.

Thus, H% accounts for the high rising tune (or High Rising Terminal – HRT - after Cruttenden (1995)), whose interpretation in its orientation towards discourse is to signal “open-endedness, continuity, non-finality, or a need to check with participants in the interaction that they are successfully negotiating common ground”. Conversely, L% encodes the discourse instruction of completion, ending, discontinuity, finality.

Another notion developed in House (1990 and 2006) is the Processing Unit (henceforth, PU), which is a mechanism that structures the discourse in terms of sets (rather than individual units) of IPs. According to its form, a PU is made up of a sequence of IPs which are grouped together, for they are closely related in terms of their shared topic or subtopic. Furthermore, every PU exhibits a high key at its beginning, and almost reaches the speaker’s lowest pitch at its end. Additionally, these ends can also be signalled by silences or clear pauses located right after an IP, which exhibits the effects of declination. With respect to their main function, PUs organise the discourse into thematic units and guide the hearer efficiently through different interpretative sections of the discourse at a low processing effort. The phonetic manifestation of PUs will turn out extremely useful in our analysis of the read-aloud news, as they clearly signal changes from one topic to another, or to a sub-topic, thus rendering the discourse structure more evident.

## 5. Pragmatics, intonation and information structure in Spanish declarative sentences

In this section we turn to another valuable piece of research on the intonation of Spanish declarative sentences, Dabrowski and Labastía (2013), since they stand as our point of departure for the analysis of the intonation and communicative interpretations of our radio news corpus in terms of RT. Labastía (2011) and Dabrowski and

<sup>3</sup> We follow the convention of using underlining to show the nuclear accented syllable.

Labastía (2013) offer a description of the nuclear accents of declarative utterances in the spontaneous speech of Buenos Aires Spanish, together with a detailed analysis of their interpretations within the framework of RT (Sperber and Wilson, 1995, Wilson and Sperber, 2004, and Wilson and Wharton, 2006). Following the Sp\_ToBI annotation conventions used in Prieto and Roseano (2010), Labastía (2011) demonstrates how specific nuclear contours (fall L+H\* L%, fall-to-mid L+H\* M%, and low-rise L\* M%) are all used as the vehicle to express the information status of the IPs with which they are associated, and contribute both to discourse structure and to the achievement of relevance. In this sense, L+H\* L% is interpreted as an indication that the processing of the information in its IP yields cognitive effects, and that the construction of the discourse is complete. Consequently, the process towards relevance is finished. On the other hand, speakers resort to L\* M% and L+H\* M% to signal both the deferment of the assessment of relevance of its IP until further IPs to come, and the ongoing construction of the discourse.

Labastía's (2011) description is of great value for us since, we believe, it paves the way for a descriptively adequate and explanatory powerful account of prosody and meaning in Spanish. Dabrowski and Labastía (2013) move a step further on this same path.

An issue to bear in mind is that Labastía's (2011) description shows a two-way distinction in the phonological system of boundary tones, M% and L%, together with their different pragmatic interpretations. The fact that his proposal for Spanish is based on a description of English should trigger some degree of caution in our analysis or predictions. As Fretheim (2002) warned, there might be language-specific constraints on the shape of intonation which condition what seems to be universal interpretations based on tonal choice. As we proceed along with Dabrowski and Labastía's (2013) description, we realise Buenos Aires Spanish is a variety which requires a richer inventory of tonal labels. Such a system reflects the speaker's wish to convey three different instructions as to how to evaluate the information in the communicative process.

For Buenos Aires Spanish, the authors now represent rising tunes ending in H%, and not only M%. The information in IPs ending in H% is to be interpreted by hearers also as an indication to postpone the evaluation of relevance and, consequently, that the context is being built. The difference in interpretation with M% follows from the fact that H% signals, additionally, that the matter is already part of the context, it is accessible, and retrievable, for it has been mentioned earlier, or it is linked to some kind of antecedent which can be inferred from the context. Thus, this proposal is on a par with the one put forward by House (2006), from which they also borrow the notion of foreground and background and the grouping of IPs into PUs. The only difference with RP English is that, in the case of Argentinian Spanish, one extra tone, M% (interchangeable with !H%), is incorporated into the phonological system. Consequently, the set of pragmatic interpretations are fine-tuned in the sense that they match this new three-way distinction.

One of the main advantages of this approach is that it allows for the formulation of generalisations: L% signals that the construction of the discourse is complete, and that the process towards relevance is finished; H% is interpreted as an indication to the hearer to reactivate background information; and M% (or !H%) constitutes an instruction to incorporate information to the background. Thus, boundary tones become landmarks that guide the hearer through the processing and understanding of the information - and information structure - in the act of communication.

## 6. Data description: *Glissando*, an annotated corpus for speech and communication analysis

The *Glissando* corpus (Garrido-Almiñana *et al.*, 2013) includes two different sets of data: a news sub-corpus - from which we extract our data - and a dialogue sub-corpus. Over 25 hours of speech are recorded by 28 speakers per language (Catalan and Spanish), eight of which are professionals, either radio news broadcasters or advertising actors. The corpus is transcribed aligned with the acoustic signal and annotated prosodically. As far as the annotation conventions are concerned, these follow the ToBI system, and more precisely Cat\_ToBI for Catalan (Prieto, 2014 and references therein) and Sp\_ToBI for Spanish (Beckman *et al.*, 2002; further revisions in Estebas-Vilaplana and Prieto (2008, 2010); Gutiérrez-González and Aguilar-Cuevas (2015); and the ones included in the present paper). In the case of the corpus in Spanish, the annotation process was performed by trained transcribers using PRAAT<sup>©</sup> (Boersma and Weenink, 2021).

### 6.1. The read-news corpus

For the present study, 24 pieces of news have been annotated: 12 read by a female radio news broadcaster, and 12 read by a male<sup>4</sup> professional reader with an advertising professional profile. A total of 30 minutes of speech is analysed, and each piece of news lasts approximately one minute. The news data set is essentially composed of long declarative sentences, whose renderings exhibit the typical chanting style referred to in section 3. The news texts were created as described in Garrido-Almiñana *et al.* (2013). They were written specifically for the creation of *Glissando* with the objective of offering a corpus eligible for phonetic and communication studies. Thus, based on a set of real news from two Spanish radio stations (for Spanish and Catalan), the texts went through a computational, automatic process of manipulation in order to incorporate a randomized set of phonetico-phonological phenomena, while their structural organisation remained as close to the originals as possible. In addition, care was taken that such phenomena were representative enough of each of the two languages.

### 6.2. Annotation conventions

As stated, the annotation process was performed using PRAAT<sup>©</sup> (Boersma and Weenink, 2021); thus, a trained transcriber visualizes a display of the signal (F0 curve and waveform) and relies on auditory and visual information to make decisions on prosody. Such decisions are subsequently revised by one more transcriber. Thus, by listening to the speech signal, the transcriber annotates pitch accents, boundary tones, and break indices (some of these can be seen in Figures 1-6 below). Pitch accents can be either monotonal (H\* or L\*) or bitonal (L+H\*, L\*+H, and H+L\*), and they account for different pitch profiles over an accented syllable: high or low pitch targets or rising and falling movements. Boundary tones, H%, !H%, L%, and =%, account for pitch targets at relatively different pitch levels at or towards the end of the IP: high, mid, and low. The boundary tone =% is used to annotate perceived sustained pitch, whose F0 trace looks like a plateau. Such a steady pitch interval can manifest itself at different frequencies which are predictable from the last tonal unit in the nuclear accent. Boundary tones can also be bitonal (L!H% and LH%), and their manifestation shows either a low-rise to mid-pitch or to high pitch over the interval between the last accented syllable and the end of the IP. The last pitch

<sup>4</sup> During the annotation process with PRAAT<sup>©</sup> (Boersma and Weenink, 2021), the pitch range settings were adjusted differently for the female speaker, 50/75 Hz – 300/350Hz, and for the male speaker, 30/55 Hz – 200/250 Hz.

accent in an utterance, together with the boundary tone, are the two phonological units that make up the nuclear contour.

Finally, in the traditional Sp\_ToBI system, break indices (henceforth BI) are responsible for showing up to 4 different levels of prosodic phrasing<sup>5</sup>. Concerning the edge tones, BI 3 and BI 4 are transcribed at the limits of intonation phrases (or IPs). The only difference between BI 3 and BI 4 is found in the type of information included in their respective IPs: BI 3 is labelled in those cases in which the information in the IP is understood as incomplete or non-final in a PU, and BI 4, when the information is taken to be complete. In this sense, BI 4 signals the rightmost edge or end of a PU, and a subsequent IP would show a clear change in topic, and consequently, it would belong to a new PU. Phonetically, this break is manifested as either a silence or a pause followed by a pitch reset.

## 7. Multi-level interpretation of boundary tones

In this section, we present tokens that illustrate the set of boundary tones together with an analysis of their interpretations from the discourse, linguistic, and socio-cultural levels. The section ends with an analysis of =%, which, unlike the other tones, reveals itself as a unit whose pragmatic interpretations depend on two conditions: a) the interpretations signalled by the pitch level set by the last tone in the nuclear accent, H(\*), !H(\*) or L(\*); and b) its own nature as a socio-cultural marker of politeness.

### 7.1. Discourse and linguistic pragmatic interpretations of L%, H%, !H% and =%

Since our news corpus contains declarative sentences only, there is a high occurrence of L% at the end of IPs manifested as relatively low pitch located near the speaker's baseline, or as a descent if preceded by an (L+)H\* pitch accent. Also, this pitch accent recurrently alternates with !H%, resulting in a fall to mid pitch. This contrastive pitch behaviour is illustrated after the word *Bolt* in Figures 1 and 2, respectively.

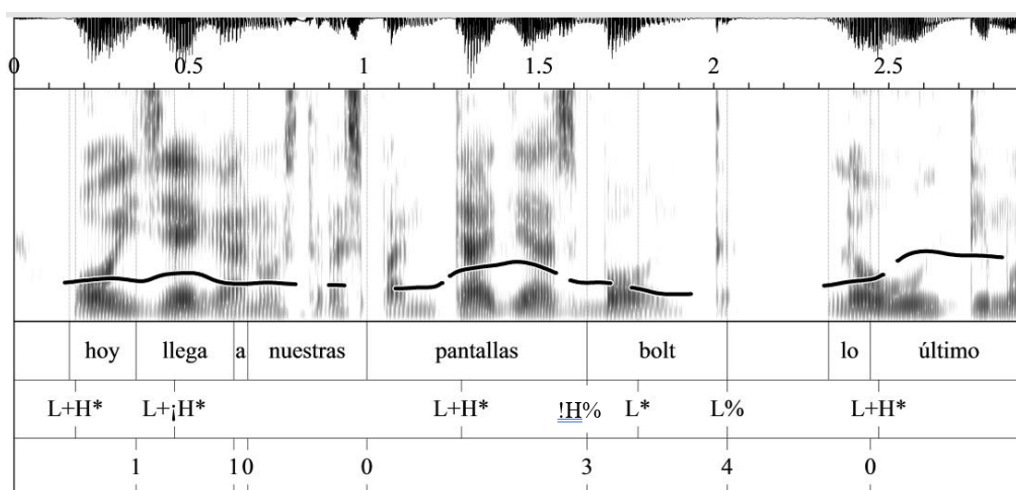


Figure 1. Waveform, spectrogram and F0 trace for the statement *Hoy llega a nuestras pantallas Bolt, lo último [...]* 'Today playing in theatres we have Bolt, the last movie from [...]' produced with two IPs. IP1 ends with L+H\* !H% and IP2 ends in L\* L%.

<sup>5</sup> BIs 0 and 1 are easily retrievable from the waveform, spectrographic and F0 displays.

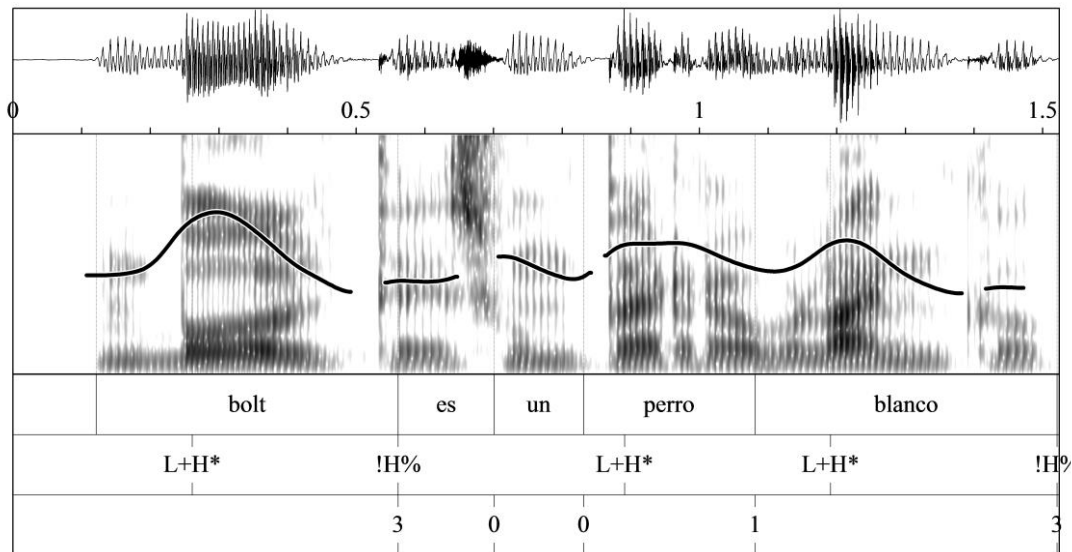


Figure 2. Waveform, spectrogram and F0 trace for the statement *Bolt es un perro blanco* [...] ‘Bolt is a white dog [...]’ produced with two IPs ending in !H%.

These utterances have been extracted from a single piece of news, and they belong to its third PU, whose subtopic is dedicated to the identification and synopsis of one of the movies being shown during Christmas time. With this token, we wish to show that news readers resort to different boundary tones in order to establish the discourse organisation, and the linguistic status of two IPs with an identical wording. A short section of their contexts, made up of various IPs, is shown in (2) and (3) below. There are three intervening IPs which are irrelevant for the purposes of our illustration and have been excluded.

- (2)<sup>6</sup>
- |   |     |
|---|-----|
| IP1: “Hoy llega a nuestras pantallas” ‘Today playing in cinemas there is’ | !H% |
| IP2: “ <u>Bolt</u> ”, ‘Bolt’  | L%  |
| IP3: “lo último de la factoría” ‘the last movie from’                     | !H% |
| IP4: “ <u>Disney</u> ”. ‘Disney Productions’                              | L%  |
- (3)
- |   |     |
|---|-----|
| IP1: “se podrá ver de forma <u>convencional</u> ” ‘it can be watched in 2D’ | H%  |
| IP2: “o también en tres <u>dimensiones</u> ”. ‘or also in 3D.’              | L%  |
| IP3: “ <u>Bolt</u> ” ‘Bolt’   | !H% |
| IP4: “es un perro <u>blanco</u> ” ‘is a white dog’                          | !H% |
| IP5: “que <u>trabaja</u> ” ‘that works’                                     | !H% |
| IP6: “para la <u>televisión</u> ” ‘for television’                          | !H% |
| IP7: “y que <u>cree</u> ” ‘and that believes’                               | !H% |
| IP8: “que tiene <u>superpoderes</u> ” ‘it has a superpower’                 | L%  |

In the IPs in (2) the news-reader informs about a premier at the local cinemas of the film entitled ‘Bolt’, and adds a further piece of information concerning its production. IP1 provides information which is already known to the hearer since it was mentioned with different words in PU2; using !H%, the reader signals that it is background, and that more about this issue is to follow. IP2 includes the actual title of the movie, and the hearer

<sup>6</sup> Excerpt from *sp-m09a-prn02*. This code is interpreted as follows: the voice belongs to a European Spanish (sp), male (m) speaker, who is a professional from the advertising community (a), and the news belongs to the prosodic corpus (prn). The first set of digits stand for the reader’s ID number, and the second one, for the ID of the piece of news.



assumes that this information is foreground, as its IP shows L%. In terms of discourse structure, IP1 is a section of the on-going process towards relevance, and IP2 fulfils this process, as it presents enough information for both IP1 and IP2 to be interpreted. Thus, by virtue of the occurrence of L% in IP2, IP1 can be fully understood. IP3 and IP4 follow the same linguistic and discourse structure, signalled by another sequence of !H% and L%.

Let us now turn to IP3, Bolt, in (3). On this occasion, the news-reader resorts to !H% as an instruction to the hearer to postpone assessment of relevance, and to take on board this piece of information (background), since he is about to begin the process of adding a set of characteristics pertaining to the dog (in IP4-IP8), all of which contribute to the dog's characterization. Thus, once IP8 with L% is reached, the process towards relevance is complete.

There is an argument which supports our analysis of Bolt in (2) and (3). If we were to swap between boundary tones across IP2 in (2) and IP3 in (3) as shown below in (2') and (3'), this would trigger a rather cost effective interpretation, since it would require a greater effort from the hearer to understand the issue at stake, as we shall explain below.

(2')	IP1: "Hoy llega a nuestras pantallas" 'Today playing in cinemas there is'	!H%
	IP2: " <u>Bolt</u> ," 'Bolt'	!H%
	IP3: "lo último de la factoría" 'the last movie from'	!H%
	IP4: " <u>Disney</u> ". 'Disney Productions'	L%
(3')	IP1: "se podrá ver de forma convencional" 'it can be watched in 2D'	H%
	IP2: "o también en tres dimensiones." 'or also in 3D.'	L%
	IP3: " <u>Bolt</u> " 'Bolt'	L%
	IP4 "es un perro blanco" 'is a white dog'	!H%
	IP5: "que trabaja" 'that works'	!H%
	IP6: "para la televisión" 'for television'	!H%
	IP7: "y que cree" 'and that believes'	!H%
	IP8: "que tiene superpoderes" 'it has a superpower'	L%

!H% in IP2 in (2') is now *background*, which leads onto the assumption that only the information in IP4 of (2') is *foreground* by virtue of showing L%. This would guide the hearer onto another assumption: the Disney factory has produced a movie. The fact that the Disney factory produces movies is well-known by the standard audience, so there must be a reason why the news-reader treats this piece of information as *foreground*. It might be that this factory has been off-work for some time, and now, it is back in business. If we pursue this assumption one step further, probably, the hearer would have expected more information concerning Disney's return to work, but what she hears points in a different direction; as she carries on listening to the piece of news, she listens to a description of the movie *Bolt*, and no further information concerning Disney's corporation is offered. In this unexpected and confusing situation, the hearer might assume that she must have missed a piece of information, and run through another cognitive effort, i.e., a search for other interpretations which fit into the context. By the time this point is reached, the hearer has already invested a great amount of effort in pursuit of a cognitive reward, but it has turned out fruitless. Now, she is left to wait for more information to come in order to understand the message. Thus, the misunderstanding, which arose as a consequence of the news-reader's misuse of !H%, has guided the hearer in the wrong direction; it has cost her all this processing effort and has led her finally, and after a long journey, onto the interpretation that *Bolt* is the premier for this Christmas in town.

Let us now turn to the analysis of L% for IP3 in (3'). This would be interpreted as foreground information, which clearly clashes with the surrounding context: looking backwards to previous IPs, Bolt is already in play, so its production with L% must indicate something worth inferring. We could push this process of interpretation still further if we recall one of the features pertaining to the notions of background and foreground which are well-established in communication: they are dynamic values, so it might be possible to assume that the news-reader has decided to treat the dog's name as foreground instead of the expected background for some particular reason. For instance, had the dog's name been translated into Spanish as Rayo in the actual text of the piece of news, the Spanish listeners may have inferred that its name stands as a cover term for its own characteristics which are listed in the IPs to follow. But all these inferences and assumptions are not immediately accessible to the Spanish audience, since their translation is absent from the piece of news itself. To sum up, then, the question here is not what counts as a correct/incorrect boundary tone choice, but rather, that the processing effort triggered by a swap in boundary tones over two different renditions of the utterance *Bolt* turns out to be too costly, and may lead onto an incongruent interpretation of the information when contrasted against the context gradually being presented by the news-reader.

Another case illustrates the explanatory capacity of our integrated pragmatic-discoursal and linguistic-prosodic approach is shown in figure 3, which includes the tunes of most of the IPs in (4).

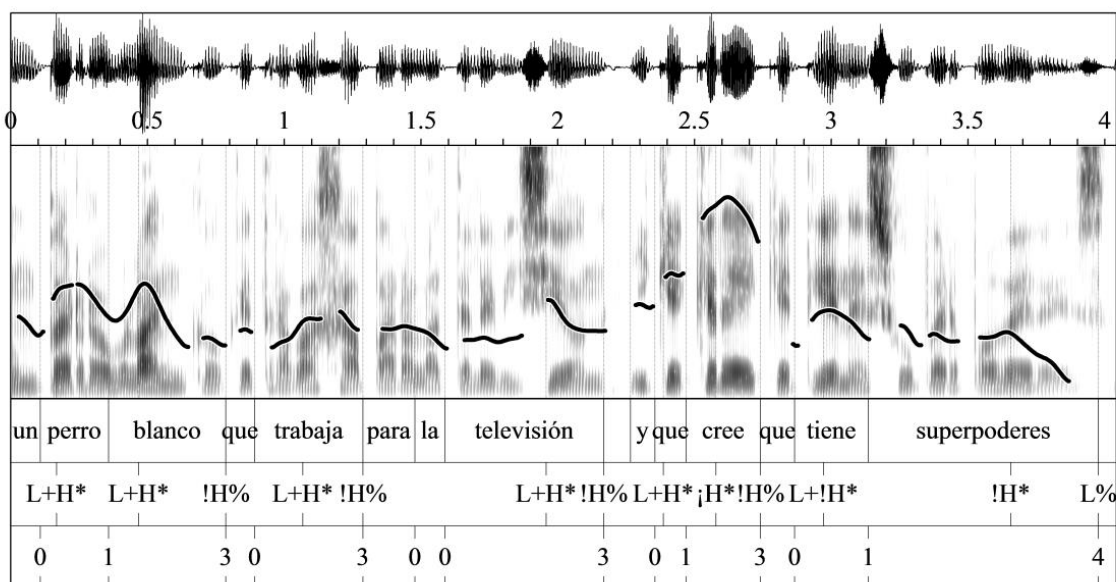


Figure 3. Waveform, spectrogram and F0 trace for the statement [...] *un perro blanco que trabaja para la televisión y que cree que tiene superpoderes* ' [...] a white dog who works for television and who believes he owns a superpower' produced with five IPs. IP1-IP4 end in !H%, and IP5 ends in L%.

The last IP in the long utterance *es un perro blanco que trabaja para la televisión y que cree que tiene superpoderes* 'it's a white dog that works for television and that believes it has a superpower' exhibits a falling pitch movement from the last accented syllable *-de-* in *superpoderes* to the end of the utterance, !H\* L%. The remaining IPs all exhibit a fall-to-mid pitch, H\* !H%.

- (4)
- |                                   |     |
|-----------------------------------|-----|
| IP1: “ <u>Bolt</u> ”              | !H% |
| IP2: “es un perro <u>blanco</u> ” | !H% |
| IP3: “que <u>trabaja</u> ”        | !H% |
| IP4: “para la <u>televisión</u> ” | !H% |

IP5: “y que <u>cree</u> ”	!H%
IP6: “que tiene superp <u>oderes</u> ”	L%
IP7: “aunque más <u>bien</u> ”	!H%
IP8: “es un anti <u>héroe</u> ”	L%

IP7 and IP8 are not included in the above figure, but we have added them here as part of the context for our analysis. They also display !H% and L%, respectively.

At the discourse level, the news reader resorts to !H% (IP1- IP5) in order to signal the following operation: their propositional content is to be processed as a set of features about the starring character, all of which build up a list whose end is signalled by L%, once IP6 is reached. At this stage, the hearer can access a cognitive image of the dog in this movie, and consequently, she can achieve cognitive effects.

At the linguistic level, every time the news-reader resorts to !H%, he instructs the hearer to label the information in its IP as background, except for the case of IP6, which he brings to the foreground via L%. This boundary tone choice leads the hearer onto the first assumption, that Bolt is a genius. Subsequently, !H% in IP7 signals the addition of its information to the background, and that the process towards another piece of discourse has begun. By using L% in IP8, the news-reader’s intention is for the hearer to complete the dog’s image, but now, also as a loser. This is foreground information, too.

This alternation of the paired sequence of !H% and L% may count as a strategy that the news-reader uses to complete dramatically the presentation of contrastive information concerning the opposing qualities of Bolt: on the one hand, as a super entity, and on the other, as a failure. Obviously, in parallel, there is also an effect at the discourse level, whereby the initial image of Bolt has drastically changed in the hearer’s mind, resulting in the achievement of new cognitive effects.

Let us now turn to a token representative of numerous cases in our corpus which includes a set of IPs with H% and =%; these are further down in this same piece of news. Specifically, figure 4 illustrates a token of two rising intonation contours at the end of IP1 and IP2 with H%, followed by IP3 ending in high-sustained pitch, L+H\* =%.

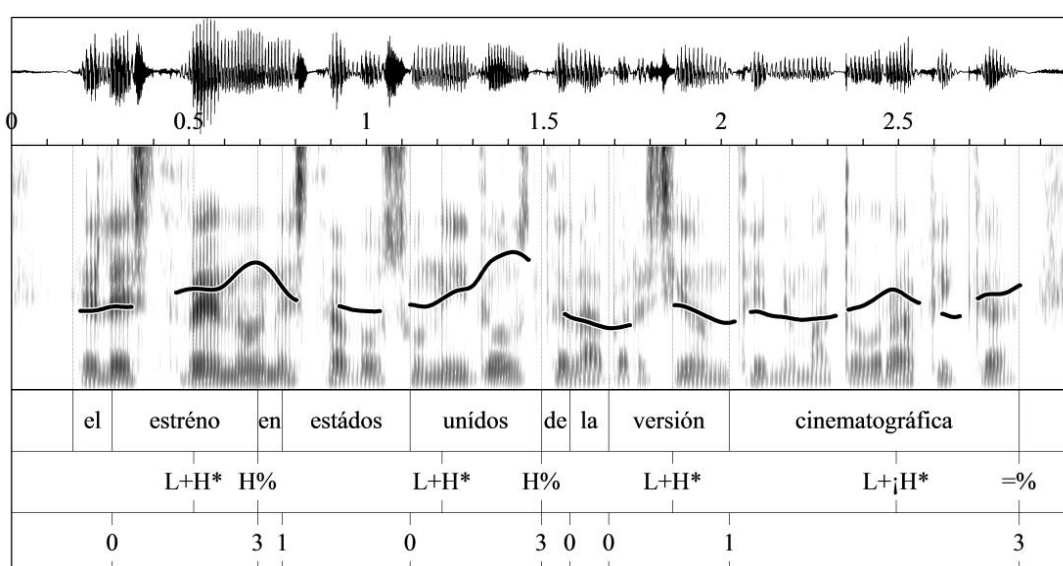


Figure 4. Waveform, spectrogram and F0 trace for the statement *El estreno, en Estados Unidos, de la versión cinematográfica [...] ‘The premiere, in the US, of the movie version [...]’* produced with three IPs. IP1 and IP2 end in H%, and IP3 ends with L+H\* =%.

(5)	IP1: “El estreno” ‘the premiere’	H%
	IP2: “en Estados Unidos” ‘in the United States’	H%
	IP3: “de la versión cinematográfica” ‘of the movie version’	L+;H* =%
	IP4: “superó en taquilla” ‘surpassed in ticket sales’	!H%
	IP5: “a la última de James Bond” ‘James Bond’s last movie’	L%

Here, at the discourse level, the instruction transmitted via H%, =% and !H% in IP1-IP4 is something which could be paraphrased as ‘this information contributes to the on-going process towards relevance’. L% in IP5 signals that the process culminates and the hearer holds all the necessary information to interpret the intended message at a small cost.

As far as the orientation towards the linguistic message is concerned, IP1 and IP2 share the same interpretation: their contents belong to the background, only that they are being reactivated. The matter in IP1, *the premiere*, was mentioned earlier in PU1, and *the United States* in IP2 was implicitly referred to in previous IPs in the piece of news, which mentioned entities belonging to that nation, such as the Disney factory, comics strips, and ‘Twilight’, the film based on the North American novelist Stephanie Meyer. IP3 exhibits =%, whose interpretation, according to Estebas-Vilaplana *et al.* (2015), is that of H%, since it is clearly perceived as relatively high pitch as indicated by the presence of H in the nuclear accent, L+H\*. Consequently, the information in IP3 is interpreted as a reactivation of background, too. In fact, this piece of news began with a PU whose information was about the Christmas movie-shows, so the referent of *de la versión cinematográfica* is a matter already part of the context<sup>7</sup>. IP4 introduces another point about the aforementioned ‘Twilight’, which is to be added to the background. The issues in IP1-IP4 are fully interpreted once IP5 is produced with L%, and its own propositional content is foreground.

## 7.2. Discourse, linguistic, and socio-cultural pragmatic interpretations of =%

A matter of concern we must address at this point is the following: what is the news-reader’s intended interpretation of =%? In other words, why does he resort to sustained high level pitch in (5) above, instead of, for instance, a high-rise pitch movement? From our analysis thus far, it is clear that such a tone, like H%, has an effect on the status of the information at the linguistic and discourse levels. However, unlike H%, we wish to claim intuitively that =% adds a nuance which could be paraphrased as ‘I’m still adding further information for you to process, and I am not quite finished yet’. If we assume this to be the case, notice that here there is a hint towards politeness on the speaker’s side which could be further paraphrased as ‘while I am still feeding you with information, I am aware that you still cannot reach cognitive effects, but it will soon be over; bear with me a little while longer’. Underlying such an interpretation stands Escandell-Vidal’s (1996) view of *politeness*. This is a cover term for the set of assumptions culturally defined in a community to satisfy the expectations of social adequacy and behaviour. Within this framework, then, we would like to suggest that =% contrasts with H% in terms of the activation of the nuance *politeness*. Hence, in (5), IP3, *de la versión cinematográfica* L+H\* =%, differs from IP2, *en Estados Unidos* H%, in the presence versus absence of the news reader’s intention to express politeness due to the delay of the ongoing reactivation process.

If we assume this to be true, then, we could predict that =% also contrasts with the rest of the boundary tones, !H% and L%, in a similar fashion: sustained pitch activates the socio-cultural interpretation of politeness in

<sup>7</sup> We shall return to this token below in section 7.2, where we analyse in greater detail the interpretations of =% at the socio-cultural level.

Spanish read-news speech, while the tunes ending in non-sustained pitch activate the discourse and linguistic interpretations in the same monological type of speech.

Let us now turn to another token, which is richer in boundary-tone choices, and whose analysis will shed some new light onto understanding better the interpretations of =%. Here, we present a three-way contrast: L+H\* =%, L+H\* !H% and !H\* =%.

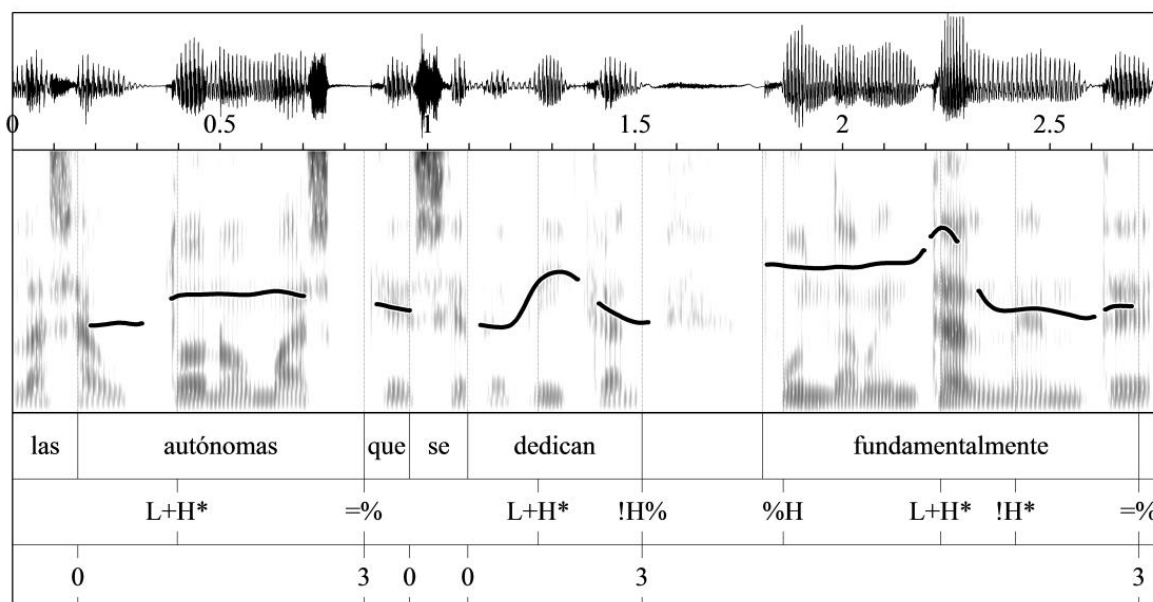


Figure 5. Waveform, spectrogram and F0 trace for the statement [...] las autónomas que se dedican fundamentalmente [...] ‘[...] the autonomous ones, who are devoted mostly to [...]’ produced with three IPs. IP1 and IP3 end in =%. Such a boundary tone is preceded by H\* and !H\* respectively; IP2 ends in !H%.

- (6)
- |  |          |
|--|----------|
| IP1: “y por otro”, ‘and on the other hand’         | !H%      |
| IP2: “las <u>autónomas</u> ” ‘the autonomous ones’ | L+H* =%  |
| IP3: “que se <u>dedican</u> ” ‘who are devoted’    | L+H* !H% |
| IP4: “ <u>fundamentalmente</u> ” ‘most of them’    | !H* =%   |
| IP5: “a la <u>hostelería</u> ” ‘to hotel industry’ | !H%      |
| IP6: “o al <u>comercio</u> ”. ‘or commerce’        | L%       |

In this piece of news<sup>8</sup>, we are informed about the latest figures published by the Commission of Women and Enterprises related to the percentage of women who are self-employed, and also about their different profiles. In this PU, we are told specifically about a second female profile: self-employed women who work mostly for the hotel industry, or commerce.

Notice that IP2 exhibits high pitch, L+H\* on the tonic syllable, and later it remains sustained up to the end of the IP, =%. Similarly, IP4 shows mid pitch !H\* from the nuclear syllable to the end of the IP, =%. As far as the orientation towards the linguistic message is concerned, the sequence L+H\* =% in IP2 is interpreted as a reactivation of background information, since the hearer was informed from the first PUs in the piece of news about there being 1 million women who work autonomously, and !H\* =% in IP4 is understood as an addition of

<sup>8</sup> This is extracted from news sp-m09a-prn09.

the issue in its IP to background. At the discourse level, their contents contribute to the on-going process towards relevance. But are there any other reasons for using sustained pitch here?

Before offering an answer, we should refer to another phonetic factor which we have observed occurring simultaneously with sustained pitch: news readers slow down their speech rate, and they show a noticeable tendency towards lengthening the tonic and post-tonic syllables. In view of these phonetic cues, we wish to propose that news readers are unconsciously aware that they are adding and reactivating a good deal of information, thus increasing the amount of knowledge in background, and subjecting their hearers to a considerable cognitive effort in their processing of all the information, until an IP with L% is reached, and only then does every individual piece of information make sense. Following the line of argument we set already in the analysis of (5), and in order to answer the above question, we suggest that the phonetic events, represented phonologically as =%, stand as the manifestation of the news readers' unconscious intention to show deference or politeness towards their hearers, and themselves, too, since the former are assumed to be in the complex process of interpreting the piece of news while, at the same time, delivering it to the latter. To sum up, we propose that =% stands as the phonological correlate of the reader's wish to transmit politeness towards himself and towards the hearer, and that the socio-cultural orientation of intonation in communication is, thus, encoded.

### 7.3. Towards the formalisation of the interpretations of =%

In order to formalise the proposal we put forward in this paper, three crucial matters need to be addressed and sorted out: firstly, is it always the case that the interpretations of the multiple levels of sustained pitch (H, !H and L) remain constant when they are manifested via =% at the discourse and linguistic levels? Notice that the tonal system predicts tunes like, for instance, (H+)L\* =% to be consistent with our description thus far; in this particular phonological string, =% is interpreted as L% at the discourse and linguistic levels: discontinuity and *foreground*, respectively. However, in Estebas-Vilaplana *et al.* (2015) sustained low pitch transmits a sense of continuity and *background* at the discourse and linguistic levels, as this tonal sequence seems to be limited to non-final clauses with the sense of incomplete information. How can these apparently opposing views be reconciled in order to achieve a one-way mapping between tunes and interpretations?

Secondly, how is the concept of *politeness* to be understood? As far as the greatly influential rational view in Brown and Levinson (1987) and followers is concerned, *politeness* is understood as the use of a series of signs by a given speaker in order to show deference or respect to his/her interlocutor, and thus, avoid face-threats. This approach is more functionally oriented. An alternative approach, with a clearer cognitive orientation, is put forward in Escandell-Vidal (1996), a seminal piece of research within the framework of RT, which, in short, advocates that *politeness* is part of the knowledge human beings own as members of a socio-cultural community, i.e., a culturally-defined set of assumptions which is automatically activated in communication, and fulfils the expectations of social adequacy and behaviour. Bearing in mind these two complementary approaches of *politeness*, we wish to offer a strong bid in support of =% as the procedural instruction to process the information in its IP as complying with the socio-attitudinal and cultural constraints pertaining to politeness in read-news speech in Spanish.

The third issue concerns the following: it has been well attested for Spanish utterances (Roseano and Prieto, 2010) that both declarative and interrogative sentences can express politeness by means of the exhibition of various pitch inflections, such as (L+)H\* L% (a falling pitch movement), or L\* !H% (a low-rise to mid pitch). If speakers resort to these tones to express politeness, what are the reasons, if any, to select =% as yet another tonal alternative?

As far as the first issue is concerned, unfortunately, we still have not encountered phonological strings such as (H+)L\* =% in the read-news corpus<sup>9</sup>, but recall that according to Estebas-Vilaplana *et al.* (2015), there are clear instances of its occurrence in the dialogue corpus of *Glissando*. The case in point is the one illustrated in their figure (6), and reproduced here for ease of reference in Figure 6<sup>10</sup>.

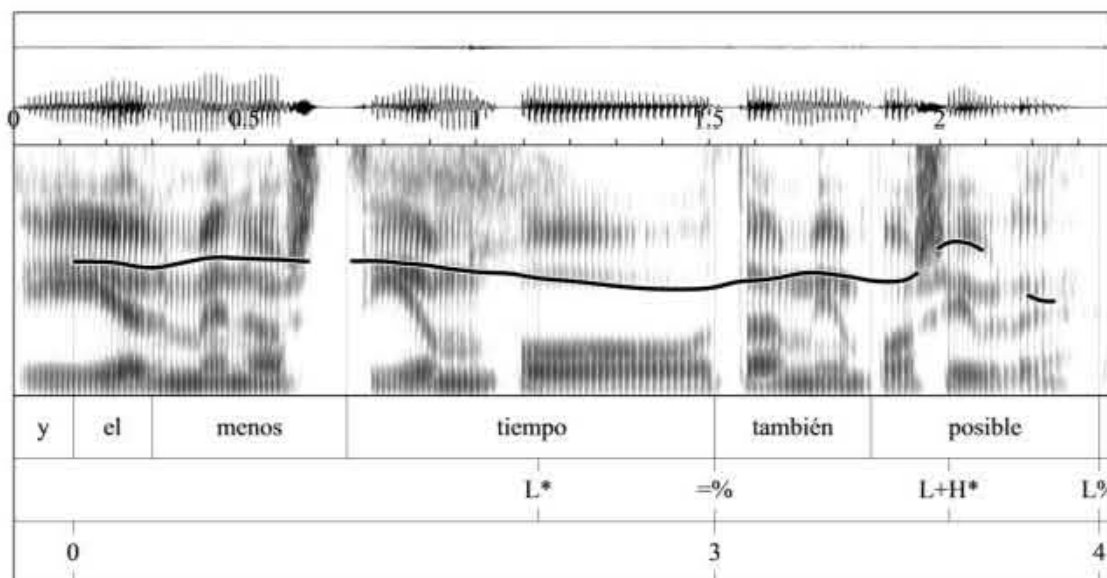


Figure 6. Waveform, spectrogram and F0 trace for the statement [...] y el menos tiempo también posible [...] and the shortest time also possible' with two IPs. IP1 ends in =% and IP2 in L%.

In this dialogue, a male speaker who performs the role of a customer, requests for information about the most convenient way to travel from Ávila to Ciudad Real (both towns in Spain). He does this slowly, and with a clear set of IPs with sustained pitch whose final words are lengthened. After he has offered a few details about his journey, another male speaker, who performs the role of a travel agent, asks him whether he has any preferences about means of transport, either train or coach. Our customer replies straight away that he has no preferences, and as soon as he utters this, he seems to change his mind, and states that he would like to travel on a non-stop means of transport, and in the shortest time possible. The travel agent can be heard humming during the customer's breaks. In this context, the customer's utterances are the following:

- (7)
- |      |   |         |
|------|---|---------|
| IP1: | “me gustaría lo más directo que” ‘I’d like it to be non-stop’ | L* =%   |
| IP2: | “fuese posible” ‘possible’                                    | L* !H%  |
| IP3: | “y el menos tiempo” ‘and the least time’                      | L* =%   |
| IP4: | “también posible”. ‘also possible.’                           | L+H* L% |

As can be observed in (7), both the syntactic structure and the propositional contents of IP1 and IP3 are incomplete, and they are respectively completed in IP2 and IP4. In the first pair, *lo más directo que* (*lo* refers to the means of transport in the situational context) constitutes part of the complex noun phrase (NP) subject *lo más directo que fuese posible*, which agrees in singular with the verb *gustaría*. In the structure of this NP, *más*

<sup>9</sup> We are grateful to an anonymous reviewer for their insightful comments about the socio-cultural interpretation *politeness* of %, which has lead us onto further investigation of the read news corpus in search of independent evidence to support this proposal.

<sup>10</sup> This dialogue is coded as *spm09a-m10a-trd* in the set of dialogues about transport.

*directo que fuese posible* is a modifier of the pronominal head *lo*. Such a modifying element is split by the speaker into two separate word-groups; the first is part of IP1 and ends in sustained low pitch (L\* =%), and the second is included in IP2, and ends in a low-rise to mid pitch, L\* !H%. This division of the syntactic construction correlates with that of the propositional content into IP1 and IP2: it is not until the end of IP2 that we begin to understand the idea expressed by the speaker. In the second case, the speaker also splits his utterance up into two IPs the syntactic structure of the conjoined verbless clause *y el menos tiempo también posible*; thus, IP3 contains *y el menos tiempo*, which is the NP subject of the conjoined clause introduced by *y*, while IP4 includes *también posible*, which is the predicate lacking the same verb form *fuese*. The intonation contour in IP3 ends in sustained low pitch, L\* =%, while IP4 ends in falling pitch L+H\* L%. Similarly to what we have just described in the sequence of IP1 and IP2, the propositional content of IP3 remains incomplete here until IP4 is uttered. Given the incomplete status of the information in IP1 and IP3, Estebas-Vilaplana *et al.* (2015) defend that =% is to be interpreted as continuity at the discourse level, and they further support their proposal with the fact that it also correlates with the IPs' respective incomplete syntactic structures.

If we endorse this analysis in the present paper, notice that we run the risk of partially contradicting what we have proposed so far, that is, =% shares the pragmatic interpretations of H%, !H% or L% depending on the presence of H(\*), !H(\*) or L(\*) in the last position of the nuclear tone. Given the assumption that =% adopts the pragmatic value of L% by virtue of there being L(\*) as part of the nuclear tone, its interpretation at the discourse level is 'the process of relevance is complete', and consequently, it signals a discontinuity in the cognitive process. This is the view we shall push forward below.

But before we can decide whether or not we should adopt the seemingly counterintuitive analysis in Estebas-Vilaplana *et al.* (2015), we must turn to a more detailed analysis of (7). A closer inspection of the interpretations of IP1 and IP3 at the linguistic level indicates that both of them are *foreground*, as they include the specific information that the travel-agent requested from his customer in order to begin the search for the best travelling offer. Thus, their linguistic interpretations are congruently signalled by the adopted value of =% as L%. If this is the case, we might be better off if we pursue our systematic view: given the fact that at the linguistic level =% embraces the interpretations of L%, then, at the discourse level, the situation should remain constant; consequently, in the sequence L(\*) =%, the boundary tone is to be interpreted as 'the process of relevance is complete'.

Even if this is so, the authors of the present paper insist on the fact that they still perceive a nuance different from the one interpreted by L%, as advocated in Estebas-Vilaplana *et al.* (2015), something which could now be paraphrased as 'I'm delaying the process towards relevance as I'm giving information which just occurred to me, but which contributes to fulfill your request', or 'I'm reaching the end of the process towards relevance, but let me share this information with you'. So, in the light of all this analysis, and until more definitive evidence from perception tests and dialogical speech is offered in future research, can we establish what is the contrast between =% and the other boundary tones?

The answer to this question has been gradually put forward in this section at the same time as we have presented tokens of our corpus. We propose that =% activates the socio-cultural interpretation of *politeness* in Spanish read-news speech. Thus, we wish to claim that by means of the phonological string L(\*) =% in (7), the socio-cultural interpretation is activated, and it seems to 'weaken' (but not cancel) the strength of the interpretation at the discourse level. Pragmatically, this could be understood as follows: =% in the Spanish declarative sentences found in news-reading speech can function as a device that activates *politeness* at the socio-cultural level, while at the same time, it can mitigate (but not cancel) the interpretations oriented towards the discourse and linguistic levels.



In relation to the third issue mentioned above, whereby we questioned the need of three different tones for encoding politeness, we are now in a position to offer a positive answer: given the evidence we have gathered, %= stands as a marker of politeness in read news speech style, while L% and !H% behave as markers of politeness in dialogical speech. This has been attested already in, for instance, Vizcaíno-Ortega and Cabrera-Abreu (2012) who argue that wh-interrogatives (for example, “¿Cuánto le debo?” ‘How much do I owe you?’) with the sequence L\* !H% are interpreted by Canarian speakers of as polite questions. Furthermore, López-Bobo and Cuevas-Alonso (2010) describe the phonological string L+H\* L% in declarative utterances by Asturian speakers of Spanish as the intonation device to signal a polite request (for instance, “Rellenen este formulario” ‘Fill-in this form’). Thus, the point we put forward in this paper is the following: depending on the speech-style, and therefore, on their contextual situation, speakers resort to different boundary tones to signal politeness. In the case of monological speech, in which the speaker relies solely on his/her oral linguistic strategies to communicate a message, sustained pitch stands as the only vehicle to manifest politeness, while non-sustained pitch correlates primarily with the linguistic and discourse interpretations of the propositional content of its IP. In this sense, we may claim that speakers resort to sustained pitch to signal interpretations at the socio-attitudinal level. Meanwhile, in dialogical speech, both sustained low pitch and non-sustained pitch have been attested as intonation devices to express politeness.

In the following table, we spell out the distribution of tones as they have been attested in either monological or dialogical speech from the perspective of their expression of politeness.

Politeness	Speech style	Tones	H%	!H%	L%	=%			
						H	!H	L	
				Last tone in the nuclear accent					
	Monological speech					✓	✓		
	Dialogical speech			✓	✓				✓

Table 1. Distribution of boundary tones and occurrences of politeness in monological and dialogical speech.

The contrastive interpretations manifested at the attitudinal and socio-cultural levels via sustained and non-sustained pitch are productive to the extent that a tune selected by a given speaker on a particular occasion can inform about the *orientation of politeness*. By such term, we understand the following: in the same way as, in a speech act, a speaker can direct a message to a hearer (to other), or both to a hearer and the speaker himself (to both), the intended politeness of the message can point to a hearer, or both to a hearer and a speaker. In the case of sustained pitch, we wish to claim that *politeness* is directed towards both the speaker and the hearer, as the two of them benefit from extra processing time (recall that in our tokens from monological and dialogical speech we have attested extra duration of syllables and, consequently, extra time to process the message being conveyed). By contrast, non-sustained pitch in dialogical speech signals *politeness* oriented towards the hearer only, as he/she is the only one who benefits from the deference intended by the speaker.

To finish this section, we are now in a position to offer a complete view of the multilevel interpretations of boundary tones including their politeness orientations in the following table.

	Levels of interpretations	Tones			
		H%	!H%	L%	=%
Multilevel interpretations	Discourse level	Re-activation of information in on-going process	Add information to on-going process	Process towards relevance is fulfilled	As H, !H or L
	Linguistic level	Foreground (reactivation of background information)	Background	Foreground	As H, !H or L
	Attitudinal and socio-cultural level Politeness orientation: To other, to both	Unattested	To other (Wh-interrogatives)	To other (Gentle request)	To both

Table 2. Distribution of multilevel interpretations of boundary tones.

## 8. Conclusion

In this paper we have put forward a system of boundary tones that is both descriptively adequate and explanatorily powerful to account for the mapping of final intonation tunes with their interpretations at multiple linguistic levels (discourse, linguistic and socio-cultural), all of which contribute to an effective and polite communication between speakers and hearers.

The boundary tones H%, !H%, =% and L% are in charge of the pragmatic interpretations of Spanish declarative sentences in the read news speech style. We have defended the proposal that, while H%, !H% and L% are phonological targets specified for different relative pitch heights, =% is phonologically specified as sustained pitch and underspecified for its pitch level. In fact, we have argued that =% adopts its tonal height from the last tone in the nuclear accent (i.e. L\*, !H\* or H\*).

As far as the pragmatic interpretations of these boundary tones are concerned, we have identified three levels: the discourse level, the linguistic level, and the socio-cultural level. L% signals that the process towards relevance is fulfilled (discourse level), and that the propositional content of its IP is foreground at the linguistic level. !H% is interpreted as an instruction to add the information in its IP to the on-going process of relevance, and that its linguistic status is background. H% points at the reactivation of the contents of its IP in the undertaken process towards relevance; hence, the IP's contents are foreground. In relation to their contribution to the socio-cultural level, we have proposed that they stand as the vehicle to drive politeness in the communicative process, to the extent that they can even indicate its orientation. In this sense, we have defended the view that, in monological speech, high and sustained pitch are to be interpreted as politeness being oriented to both the speaker and the hearer; with respect to low sustained pitch, which was found in the dialogical speech of the same *Glissando* corpus by other researchers, its orientation is the same as sustained H and !H. Non-sustained pitch movements ending in either !H% or L% attested by other researchers in dialogical speech have been re-analysed in terms of our model, with the result that their politeness orientation has been to other (the hearer).

This detailed analysis shows that if we wish to reach a better understanding of declarative sentences both at the phonetic/phonological level and at the pragmatic level, we require an inventory of boundary tones rich enough to capture their variability, and a model broad enough to incorporate interpretations from the discourse, linguistic and socio-cultural levels so that, not just one, but a congruent set of interpretations can be mapped with their tunes.

We leave for future research to decide whether our proposal can be applied to other speech styles, or even, other languages. In this sense, the aim of the research would be two-fold: firstly, test whether the interpretations put forward at the different levels for the different boundary tones in the *Glissando* read news corpus are also present in other speech styles. Secondly, test the systematicity of our proposal, and if tendencies or generalisations are confirmed in other languages. Research of this kind would undoubtedly enrich the description of the boundary tones of Spanish and other languages within the theoretical framework of autosegmental-metrical phonology, and would also facilitate the comprehension of oral texts within the teaching-learning process of Spanish as a foreign language.

### **Declaration of conflicting interests**

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

### **Funding**

The author(s) received no financial support for the research, authorship, and/or publication of this article.

### **About the authors**

Mercedes Cabrera-Abreu is a Senior Lecturer in English Phonetics and Phonology at the University of Las Palmas de Gran Canaria. Her main research interests include contrastive analyses of the intonation of English and Spanish from an acoustic-phonetic and phonological perspective. Also, the intonation of Spanish together with its pragmatic meaning is one of the issues of her recent publications. Currently, she is researching in areas such as (a) learning Spanish intonation by speakers of British English, (b) Spanish and English discourse analysis - both textual and prosodic - and (c) historical pragmatics.

Francisco Vizcaíno-Ortega is a lecturer in English Phonetics and Phonology at the Department of Modern Languages, Translation and Interpreting, University of Las Palmas de Gran Canaria, Spain. His main research interests are the interface between prosody and pragmatic meaning, phonology and second language acquisition, and contrastive analyses of the intonation of English and Spanish from an acoustic-phonetic and phonological perspective. He also does research in Spanish intonation and Spanish and English discourse analysis.

### **Acknowledgements**

The authors are very grateful to Eva Estebas and Yurena Gutiérrez for their invaluable collaboration in earlier drafts of this paper, and to the anonymous reviewers for their insightful comments.

## References

- Aguilar-Cuevas, L., Cabrera-Abreu, M., Estebas-Vilaplana, E., Gutiérrez-González, Y. & Vizcaíno-Ortega, F. (2013). Convenciones para el etiquetado prosódico en el marco Sp\_ToBI del subcorpus de noticias de GLISSANDO. <<http://glissando.upf.edu>> [21/10/2021]
- Beckman, M., Díaz-Campos, M., McGory, J.T. & Morgan, T.A. (2002). Intonation across Spanish, in the Tones and Break Indices framework. *Probus*, 14, 9-36.
- Boersma, P. & Weenink, D. (2021). Praat: doing phonetics by computer. [Computer program]. Version 6.1.55). <<http://www.praat.org/>> [11/10/2021]
- Brown, P., & Levinson, S. C. (1987). *Politeness: Some universals in language usage*. Cambridge: Cambridge University Press.
- Cruttenden, A. (1995). Rises in English. In Windsor Lewis, J. (Ed.), *Studies in general and English phonetics. Essays in honour of Professor J.D. O'Connor (155-173)*. London: Routledge.
- Dabrowski, A. & Labastía, L. (2013). Prosodia y relevancia en el discurso: selecciones tonales y altura tonal en el español rioplatense. In Labastía, L. (Ed.), *Cuestiones de fonética, fonología y oralidad, Volúmenes temáticos de la Sociedad Argentina de Lingüística (71-88)*. Mendoza: Editorial de la Facultad de Filosofía y Letras de la Universidad Nacional de Cuyo. <<http://ffyl.uncu.edu.ar>> [10/09/2021]
- Escandell-Vidal, M.V (1996). *Introducción a la pragmática*. Barcelona: Ariel.
- Estebas-Vilaplana, E. & Prieto, P. (2008). La notación prosódica en español. Una revisión del Sp\_ToBI. *Estudios de Fonética Experimental, XVIII*, 263-283.
- Estebas-Vilaplana, E. & Prieto, P. (2010). Castilian Spanish. In Prieto, P. & Roseano, P. (Eds.), *Transcription of intonation of the Spanish language*. Munich: Lincom Europa.
- Estebas-Vilaplana, E., Gutiérrez-González, Y., Vizcaíno-Ortega, F. & Cabrera-Abreu, M. (2015). Boundary tones in Spanish declarative sentences modelling mid pitch. In The Scottish Consortium for ICPhS 2015 (Ed.), *Proceedings of the 18th International Congress of Phonetic Sciences*. Glasgow: University of Glasgow.
- Fretheim, T. (2002). Intonation as a constraint on inferential processing. In Bernard, B. & Marlien, I. (Eds.), *Proceedings of the First International Conference on Speech Prosody (307-310)*. Aix-en-Provence: ProSig et Université de Provence Laboratoire Parole et Language.
- Garrido-Almiñana, J.M. et al. (2013). *Glissando: a corpus for multidisciplinary prosodic studies in Spanish and Catalan*. In *Language resources and evaluation*. DOI10.1007/s10579-012-9213-0.
- Gutiérrez-González, Y. & Aguilar Cuevas, L. (2015). Nuevos datos empíricos sobre la entonación del español a partir del corpus de noticias *Glissando*. *Estudios de fonética experimental, Vol. 24*, 35-81.
- House, J. (1990). Intonation structures and pragmatic interpretations. In Ramsaran, S. (Ed.), *Studies in the pronunciation of English. A commemorative volume in honour of A.C. Gimson*. London: Routledge.
- House, J. (2006). Constructing a context with intonation. *Journal of Pragmatics*, 38(10), 1542-1558.
- Labastía, L. (2011). Procedural encoding and tone choice in Buenos Aires Spanish. In Escandell-Vidal, M.V., Leonetti, M. & Ahern, A. (Eds.), *Procedural meaning: problems and perspectives (383-413)*. Bingley: Emerald.
- Ladd, R. (1996). *Intonational phonology*. Cambridge: Cambridge University Press.
- López-Bobo, M. J. & Cuevas-Alonso, M. (2010). Cantabrian Spanish intonation. In Prieto, P. & Roseano, P. (Eds.), *Transcription of intonation of the Spanish language*. Munich: Lincom Europa.
- Pierrehumbert, J. (1980). The phonetics and phonology of English intonation. PhD thesis. Massachusetts: Massachusetts Institute of Technology.
- Prieto, P. (2014). The intonational phonology of Catalan. In Jun, S.A. (Ed.), *Prosodic typology 2. The phonology of intonation and phrasing (43-80)*. Oxford: Oxford University Press.
- Prieto, P. & Roseano, P. (Eds.) (2010). *Transcription of intonation of the Spanish language*. Munich: Lincom Europa.
- Sosa, J.M. (1999). *La entonación del español*. Madrid: Cátedra.
- Sperber, D. & Wilson, D. (1995). *Relevance: communication and cognition*. Oxford: Blackwell.

- Vizcaíno-Ortega, F. & Cabrera-Abreu, M. (2012). Relevance and attribution in the intonation of Gran Canaria Spanish interrogatives. *Journal of Pragmatics*, 44(10), 1219–1239.
- Wells, J.C. (2006). *English intonation. An introduction*. Cambridge: Cambridge University Press.
- Wilson, D. & Sperber, D. (2004). Relevance theory. In Horn, L. & Ward, G. (Eds.), *The handbook of pragmatics* (607–632). Oxford: Blackwell.
- Wilson, D. & Wharton, T. (2006). Relevance and prosody. *Journal of Pragmatics*, 38(10), 1559–1579.