

Mexican Spanish Intonation¹

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1. Introduction

The goal of this chapter is to describe the basic intonational tunes found in Central Mexican Spanish (México DF) and to present the inventory of nuclear pitch accents and boundary tones found in this Spanish variety using the Sp_ToBI labelling conventions proposed by Beckman et al. (2002) and later Estebas-Vilaplana and Prieto (2008). By establishing a labeled dataset of Mexican Spanish utterances which comprises the main intonation contours of this variety we will allow for further crossdialectal comparison among the tunes of several Spanish varieties.

Previous studies on Mexican Spanish intonation have described a variety of intonation contours from a phonetic and a phonological point of view (see Matluck 1951, Kvavc 1974, 1979, Sosa 1999, Prieto et al. 1995, Ávila 2003, Beckman et al. 2002, Martín Butragueño 2003a, 2003b, 2004, 2005, 2006a, Velázquez 2008a, 2008b, among others; see Martín Butragueño 2006b for a review). One of the most peculiar intonation contours seen in Mexican Spanish is the so-called ‘circumflex’ nuclear configuration (a term that describes the rising-falling contour that characterizes this intonation contour) These contours were described as early as Matluck (1951), later discussed by Quilis (1993) and Sosa (1999) and have been recently analyzed in depth in Martín Butragueño’s work (2004, 2006a, in press). Yet virtually no effort has been made to provide a complete inventory of pitch accents and boundary tones of the dialect, an inventory which must include a characterization of the F0 contours used for different pragmatic meanings (yet see Martín Butragueño 2006a and the DIME project at the DCC-IIMAS, UNAM, in López (2005), work on interrogatives by Ávila (2003), requests (Orozco 2008, 2010), adverbs (Mora, in press) and extrapredicative themes and discourse markers (Martín Butragueño 2003a, 2008)). In this chapter we would like to provide a further contribution to the description of Mexican Spanish intonation by examining new empirical data and typical tunes of several sentence types within the tenets of the Sp_ToBI framework (Hualde 2003, Sosa 2003).

As in all other chapters, the elicitation of the data was conducted in semi-spontaneous fashion through an established survey based on that proposed by Prieto

¹ The authors are indebted to the speakers Karla Yazmin Camacho Riquenes, Itzel Moreno Vite and Mercedes Orestano Sánchez. We warmly thank Itzel Moreno for her help with conducting the interviews and interpreting the meanings of the utterances. This study has benefited greatly from useful comments and questions received at the IV *Sp_ToBI workshop: Transcription of Intonation of the Spanish Language* (Las Palmas de Gran Canaria, June 2009). The presentation and associated sound files are available at <http://prosodia.uab.cat/home/ca/papi09.php>. This project has received the financial support of the Spanish Ministerio de Ciencia e Innovación in association with four projects: Glissando FFI2008-04982-C003-02, HUM2006-01758/FILO “Estructura prosódica y adquisición de la prosodia en catalán y español”, HUM2005-6980FILO “Estudio perceptivo de la variación inter e intralocutor en español” and CONSOLIDER-INGENIO 2010 “Bilingüismo y Neurociencia Cognitiva CSD2007-00012”.

(2001). In this methodology the subject was presented with a series of situations, each intended to elicit a particular type of utterance by an inductive method. The survey is designed to evoke everyday situations in which a wide range of intonation contours which are difficult to obtain in laboratory conditions are naturally produced. For instance, the speakers have to produce an utterance as a response to prompts like: “You enter the house of a friend of yours, Marina, to pick her up. But once inside, you can’t see her. So, call her name to see if she is there.” Or: “You have never been so cold in all your life. What do you say?” The survey elicits a variety of sentence-types (statements, yes-no questions, wh-questions, imperatives) that convey different pragmatic meanings (incredulity, confirmation, obviousness, etc.).

Three female native speakers from Mexico D.F. aged 27 and 28 with university degrees were recorded in a sound-treated room at the Universitat Autònoma de Barcelona using a PMD660 Marantz professional portable digital recorder and a Rode NTG2 condenser microphone. The interviews were conducted by a native speaker of the dialect (Itzel Moreno) and one of the investigators. A total of 204 sentences were obtained and an acoustic and perceptual analysis was carried out in order to perform the ToBI annotation. The results of the analysis were compared in Mexico with the production of a female Spanish speaker from Mexico D.F. aged 15 using a control interview. For each sentence, waveforms, pitch tracks and wideband spectrograms were displayed with Praat speech analysis software (Boersma and Weenink 2009) and then annotated manually using the Sp_ToBI labelling conventions, which are based on the first Sp_ToBI proposal (Beckman et al. 2002, Beckman et al. 2005) as well as its revised version (Estebas-Vilaplana and Prieto 2008).

The chapter is organized as follows. The central section presents the basic nuclear configurations found in Mexican Spanish intonational phonology for a variety of sentence types. Finally, last section concludes with a summary of the main findings and a chart of the basic nuclear configurations.

2. Mexican Spanish intonational phonology: nuclear configurations

This section describes the basic nuclear configurations found in Mexican Spanish within the Sp_ToBI framework. We consider broad and narrow focus statements, yes-no questions, wh-questions, imperatives and vocatives. Some of the non-neutral (biased) intonation patterns related to the elicited meanings and nuances obtained from the interviews are also discussed and exemplified with new empirical data. This will be done, for instance, with categorical statements, obviousness statements and invitation questions, among others.

2.1. Statements

2.1.1. Broad focus statements

Figure 1 shows the waveform, spectrogram and F0 pitch track of the broad focus statement *Ana tomó limonada* ('Ana had lemonade') produced with L+>H* prenuclear pitch accent followed by a L* L% nuclear configuration. The final low nuclear configuration in broad focus statements, common to other dialectal varieties of Spanish and to other Romance languages, although it is not the most frequent pattern in Mexican

Spanish, is also attested in this variety (Quilis 1993: 456, Prieto, Van Santen and Hirschberg 1995, Sosa 1999:195).

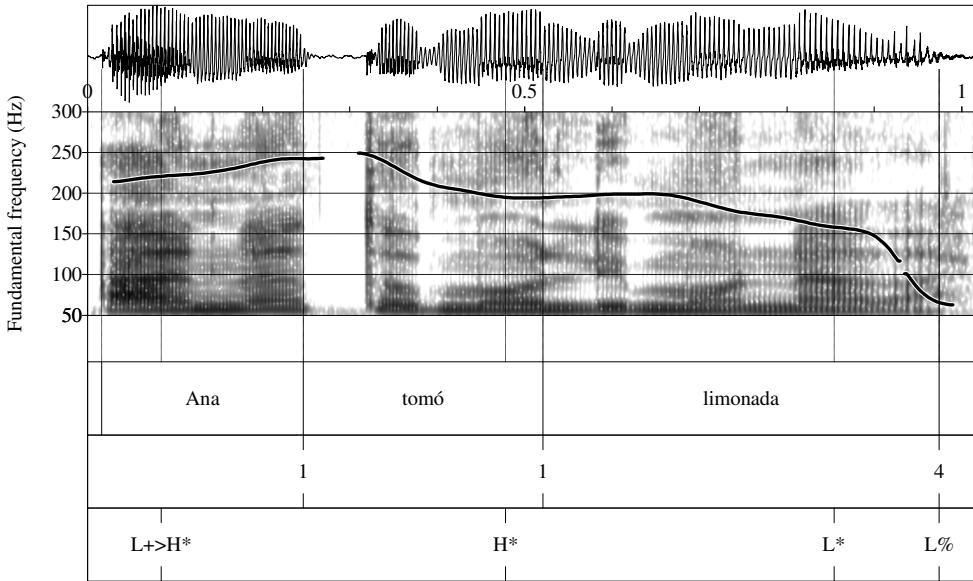


Figure 1: Waveform, wideband spectrogram and F0 pitch track of the broad focus statement *Ana tomó limonada* ('Ana had lemonade') produced with a L* L% nuclear configuration.

Prenuclear L+>H* rising pitch accents in Mexican Spanish have been studied in depth by Prieto, van Santen and Hirschberg 1995, Prieto, Shih and Nibert 1996 and Prieto 1998. Their results reveal that the L F0 valley is aligned near the onset of the stressed syllable and that the peak location depends on the position of the syllable within the utterance. In prenuclear accents the peak is not temporally aligned with the accented syllable but rather displaced forward. Although the rise starts with the stressed syllable, it usually ends in the post-tonic syllable (although the position depends on the right-hand prosodic environment). This delayed peak can be analyzed as a L+>H* pitch accent (Face and Prieto, 2007). These findings are also consistent with results from Castilian Spanish (Navarro Tomás 1944, Garrido, Llisterri, de-la-Mota and Ríos 1993, Llisterri, Marín, de-la-Mota and Ríos 1995, Llisterri, Machuca, de-la-Mota, Riera and Ríos 2003, de-la-Mota 1995, 1997, 2005, Face 1999, 2003). Moreover, there is a progressive lowering in broad focus sentences, also called downstep, whereby each peak usually falls to a lower F0 value than the preceding one.

Mexican Spanish also presents broad focus declarative utterances with a so-called circumflex final pattern. The circumflex pattern consists of a variety of contours with a rising pitch accent followed by lowering at the edge. Sosa (1999: 189) remarks that in Mexican Spanish this configuration can be related to declarative sentences without a particular narrow focus. In his analysis of La Puebla Mexican Spanish, Willis (2005) found that speakers used both patterns (circumflex and downward) in all contexts, although there were individual preferences. As Quilis (1993: 456) points out, this nuclear configuration is also attested in Gran Canaria and Puerto Rican Spanish.

The most common and prototypical cases of statement intonation found by Martín Butragueño (2004) in his analysis of sociolinguistic interviews end in L+;H* L% and

$L+H^* L\%$ (with a smaller rising), although there are also other configurations, namely, $L+jH^* L- H\%$, the absence of a fall after the tonal peak (shown as $M\%$, $H\%$, $H-$) and several other patterns, most of them downward $L^* L\%$. However, some of the circumflex patterns described earlier by Martín Butragueño for Mexican Spanish with data from sociolinguistic interviews were not attested in the corpus we used here. It is worth noting that the subjects who participated in our interview were all young urban women with master-level degree credentials and this might explain the differences found in circumflex configurations. Some configurations, such as $L+jH^* L- H\%$, might be less common among women, among speakers from a high social status and in formal speech (see Martín Butragueño 2004: 30 and 2006a: 28 for discussion). Taking into account data from men and women with different sociolinguistic profiles and ages, Martín Butragueño (in press) shows in a recent study that there are social differences in use and possibly a diachronic change in progress.

In our corpus of semi-spontaneous interviews, the use of circumflex configurations has been attested in both broad and narrow focus utterances. Figure 2 shows the $L+H^* L\%$ pattern observed in a broad focus declarative utterance. The final contour is a combination of a rising pitch accent with the peak aligned at the end of the stressed syllable followed by a falling movement to the $L\%$ edge tone.

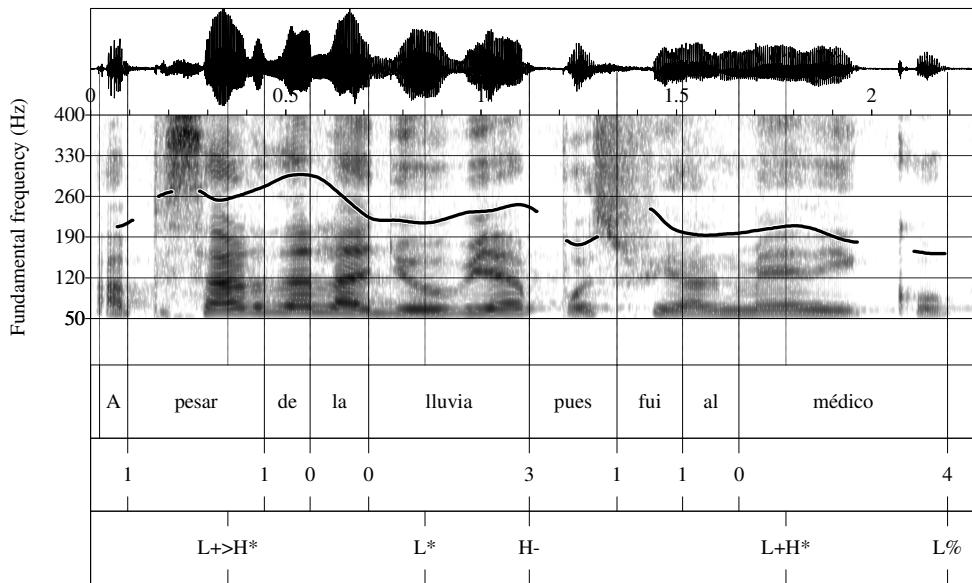


Figure 2: Waveform, wideband spectrogram and F0 pitch track of the broad focus statement *A pesar de la lluvia, pues fui al médico* ('I went to the doctor despite the rain') produced with a $L+H^* L\%$ nuclear configuration.

As we will see below, similar circumflex movements have been found in biased declarative utterances such as categorical sentences and statements of the obvious. Pragmatic correlates (as focal interpretation, the type of information and speaker commitment, among other factors) are related to the performed circumflex contours, which can be slight or really steep. Outstanding circumflexes like that on Figure 3 are relevant from the pragmatic and sociolinguistic point of view and the variation found in Mexican Spanish can be understood as an effect of a series of factors in a variationist way.

2.1.2. Categorical statements

In categorical statements the speaker strongly indicates that there can be no reservations about what it is said, since it is precise and known for certain. Figure 3 shows the waveform, spectrogram and F0 contour of the categorical statement *Yo estoy segura que se van a ir a Lima* ('I am sure that they are moving to Lima') realized with a L* HL% nuclear configuration. The low tone is temporally aligned with the stressed syllable, which is followed by a circumflex HL% edge movement realized in the posttonic syllable. Realizations with the peak aligned at the end of the accented syllable are also possible in Mexican Spanish, since there is a degree of variation due to subtle meaning differences.

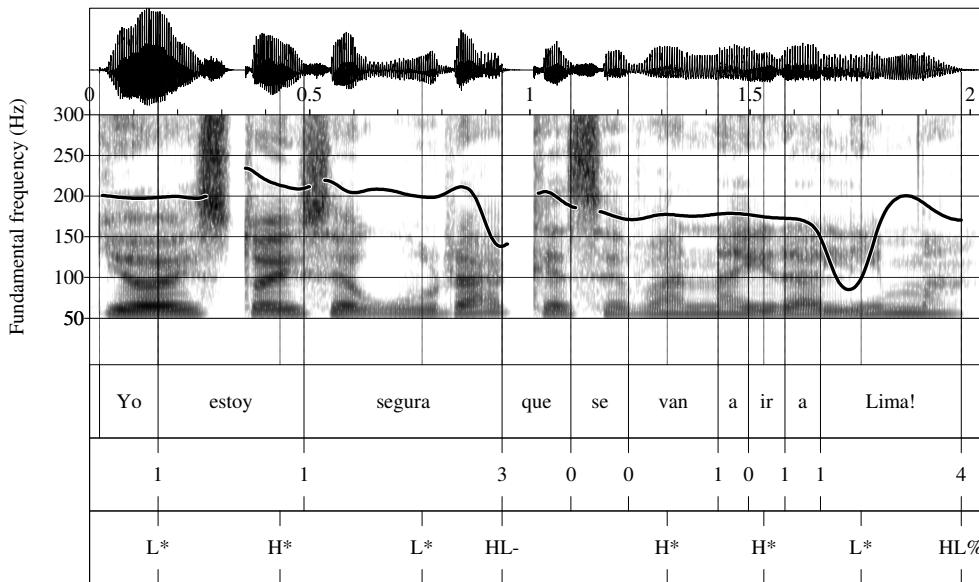


Figure 3: Waveform, wideband spectrogram and F0 pitch track of the categorical statement *Yo estoy segura que se van a ir a Lima* ('I am sure that they are moving to Lima') produced with a L* HL% nuclear configuration.

2.1.3. Obviousness statements

Figure 4 shows the waveform, spectrogram and F0 pitch track of the obviousness statement [*¿Cómo que de quién?*] *Pues... ¡de Guillermo!* ('Guillermo's, of course!') produced with a L+H* LM% nuclear configuration. This nuclear configuration is phonetically realized by a rising pitch accent associated with the accented syllable followed by a complex LM% boundary tone configuration. This type of pitch configuration expresses a strong conviction on the part of the speaker. This nuclear configuration is very common across Spanish dialects to express statements of the obvious (see Estebas-Vilaplana and Prieto, this volume, Armstrong, this volume, and others).

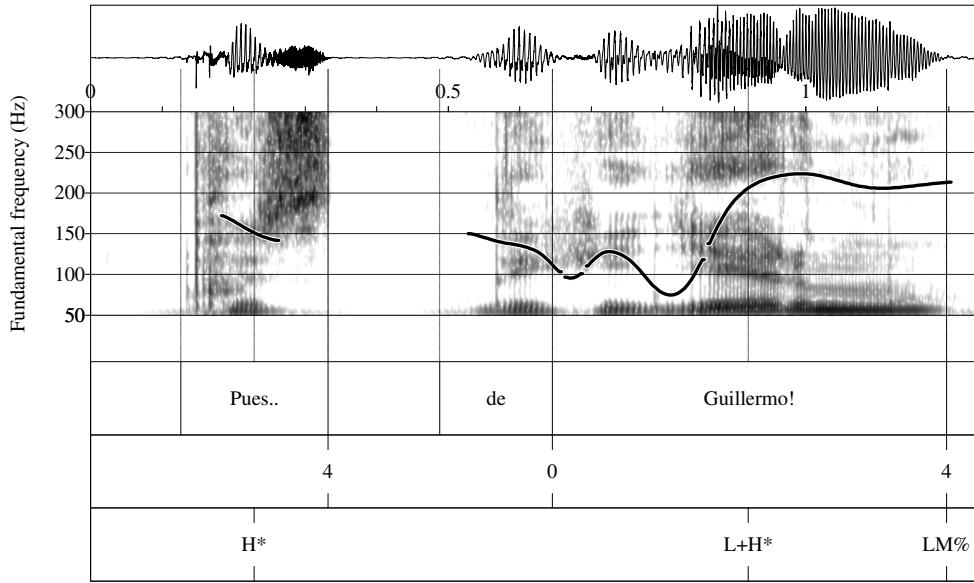


Figure 4: Waveform, wideband spectrogram and F0 pitch track of the obviousness statement [¿Cómo que de quién?] Pues... ¡de Guillermo! ('Guillermo's, of course!') produced with a L+H* LM% nuclear configuration.

2.1.4. Narrow focus statements

Words in narrow contrastive focus are highlighted in Castilian Spanish by using a pitch accent where the peak is reached earlier within the syllable than in broad focus sentences without a particular emphasis. Moreover, the pitch excursion is wide, so there is a difference in scaling, and there is also a longer duration and higher intensity (de-la-Mota 1995, 1997, Face 2002, Cabrera Abreu and García Lecumberri 2003). The pragmatic-informative value of these utterances can thus be distinguished by using such intonational cues. This circumflex movement has also been related in general to emphasis in Spanish (Navarro 1944: 164, Quilis 1993, Machuca and de-la-Mota 2006, and others).

In Mexican Spanish when the highlighted element is in final position the nuclear configuration is also L+H* L% (see Figure 5). This means that the peak associated with the last pitch accent is located before the end of the stressed syllable, usually aligned at the end, and afterwards falls to a minimum in the speaker's range. The focused element also seems to have a longer duration and higher intensity, since, as expected, the complexity of the movement is related to a longer duration (see Kim and Avelino (2003) and Martín Butragueño (2004) for Mexican Spanish). Notice that in Figure 5 the prenuclear pitch accent in *quiero* (*No, que quiero de LIMONES*) involves a rise with a delayed pitch. Some variation involving scaling can be found among realizations, probably due to differences in the emphasis degree.

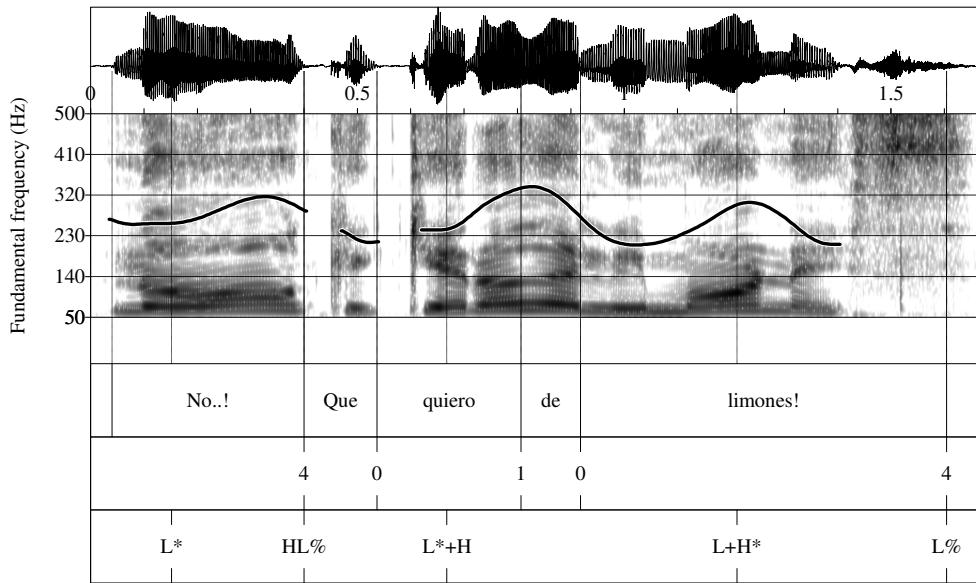


Figure 5: Waveform, wideband spectrogram and F0 pitch track of the narrow focus statement *No, que quiero de limones* ('No, I want LEMONS') produced with a $L+H^* L\%$ nuclear configuration.

2.2. Questions

2.2.1. Yes-no questions

Information-seeking yes-no questions in Mexican Spanish are usually produced with a high rise at the end of the utterance (Ávila 2003). Figure 6 shows the waveform, spectrogram and F0 contour of the information-seeking yes-no question *¿Tiene mermelada?* ('Have you got jam?'), produced with a $L^* LH\%$ nuclear pitch configuration. The last pitch accent is realized with a local pitch minimum L^* . This low tone continues into the posttonic syllable and then rises dramatically at the end of the utterance. Thus the sentence-final syllable is especially long to be able to contain the two targets belonging to the boundary tone $LH\%^2$. Quilis (1993: 471), Sosa (1999: 200-202) and Ávila (2003) also report a higher and longer final rise in Mexican yes-no questions.

² This complex boundary tone was proposed for Spanish by Díaz Campos and Tevis (2002), who worked on the analysis of a text read aloud by speakers of eight Spanish dialects and found that $LH\%$ boundary tones are often related in discourse to continuative-non-final situations, also in Mexican Spanish.

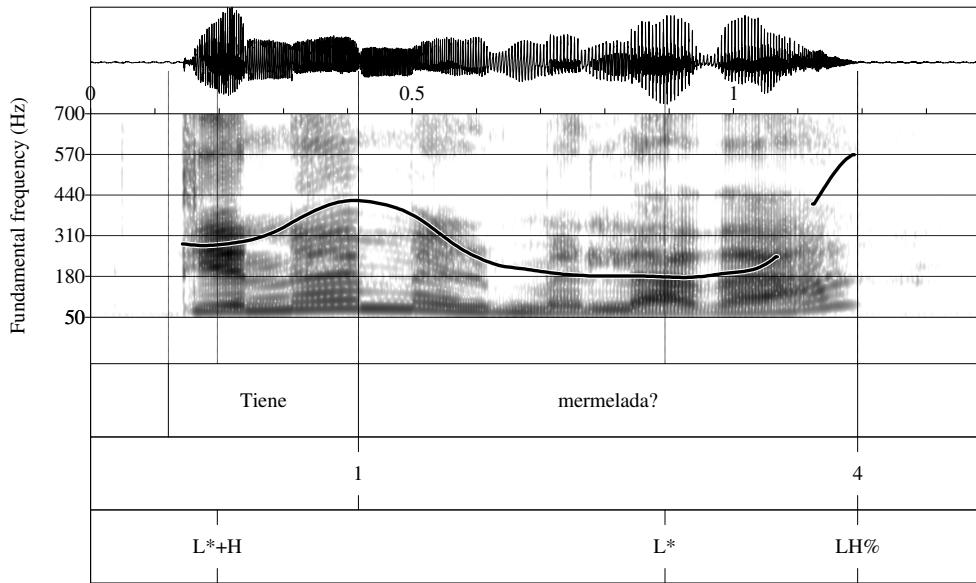


Figure 6: Waveform, wideband spectrogram and F0 pitch track of the information-seeking yes-no question *¿Tiene mermelada?* ('Have you got jam?') produced with a L* LH% nuclear configuration.

As in statements, prenuclear pitch accents in questions are commonly produced with a rising pitch accent L+>H*, with the H peak aligned with the posttonic syllable. This displacement has also been found in Castilian Spanish (Sosa 1999, Cantero 2002, Martínez Celdrán, Fernández Planas and Fullana Rivera 2003) and has been identified as L+>H* by de-la-Mota (2009) and Estebas-Vilaplana and Prieto (this volume).

Finally, for Mexican Spanish, other contours like the circumflex have been attested in such questions in previous works (Quilis 1993: 469, Willis 2005).

2.2.1.2. Incredulity questions

The nuclear configuration L* LH% is also attested in incredulity questions in Mexican Spanish, where the speaker shows incredulity and surprise about something that has happened or that had been stated before. This incredulity meaning is conveyed in the prenuclear accent by a low pitch aligned with the accented syllable and followed by a rise, i. e., by a L*+H prenuclear pitch accent. This contour is quite similar to the pattern found at the end of the utterance. The phonetic difference between the information-seeking and incredulity yes-no questions lies in the duration and pitch height of the boundary tones, which is higher in incredulity questions. This is the case of the sentence *¿Tienes frío?!* ('You're cold?!') shown in Figure 7.

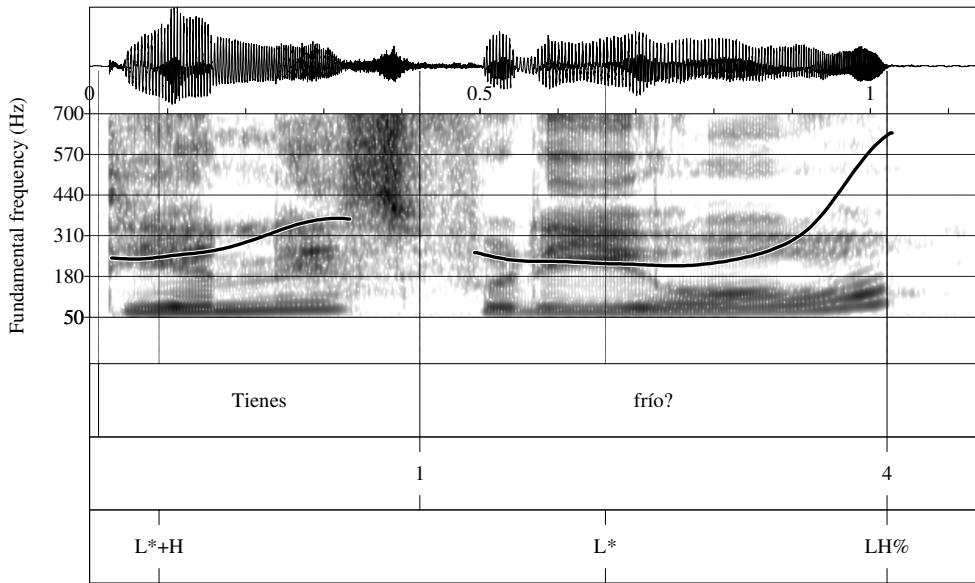


Figure 7: Waveform, wideband spectrogram and F0 pitch track of the incredulity question ¡¿Tienes frío?! ('You're cold?!) produced with a L* LH% nuclear configuration.

Figures 6 and 7 illustrate two types of interrogative sentences (information-seeking questions and incredulity questions) that use the same nuclear configuration L* LH%. Crucially, the utterance-final posttonic syllable rises to 415 Hz in the information-seeking question (Figure 6) but to 449 Hz (34 Hz more) in the incredulity question (Figure 7). There is also a significant difference in duration. The duration of the utterance-final vowel [o] in the incredulity question is 289 ms., while the duration of the final vowel [a] in the information-seeking question is just 216 ms. This is particularly relevant since [a] is considered to have a longer intrinsic duration than [o].

2.2.1.3. Imperative yes-no questions

Yes-no questions can also be used to express commands. Again, among other possible realizations, the imperative yes-no question contour can be realized by a L* LH% nuclear pitch configuration, that is, a low pitch accent followed by a final LH% rise. As it is shown in Figure 8, the highest pitch in the imperative yes-no question ¿Se pueden callar? ('Can you please shut up?') is associated to the prenuclear L+>H* pitch accent. The speaker reaches 561 Hz in the syllable -den, but just 496 Hz (65 Hz less) at the end of he utterance.

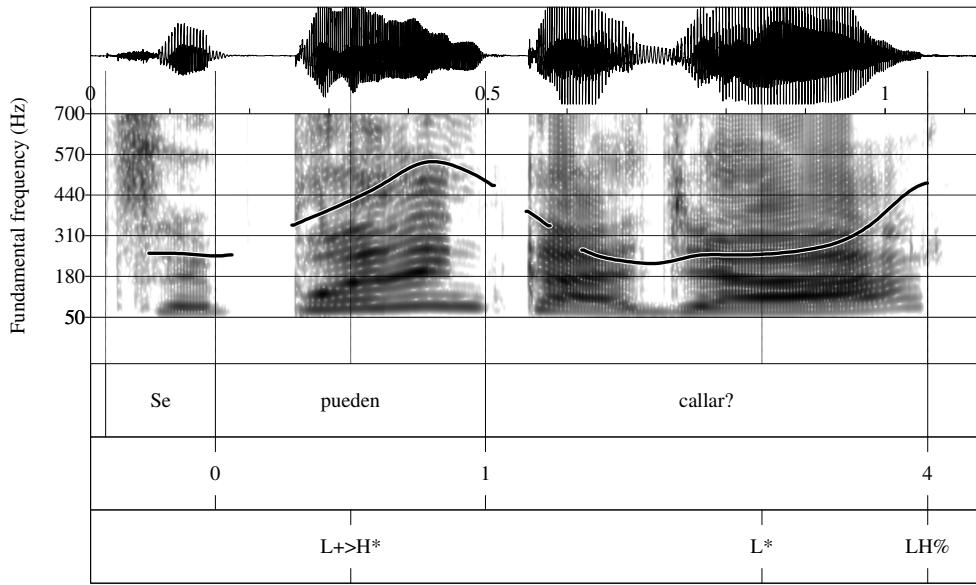


Figure 8: Waveform, wideband spectrogram and F0 pitch track of the imperative yes-no question *¿Se pueden callar?* ('Can you please shut up?') produced with a L* LH% nuclear configuration.

2.2.1.4. Invitation yes-no questions

Invitation yes-no questions are used to offer something to the listener and are expressed by means of a different intonation contour (see Thorson et al. 2009 for Peninsular Spanish). Figure 9 shows the waveform, spectrogram and F0 contour of the invitation yes-no question *¿Quieren caramelos?* ('Do you want some candy?') produced with a L* HH% nuclear configuration, which consists of a low tone during the stressed syllable followed by a high rise in the posttonic.³

³ Regarding the contrastive differences found in Castilian Spanish between H%, showing a weak rise, and HH%, with a higher pitch excursion, see Estebas-Vilaplana and Prieto (2008).

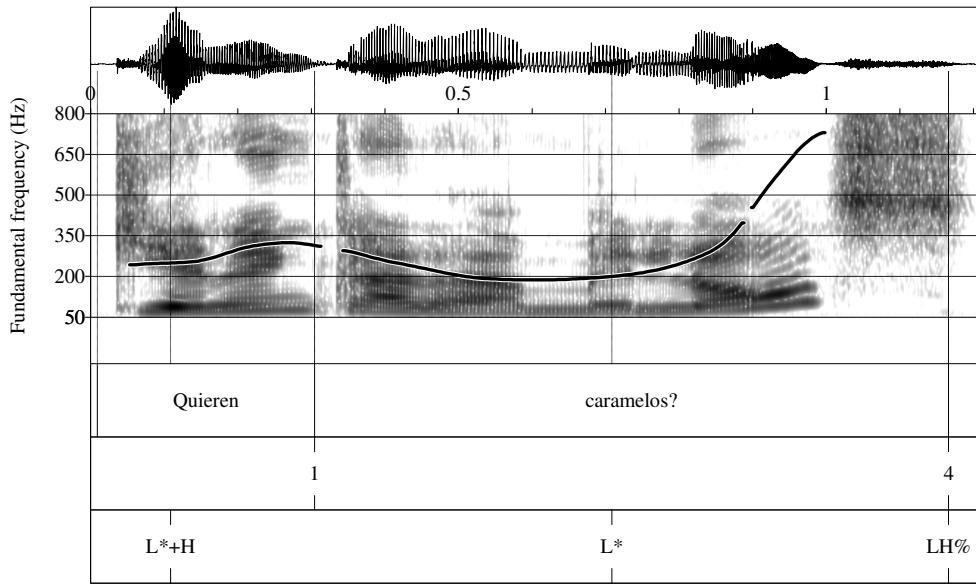


Figure 9: Waveform, wideband spectrogram and F0 pitch track of the invitation yes-no question *¿Quieren caramelos?* ('Do you want some candy?') produced with a L* HH% nuclear configuration.

Although in Mexican Spanish both invitation and information-seeking yes-no questions end in a high rise, the starting point of this rise seems to be important for distinguishing between the two meanings. While an early rise in L* HH% seems to indicate the invitation meaning, a late rise L* LH% is used for information-seeking questions. Interestingly, a similar kind of contrast has been found in Peninsular Spanish (see Thorson et al. 2009). In this variety invitation questions are produced with a L+H* HH% contour, with an early rise which starts at the beginning of the stressed syllable, while the “later” alignment is found in neutral yes-no questions, with a L* HH% configuration. Figure 10 shows a schematic F0 representation of the types of nuclear configurations found in invitation questions and information-seeking questions, in both Peninsular and Mexican Spanish. The diagram shows that the same configuration, in this case L* HH%, can be attested in both varieties but may be used for different meanings. Further perceptual experiments should be able to elucidate whether there is a categorical phonological contrast between these two types of contours.

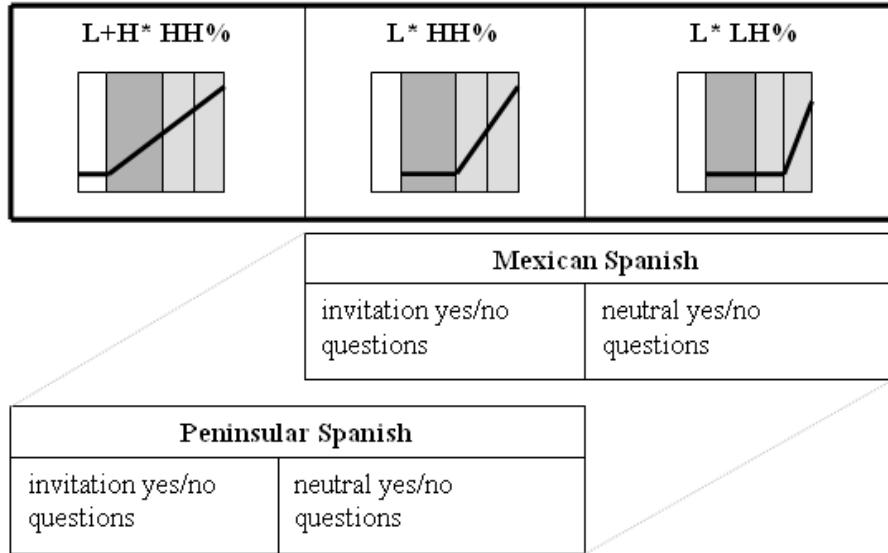


Figure 10: Schematic F0 representation of the types of nuclear configurations found in invitation questions and information-seeking questions in Peninsular and Mexican Spanish.

2.2.2. Wh-questions

2.2.2.1. Neutral wh-questions

As has been noted in previous studies, there is great variability in wh-questions, also in Mexican Spanish, since rising, falling and rising-falling patterns have been found (Quilis 1993, Sosa 1999, Ávila 2003, Orozco 2008, 2010). In this study, the most common F0 contour in wh-questions was produced with a circumflex contour: $L+H^* \text{ HL}%$. This nuclear pitch configuration consists of an F0 rise associated with the last stressed syllable which continues until the onset of the following syllable. After the peak, the pitch falls to a minimum in the speaker's range.

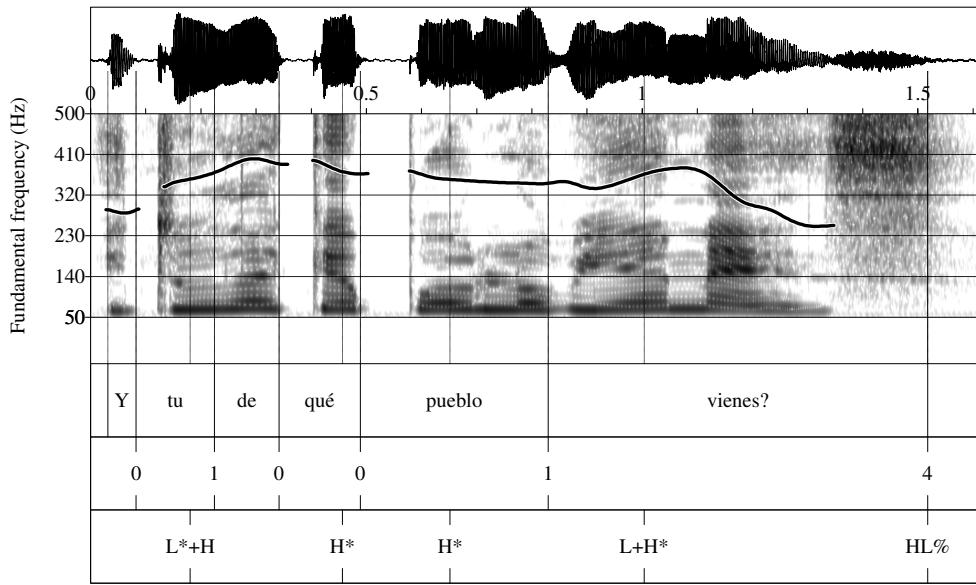


Figure 11: Waveform, wideband spectrogram and F0 pitch track of the neutral wh- question *¿Y tú de qué pueblo vienes?* ('And you, whereabouts are you from?') produced with a L+H* HL% nuclear configuration.

Other circumflex configurations have also been attested in biased wh-questions. Exclamative and imperative wh-questions are similar, since the meaning is achieved using the nuclear configuration L+H* L%.

2.2.2.2. Exclamative wh-questions

Exclamative wh-questions are similar to other emphatic constructions like narrow focus statements, where the L+H* L% configuration is also used (see Figure 12). The rising pitch accent L+H*, which can be realized with differences in scaling, is associated with the final stressed syllable, and the boundary tone is low.

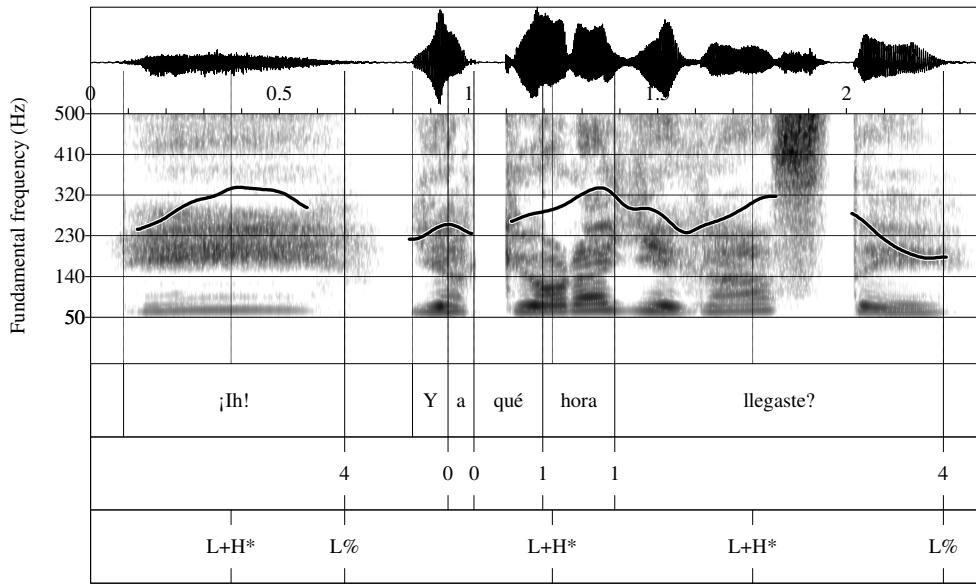


Figure 12: Waveform, wideband spectrogram and F0 pitch track of the exclamative wh- question *¡Ih! ¿Y a qué hora llegaste?* ('So what time did you arrive?') produced with a *L+H* L%* nuclear configuration.

2.2.2.3. Imperative and exhortative wh-questions

Figure 13 shows the waveform, spectrogram and F0 pitch track of the wh- question *¿Pero por qué no van a venir?* ('Why are **you** not going to come?') produced with a *L+H* M%* nuclear configuration in an exhortative context (trying to convince some friends). Presumably, the final *M%* tone in this configuration expresses the exhortative function. The end of the utterance can be lowered in the speaker range in some very exhortative realizations, with a drop in the local pitch register and even a creaky voice to mark the plea.

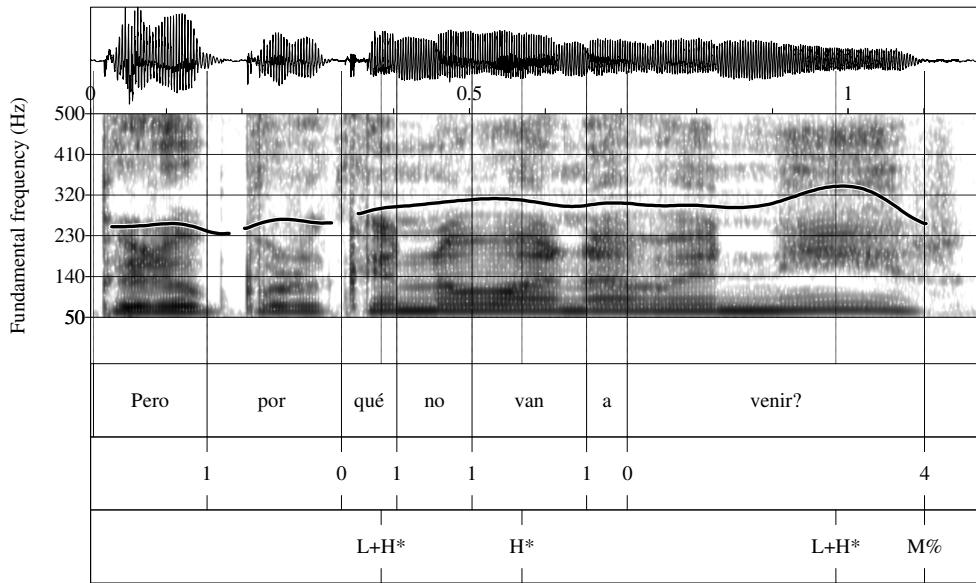


Figure 13: Waveform, wideband spectrogram and F0 pitch track of the exhortative wh- question *{Pero por qué no van a venir?}* ('Why are you not going to come?') produced with a L+H* M% nuclear configuration.

2.3. Imperatives: commands and requests

Although imperative utterances are understood as directive speech acts in which the speaker tries to induce the listener to do something, speakers can use different degrees of strength to express their objective, ranging from strong commands to gentle requests where the speaker uses a soft persuasive intonation. In Mexican Spanish, both commands and requests are produced with circumflex patterns, with different types of boundary tones (see also Orozco 2008, 2010). While in commands the falling movement triggered by the low boundary tone starts during the accented syllable, requests are produced using a bitonal HL% boundary tone, where the high tone is still associated with the posttonic syllable.

2.3.1. Commands

As in other Spanish dialects, the nuclear configuration used to express the command is L+H* L%. This is exemplified in Figure 14 with the utterance *Rellenen este formulario* ('Fill out this form').

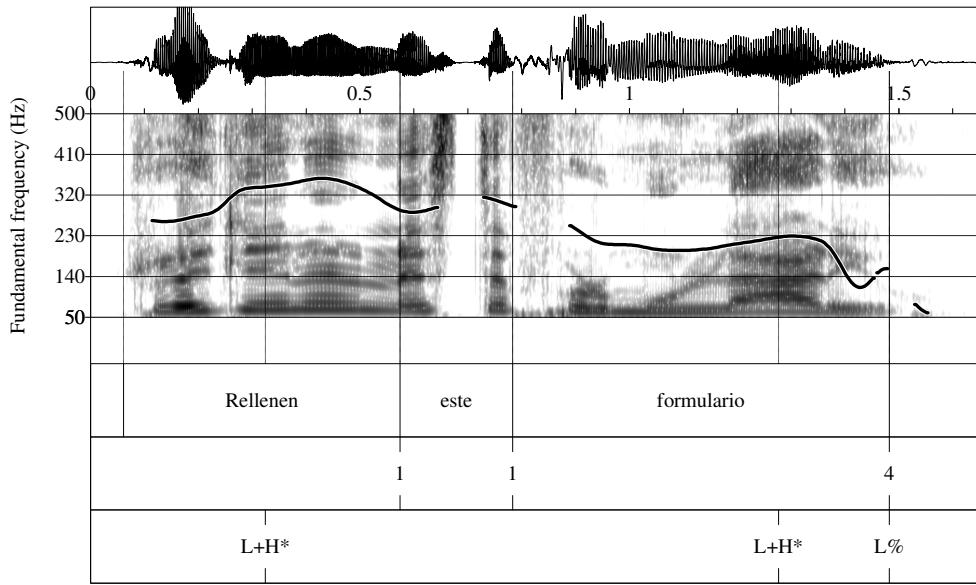


Figure 14: Waveform, wideband spectrogram and F0 pitch track of the command *Rellenen este formulario* ('Fill out this form') produced with a $L+H^* L\%$ nuclear configuration.

Some realizations of this pitch accent can be downstepped. This fact can be coded with the mark $<!>$ and, therefore, expressed by a $L+!H^* L\%$ nuclear contour. This is the case of the example in Figure 15, uttered by another speaker.

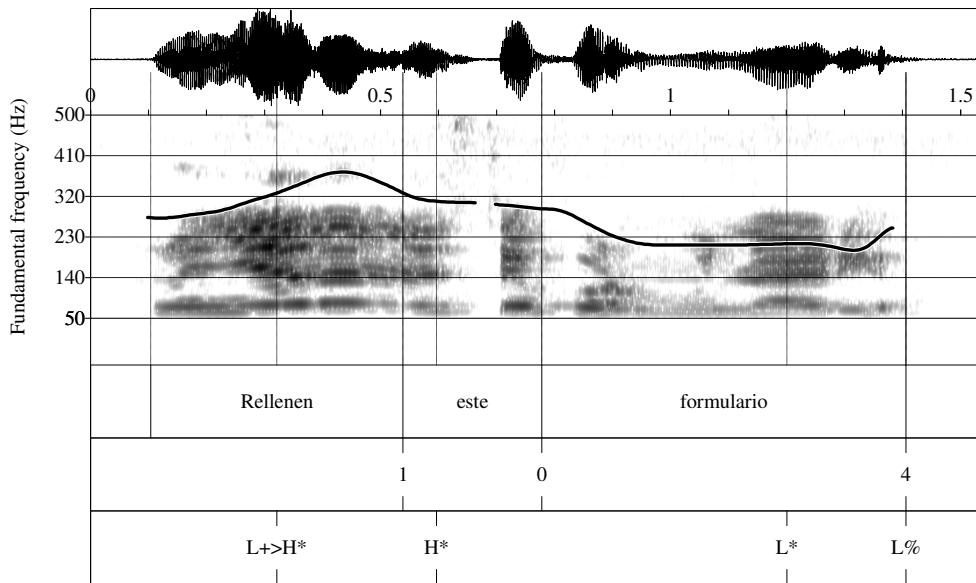


Figure 15: Waveform, wideband spectrogram and F0 pitch track of the command *Rellenen este formulario* ('Fill out this form') produced with a $L+!H^* L\%$ nuclear configuration.

2.3.2. Requests

Gentle requests show a softer illocutionary strength than commands and are commonly produced with a L+H* HL% tonal configuration. This is illustrated in Figure 16 with the insisting request *¡Ay, ya! Vamos al cine, [no seas payaso]* ('Come on, [don't be an idiot,] let's go to the cinema!') The circumflex movement L+H* HL- and L+H* HL% can appears at the end of both the intermediate and intonational phrases. In this pitch configuration, the high tone at the end of the stressed syllable *ci-* is kept high during the onset of the posttonic syllable *-ne* and then the pitch falls till the end of the intermediate phrase.

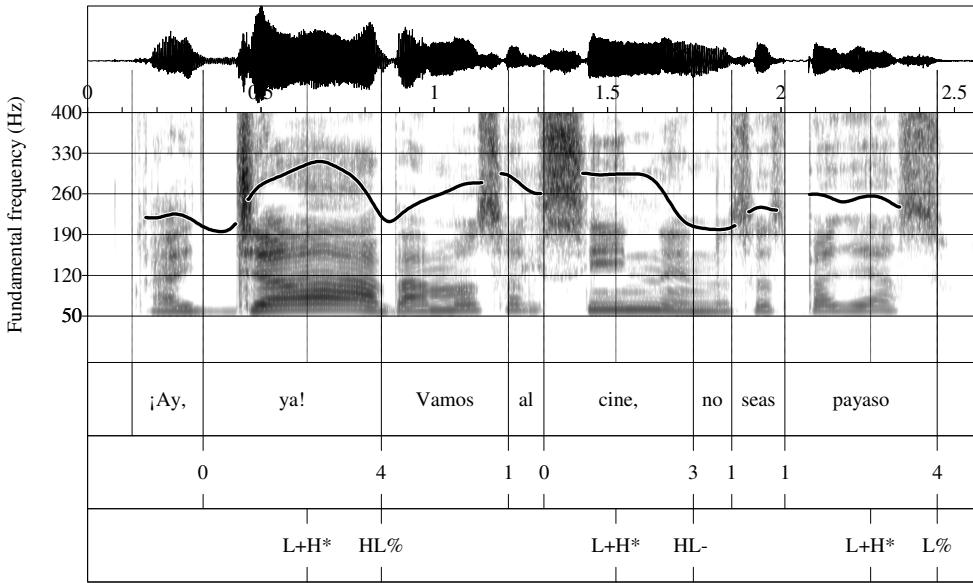


Figure 16: Waveform, wideband spectrogram and F0 pitch track of the request *¡Ay, ya! Vamos al cine, no seas payaso* ('Come on, don't be an idiot, let's go to the cinema!') produced with a L+H* HL% nuclear configuration.

2.4. Vocatives

Vocatives are used to call to someone, commonly out of sight, by trying to catch his or her attention. The ‘spoken chant’ or ‘vocative chant’ typically consists of a high tone associated with the stressed syllable followed by a mid tone associated with the posttonic syllables. This final sustained mid tone, which is widely used in vocatives in languages like English (Ladd 1978), Dutch (Gussenhoven 1993), French (Fagyal 1997), Portuguese (Frota in press) and Catalan (Prieto in press), is thus also found in Mexican Spanish. However, as expected, different contours can be used to convey subtly different meanings. The following three cases are instances of the same utterance, namely the proper name *Marina*, used as a vocative. This vocative is produced with a L+H* or a L* pitch accent, and followed by two types of boundary tones used for different purposes, namely, M% and HM%. These contours are described below.

2.4.1. Vocative chants

Vocatives can be used when demanding attention gently and softly to someone who is not necessarily out of sight or far away. In this case, after a rise, the peak is placed right at the onset of the posttonic syllable, which is followed by a pitch level that is

sustained until the end of the utterance. This is exemplified in Figure 17 with the vocative *¡Marina!* :

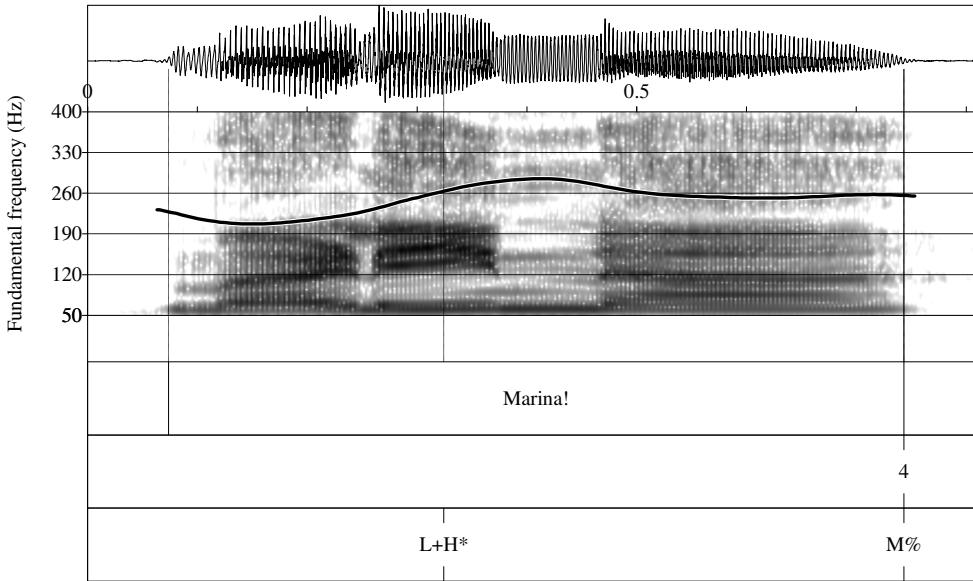


Figure 17: Waveform, wideband spectrogram and F0 pitch track of the kind vocative chant *¡Marina!* ('Marina!') produced with a L+H* M% nuclear configuration.

The nuclear configuration L+H* M% has also been attested for vocatives in other Spanish varieties like Andean Spanish (O'Rourke, this volume), Castilian Spanish (Estebas-Vilaplana and Prieto, this volume) and Chilean Spanish (Astruc, Ortiz and Fuentes, this volume).

2.4.2. Calling vocatives

Calling vocatives are used when trying to get attention from someone who will probably have difficulty in hearing us because of distance or from someone who has not answered a first call. In Mexican Spanish the nuclear rising pitch accent of calling vocatives starts with the accented syllable, rises fast, ends in a high plateau which spreads across the posttonic lengthened syllable and finally sinks downward at the very end to a medium level. This L+H* HL% contour is exemplified in Figure 18.

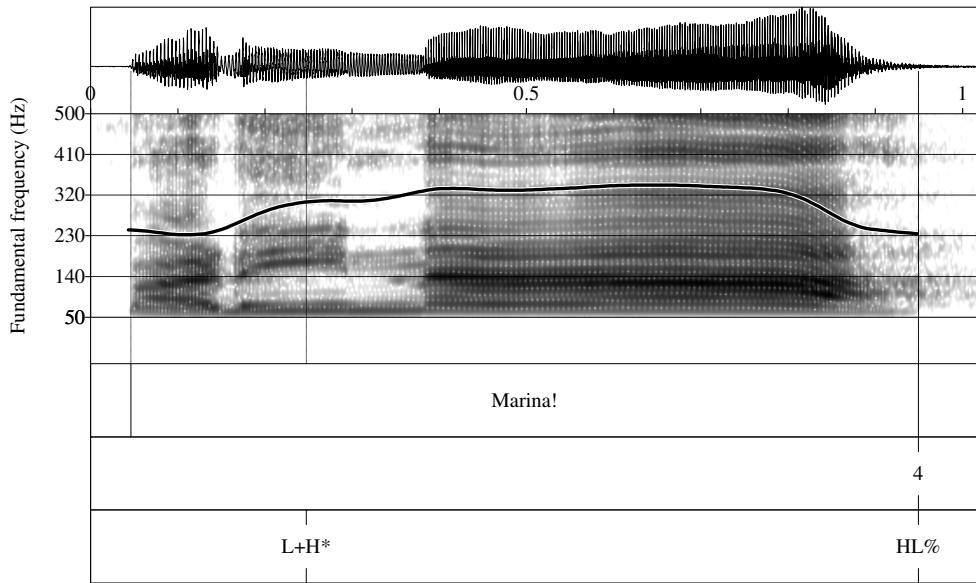


Figure 18: Waveform, wideband spectrogram and F0 pitch track of the calling vocative *¡Marina!* ('Marina!') produced with a L+H* HL% nuclear configuration.

The pattern found in Mexican Spanish is similar to the one attested in Castilian Spanish (Estebas-Vilaplana and Prieto, this volume) and Puerto Rican Spanish (Armstrong, this volume).

2.4.3. Request vocatives

Vocatives calling to and demanding attention from someone can also be used as requests and recriminations. In these situations, a soft call would be considered inappropriate. Request vocatives in Mexican Spanish are commonly produced with a L* HL% tonal configuration. The pitch rises gradually to a high level which is achieved late, during the last vowel. Then there is a final fall to the speaker's minimum range. Figure 19 shows this contour in the sequence *¡Marina!*

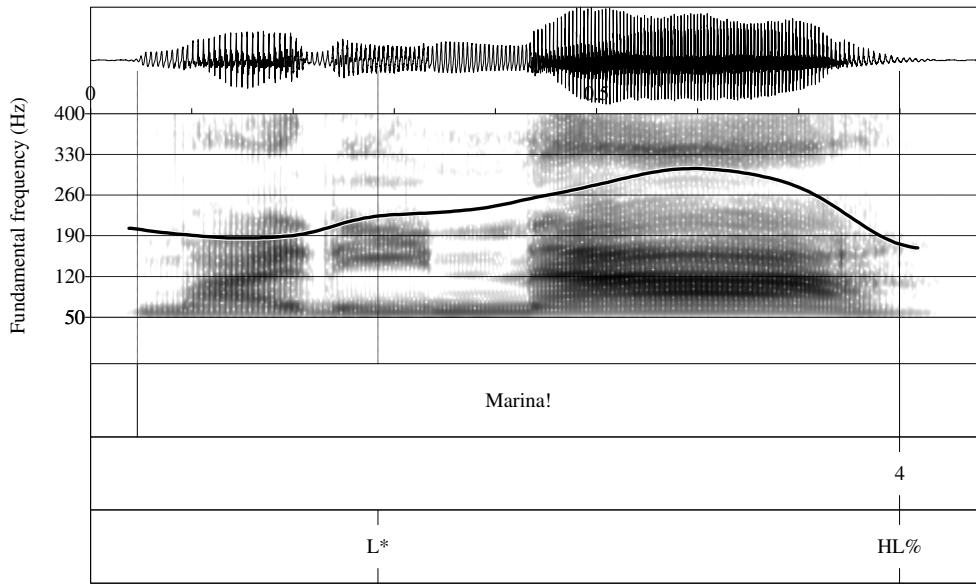


Figure 19: Waveform, wideband spectrogram and F0 pitch track of the request vocative *'Marina!'* ('Marina!') produced with a L* HL% nuclear configuration.

The rise-fall ending HL% in vocatives has also been attested with similar meanings in Puerto Rican Spanish (Armstrong, this volume) and Peninsular Spanish (Estebas-Vilaplana and Prieto, this volume).

Request vocatives can also be produced with a L+H* L% nuclear configuration with other associated meanings. Although the nuclear pitch accent is the same as in other vocative types, the low, long and flat ending could presumably be responsible for the recriminatory content. This is shown in Figure 20.

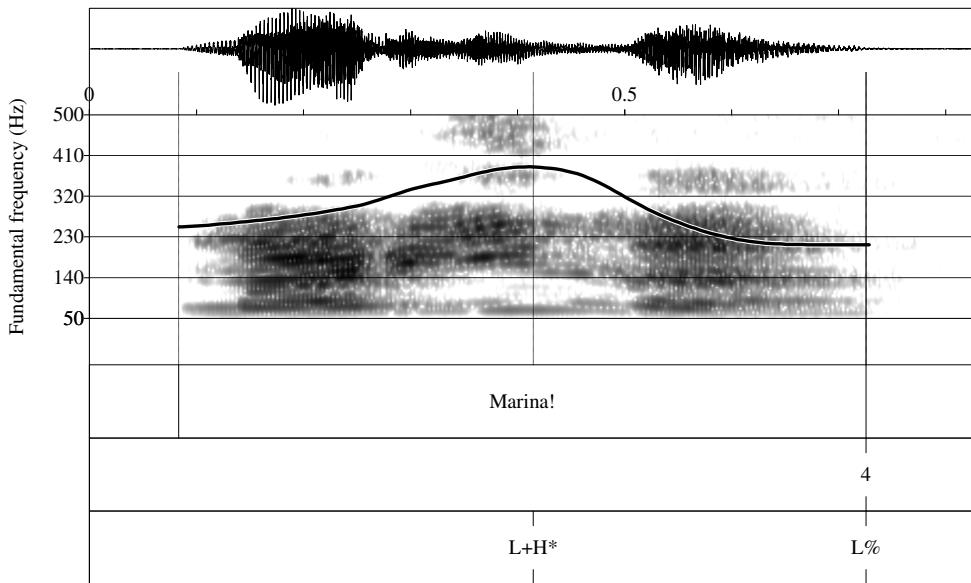


Figure 20: Waveform, wideband spectrogram and F0 pitch track of the request vocative ¡Marina! ('Marina!') produced with a L+H* L% nuclear configuration.

It would be of interest to undertake perceptual tests in order to demonstrate that the abovementioned changes in the nuclear and boundary tone regions of the nuclear configuration lead to these meaning contrasts in vocatives.

3. Conclusions

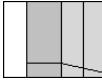
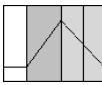
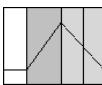
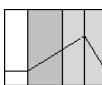
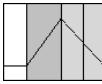
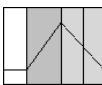
This chapter has presented a set of commonly occurring nuclear configurations in Mexican Spanish. The attested contours represent a further contribution to the analysis of the intonation of this variety using semi-spontaneous elicited speech. Our analysis has shown that the intonational contrasts found in Mexican Spanish can be handled with the standard Sp_ToBI labeling conventions. Such a unified account in the Sp_ToBI framework is useful to describe Mexican intonation, since it captures the relevant empirically observed patterns attested so far and allows a further comparison between Mexican Spanish intonation contours and the intonation contours produced in other Spanish varieties. The main findings can be summarized as follows.

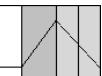
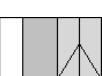
In Mexican Spanish, 'circumflex' nuclear configurations are used in statements and wh-questions, namely L+H* L%, L+H* HL% and L+H* M%. Though the circumflex configurations exist in other varieties, they have a more restricted pragmatic scope than in Mexican Spanish. Information-seeking questions in this variety are produced as L* LH%, with a long and very high final rise, and inviting questions as L* HH%. A similar alignment contrast has been found in Peninsular Spanish, namely L* HH% vs. L+H* HH% (see Thorson et al. 2009, Estebas and Prieto, this volume). In general, Spanish crossdialectal data show a general trend in linking specific contours to certain kinds of pragmatic meanings; yet there are also cases in which a specific dialect shows a distinct implementation, such as a different type of alignment difference.

In Mexican Spanish, the contrast between a command and a request is expressed through a different nuclear pitch configuration, namely L+H* L% for the expression of a command and L+H* HL% for the expression of a request, together with durational cues. This is also the case with the differences found in interrogative sentences between Castilian and Mexican Spanish. In addition, a potential contrast was found in the height of boundary tones in vocatives, which can be linked to different meanings. It would be useful to undertake perceptual experiments to test the effects of tonal alignment and tonal scaling on the expression of different discourse meanings as well as to analyze in depth the variety of contrastive pitch configurations present in the dialect, and their meanings.

Finally, a summary of the main nuclear pitch configurations found is presented in the following chart for the different sentence types. As is well known, nuclear pitch contours can be used in a polysemic way to convey different meanings.

Table 1: Inventory of nuclear pitch configurations and their schematic representations in Mexican Spanish.

<i>Statements</i>		
Broad focus statements	L* L%	
	L+H* L%	
Narrow focus and emphatic statements	L+H* L%	
Obviousness statements	L+H* LM%	
Categorical statements	L* HL%	
<i>Questions</i>		
Yes-no questions	L* LH%	
Invitation yes-no questions	L* HH%	
Neutral wh- questions	L+H* HL%	
<i>Biased questions</i>		
Incredulity questions	L* LH%	
Imperative yes-no questions	L* LH%	
Exclamative wh- questions	L+H* L%	
Imperative wh- questions	L+H* L%	

Exhortative wh- questions	L+H* M%	
<i>Imperatives: commands and requests</i>		
Commands	L+H* L%	
Requests	L+H* HL%	
<i>Vocatives</i>		
Vocative chants	L+H* M%	
Calling vocatives	L+H* HL%	
Request vocatives	L* HL%	
	L+H* L%	

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