

Puerto Rican Spanish Intonation*

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1. Introduction

The goal of the 1st Sp_ToBI workshop held in October 1999 at The Ohio State University was to develop prosodic transcription conventions that would be useful for the description of multiple varieties of Spanish. These conventions are laid out in Beckman et al. (2002), and a revised version of these is depicted in Estebas-Vilaplana and Prieto (2008). Both proposals are based on the Autosegmental-Metrical (AM) approach for intonational analysis, which resulted from the seminal work of Pierrehumbert (1980) and was later developed by Ladd (1996). While the intonational phonologies of a wealth of other languages as well as other varieties of Spanish (most extensively Castilian Spanish) have been analysed within the AM framework, only Sosa (1999) has analysed Puerto Rican Spanish within the AM model.

Comprehensive studies of Puerto Rican Spanish intonation prior to the late 1980s/early 1990s are few. Earlier investigations include a brief description by Kvavik (1978) and an even earlier one by Mauleón Benítez (1974), who compared intonational contours for five utterance types in Puerto Rican Spanish with speakers from the Loíza Aldea neighbourhood of Puerto Rico as well as a Papiamentu speaker. Quilis (1987) later considered F0 contours for basic utterance types from a dialectal perspective, comparing those contours found in the spontaneous speech of Puerto Rican Spanish, Mexican and Castilian Spanish speakers. He also (1993) compared Puerto Rican Spanish, Mexican, Canarian and Madrid Spanish, reporting on expressive and stylistic uses of intonation in those dialects. Sosa's (1999) section on dialect and intonation (1999) includes an AM theory analysis of basic utterance types in Puerto Rican Spanish that builds on Quilis' claims for the variety. More recent work by Sosa (2003) elaborates on wh- questions in Mexican, Colombian, Venezuelan and Puerto Rican Spanish, and he points out similarities between the latter two Caribbean varieties for this type of question. While Sosa couches his 1999 account within the AM framework for intonational analysis, no complete description of the intonational phonology of Puerto Rican Spanish within the tenets of Sp_ToBI exists. Therefore this chapter aims to provide a more complete picture of Puerto Rican Spanish intonational phonology than has previously been rendered, providing an up-to-date analysis reflecting the most recent advances in transcription conventions for Spanish intonation within the Sp_ToBI framework.

In this chapter I account for the typical tunes of Puerto Rican Spanish based on new empirical data, and as mentioned above, within the Sp_ToBI framework. While previous

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accounts have described basic utterance types such as declaratives, yes-no questions and wh- questions, my data set includes a much wider array of utterance types. The utterance types investigated here are: broad and narrow focus statements, yes-no questions, wh-questions, commands, requests and vocatives. I also include the analysis of several specific contours for exclamative statements, statements of the obvious and other specific question types. The data included in this study come from two guided questionnaires. The first questionnaire, based on the one used in Prieto (2001), described a variety of prompt contexts intended to elicit a broad range of intonational contours.¹ Later, a follow-up questionnaire was administered to examine four types of yes-no questions as well as two types of confirmation questions. Differences in contours were found based on pragmatic context and information structure. Like the other chapters in this volume, my analysis is based on the ideas laid out in the first Sp_ToBI proposal (Beckman et al. 2002), but mainly on its revised version (Estebas-Vilaplana and Prieto 2008).

The organization of the chapter is as follows: in Section 2 I present an overview of Puerto Rican Spanish intonational phonology, laying out the inventory of pitch accents (monotonal and bitonal) as well as boundary tones (monotonal and bitonal). In Section 3 I present a description of various utterance types in Puerto Rican Spanish that best demonstrate the variety of intonational patterns in this dialect of Spanish. I conclude by highlighting the most important findings as well as providing a summary of the nuclear configurations that are most common in this variety of Spanish.

2. Puerto Rican Spanish intonational phonology

2.1. The pitch accents

The most recent Sp_ToBI proposal (Estebas-Vilaplana and Prieto 2008) includes a distinction between the category L^{*}+H, phonetically realized as a low tone on the accented syllable followed by a rise on the posttonic syllable (or later), and the L+>H^{*} category, which is realized as a rising pitch movement throughout the accented syllable and a H tone aligned on the posttonic syllable. Part of the motivation for revisiting rising bitonal pitch accents in Sp_ToBI comes from Willis (2003), who showed that Dominican Spanish uses L^{*}+H in prenuclear position in broad focus declaratives, but L+>H^{*} in prenuclear position for narrow focus declaratives. My analysis shows evidence for this distinction in Puerto Rican Spanish as well, and not surprisingly, given the many phonological features shared among Caribbean varieties. It should be noted, however, that Puerto Rican Spanish strongly favours the prenuclear pitch accent L^{*}+H in general, which appears very frequently in statements, yes-no questions, wh- questions and commands. The frequent use of L^{*}+H in prenuclear position is typical of both Canarian and Dominican Spanish (both in this volume) and, as I will show, is one of a number of intonational characteristics that these dialects share. The bitonal pitch accent L+H^{*} is commonly found in nuclear position for narrow focus statements and exclamative statements. The frequent use of L+H^{*} at intermediate phrase boundaries for statements is also noteworthy in this variety. My data also confirm the need, cited by Estebas-Vilaplana and Prieto, to incorporate the monotonal pitch accent L^{*} into the Sp_ToBI system in order to account for an array of nuclear configurations in the variety such as tag

¹ An adapted version of Prieto (2001) was also used for the *Atlas interactivo de la entonación del español*. <http://prosodia.upf.edu/atlasentonacion/>

questions, incredulity questions, polite and exhortative requests and statements of the obvious.

Table 1 shows the inventory of pitch accents available in Puerto Rican Spanish as well as some of the types of utterances for which they are typically found, as well as their descriptions based on Estebas-Vilaplana and Prieto (2008).

Table 1: Inventory of monotonal and bitonal pitch accents in Puerto Rican Spanish and their schematic representations

Monotonal pitch accents



L*

This accent is phonetically realized as a low plateau at the bottom of the speaker's pitch range. In this corpus, it is found in nuclear position for tag questions and incredulity questions.



H*

This accent is phonetically realized as a high plateau with no preceding F0 valley. In this corpus, it is used in nuclear position for narrow focus and exclamative statements, and in prenuclear position in yes-no questions.



iH*

This pitch accent occurs in nuclear position, with the high tone produced extra high. Its phonetic realization in nuclear position is affected by the following boundary tone. When followed by a high boundary (top), the high plateau persists throughout the duration of the tonic syllable. When followed by a low boundary (bottom), the F0 persists throughout the syllable onset and may begin the fall anywhere from early in the vowel to about three quarters of the way through it. It is found in nuclear position for polite questions, imperative questions and broad focus yes-no questions.



Bitonal pitch accents



L+H*

This accent is phonetically realized as a rising pitch movement during the accented syllable with the F0 peak located within this syllable. The peak is typically aligned with the end of the syllable for exclamative statements (top). The peak may also be reached early in the syllable as found for narrow focus statements in this corpus (bottom). This may be accompanied with syllable lengthening. It is quite common to find this pitch accent at intermediate phrase boundaries in Puerto Rican Spanish for statements.



L+iH*

This accent is phonetically realized as a rising pitch movement during the accented syllable to an extra-high F0 peak. It is found for yes-no and wh- echo questions as well as counterexpectational questions.



- L+>H* This accent is phonetically realized as a rising pitch movement throughout the accented syllable with the F0 peak located in the posttonic syllable. These can be found in prenuclear position in narrow focus statements and echo wh- questions.



- L*+H This accent is phonetically realized as a flat F0 valley throughout the accented syllable with a subsequent rise on a post-accented syllable. This is by far the most common prenuclear pitch accent in the data for this dialect, and can be found for statements, yes-no questions, wh- questions and commands, among others.



- H+L* This accent is phonetically realized as a F0 fall throughout the nuclear accented syllable for wh- questions (top). For positive confirmation questions, the onset of the fall is found in the pretonic syllable (bottom).



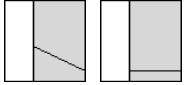
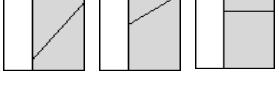
- !H+L* This accent is phonetically realized as a fall from a relatively high tone produced which is produced in a low (compressed) pitch range to a low target. This pitch accent is typical in nuclear position for broad focus statements.

2.2. The boundary tones

As noted in the Castilian Spanish chapter in this volume, Sosa's proposal to use a bitonal pitch accent (T^*+T) followed by a monotonous pitch accent becomes problematic when considering complex final pitch movements. This is discussed in Section 3.1.2.3 for the statements of the obvious, where a final rise-fall always occurs in the posttonic syllable. Without allowing for bitonal boundary tones, a nuclear configuration like $L+H^* LM\%$ is difficult to justify. If we were to incorporate the rise in the posttonic into the pitch accent itself, the pitch accent would then need to reflect three pitch movements (HLM). While tritonal pitch accents are indeed necessary to explain complex movements in Spanish dialects (see Gabriel et al. this volume for Argentinian Spanish), it is a more marked option to propose them. By analysing the final rise-fall as a complex boundary tone, this problem is avoided. Therefore, the incorporation of complex boundary tones in the revised Sp_ToBI proposal was a very necessary modification for the description of boundary tones in Puerto Rican Spanish.

Prieto and Estebas-Vilaplana (this volume) also note that within the traditional AM theory, only low (L) and high (H) tones are allowed, though the original Sp_ToBI proposal does allow for a mid (M) boundary tone. The revised version of Sp_ToBI confirms the usefulness of this transparent labelling convention. The data from Puerto Rican Spanish show clear instances of mid (M) boundary tones at the end of non-final constituents and in nuclear position for some exclamative statements and also for polite requests in Puerto Rican Spanish. In table 2 I provide the inventory of boundary tones found in the data for Puerto Rican Spanish.

Table 2: Inventory of monotonal and bitonal boundary tones in Puerto Rican Spanish and their schematic representations

<i>Monotonal boundary tones</i>			
	L%	L% is phonetically realized as a low sustained tone or a falling tone at the baseline of the speaker. It is attested at the end of broad and narrow focus statements, yes-no questions, wh- questions and imperatives, among others.	
	M%	M% is phonetically realized as a rising (right) or a falling (centre) movement to the end of a non-final constituent, or a sustained midtone after a high nuclear pitch accent (left). It is attested in broad and narrow focus statements, and also at the end of commands and statements of the obvious.	
	H%	H% is phonetically realized as a rising pitch movement coming from a low or a high pitch accent. It may be found at the end of non-final constituents, but also at the end of an intonational phrase. A final rise from a low pitch accent is found in tag questions and reprise wh-questions. A sustained high tone is found for imperative yes-no questions in this variety.	
<i>Bitonal boundary tones</i>			
	HL%	HL% is phonetically realized as a peak in F0 followed by a fall. It is commonly found for incredulity questions, exhortative requests and stylized calling contours.	
	LH%	LH% is phonetically realized as a low F0 valley followed by a rise. It is attested in statements of the obvious.	

3. Basic intonational patterns in Puerto Rican Spanish

The first guided questionnaire employed in this study was adapted from Prieto 2001 specifically for Puerto Rican Spanish. The Appendix of this volume shows the sixty-nine sentences elicited for the first questionnaire (for Ecuadorian Andean Spanish). The questionnaire was adapted so that it included lexical items and syntactic structures commonly found in Puerto Rican Spanish. For instance, Puerto Rican Spanish shows many English borrowings. While many of the Spanish dialects included in this volume use the word *panadería* for ‘bakery’, it is common in Puerto Rican Spanish to use the English loanword ‘bakery’ ['bejkeri]. Similar dialectal nuances were considered when preparing the situations and target utterances in the questionnaire.

The situations included in the questionnaire were designed to elicit an array of intonational contours from the subjects. For both questionnaires, the participants silently read contexts for each situation and produced the target utterances out loud. At times

instead of silently reading a situation, the participant and the experimenter (the author) would engage in a scripted dialogue. The participants were told that they could repeat any of the utterances if they felt that they had produced them unnaturally. Additionally, they were told they could change the scripted utterance and substitute some other phrase that they deemed more natural in the situation. Two males (aged 30 and 21) and five females (ages 21-25) responded to the first questionnaire and were recorded using a Zoom H2 Handy recorder. 483 utterances were analysed.

As I have noted above, a second, follow-up questionnaire was conducted in addition to the one based on Prieto 2001 in order to explore more thoroughly the area of yes-no questions in Puerto Rican Spanish. This questionnaire consisted of two parts. The first part included four different question types: broad focus yes-no questions, yes-no questions with negation, incredulity yes-no questions and echo questions (see Armstrong 2010 for an in-depth description of the distribution of these four question types). The participants were presented with 20 different contexts for which they had to read aloud each question type. Participants produced the same or a very similar segmental string for each question type. For example, the question *¿María vive en Aguada?* ‘Does María live in Aguada?’ was produced as a broad focus question, with negation, as an incredulity question and as an echo question. The second part of the questionnaire was a loose translation of the situations used in Ladd’s (1981) paper on inner and outer negation and was designed to assess the effect of information structure on intonational encoding for three question types: broad focus yes-no questions and two types of confirmation questions. The confirmation questions differed in terms of the speaker’s belief about propositional content. I elicited confirmation questions produced in situations in which the speaker had just found out the negation of some proposition ($\sim p$) and another for which the speaker believed the proposition to be true (p). Striking differences were uncovered based on this distinction and are described in Section 3.2.2.3. The second questionnaire was comprised of a total of 26 target utterances. 14 participants (4 males, 10 females) from various parts of Puerto Rico participated as subjects in this second study and were between the ages of 19 and 45 at the time of the recording. Therefore, 364 utterances were analysed from the second questionnaire. A grand total of 847 utterances, then, were yielded by the two questionnaires. The data were analysed using Praat (Boersma and Weenink 2010). This chapter only reports on tunes that were found to be consistent across speakers (those from the San Juan metropolitan area as well as other parts of Puerto Rico).

3.1. Statements

3.1.1. Broad focus statements

In the first Sp_ToBI version, Beckman et al. (2002) proposed a rising, bitonal prenuclear accent L^*+H , described as having a peak after the stressed syllable and valley toward the beginning or toward the middle of the stressed syllable as a prenuclear accent in some Caribbean varieties. In his account of prenuclear broad focus statements in Dominican Spanish, Willis (2003) reports a low tone throughout most of the accented syllable followed by a rise in F0 beginning near the end of the stressed syllable. The rise occurs mainly in the posttonic syllable. Face and Prieto (2007) responded to the need to account for this low flat tone throughout the accented syllable as opposed to one that rises throughout, proposing a distinction between two nuclear accents: L^*+H for the former and $L+>H^*$ for the latter in their Sp_ToBI revision. Like Dominican Spanish, Puerto Rican Spanish also has a prenuclear rising pitch accent characterized by a flat low tone throughout the accented syllable followed by a rise in a posttonic syllable. This rise is heavily favoured in Puerto Rican Spanish

for broad focus statements. Figure 1 shows a typical broad focus statement in Puerto Rican Spanish, with a L^{*}+H prenuclear pitch accent. As described in table 1, L^{*}+H is characterized by a level low tone throughout the stressed prenuclear syllable followed by a rising trajectory that occurs in the posttonic syllable(s). In Puerto Rican Spanish, the flat low tone tends to continue throughout the entire accented syllable.

The final pitch movement for broad focus statements within Sp_ToBI is characterized by a fall throughout the accented syllable of the final word. This fall is produced within a compressed pitch range and as a result, the high tone produced within this compressed range is lower in the speaker's range than we would typically expect for a high tone. To reflect this, the fall within the nuclear tonic syllable is labelled !H+L*, followed by a low boundary tone L%. Note that the leading tone of this bitonal pitch accent is labelled as downstepped. In this case, the diacritic (!) indicates the scaling of the high tone (the high is "lower" than a typical high)². The onset of the fall for the !H+L* pitch accent occurs at a lower point than it does for positive confirmation questions and wh- questions in this variety, as I show later in the chapter. Similar phrase final falls are found for broad focus in Canarian Spanish (Cabrera Abreu and Vizcaíno Ortega this volume). As mentioned, Canarian Spanish and Puerto Rican Spanish have been claimed to share a number of both segmental and suprasegmental features (Quilis 1993, Quilis 1987, Sosa 1999, Torreira 2008). The utterance *Está bebiendo limonada* in figure 1 shows the !H+L* nuclear pitch accent for the accented syllable -na- in the phrase-final word *limonada*. As shown, the fall is produced low in the speaker's pitch range.

An additional phenomenon found in broad focus declaratives is a mid boundary tone at the intermediate phrase boundary. Figure 2 shows two instances of the mid boundary tone M- preceded by the L+H* nuclear pitch accent in the utterance *La nena morena está comiendo chinas mandarinas*. Here they are found at the end of each intermediate phrase: after the word *morena* and after the word *comiendo*. In both cases, we find a fall to a mid tone from the preceding high tone from the L+H* pitch accent. As stated above, the use of L+H* at the intermediate phrase boundary is quite characteristic of Puerto Rican Spanish. The nuclear pitch accent is the same as in that in figure 1, !H+L*.

3.1.2. Biased statements

3.1.2.1. Narrow focus statements

Rather than the nuclear fall through the syllable to a low target that we would expect for broad focus statements in Puerto Rican Spanish, a high plateau throughout the accented nuclear syllable is characteristic of some narrow focus statements. Figure 3 shows the utterance *No, de limones* as an example of a narrow focus statement which the speaker uses to correct her interlocutor, who thought the speaker had wanted a pound of oranges. The speaker corrects her by telling her that she wants a pound of lemons (i.e. not oranges, lemons), using contrastive focus. We find contrastive focus on *limones* which occurs in nuclear position and shows a high plateau (H*) throughout the accented syllable, followed by a low boundary tone L%.

² In traditional ToBI labelling the downstepped symbol would indicate that a given tone is produced lower in relationship to a preceding tone of the same category. In this case, the diacritic indicates that the high tone is produced lower than expected. Therefore, the scaling of the nuclear tone is not an effect of preceding tones.

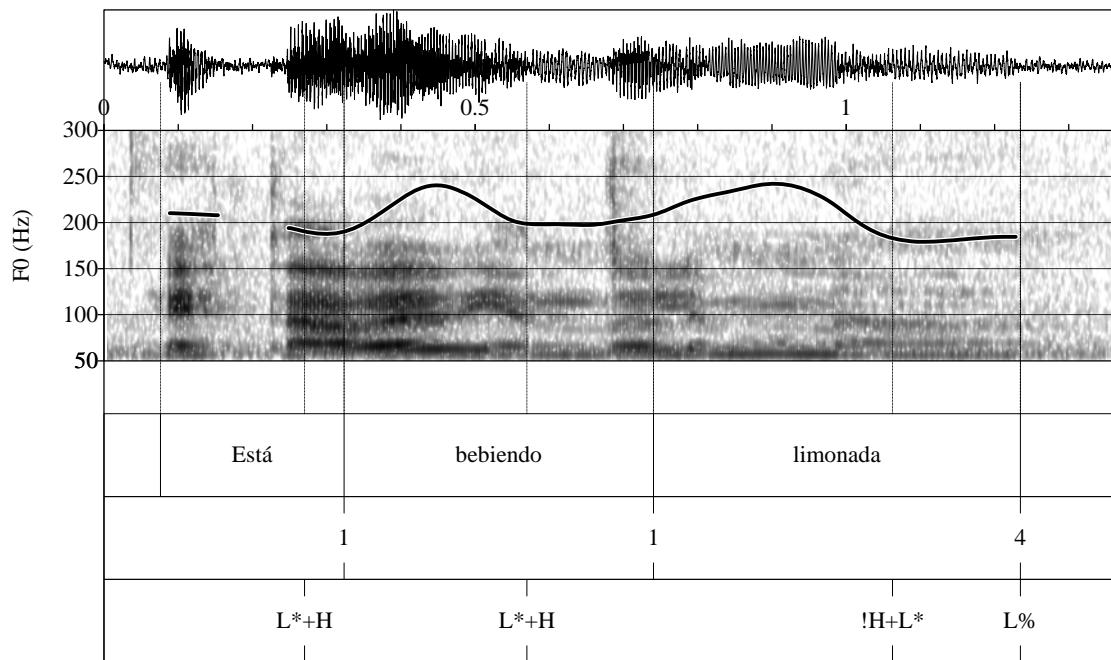


Figure 1: Waveform, spectrogram and F0 trace for the broad focus statement Está bebiendo limonada ‘She’s drinking lemonade’ produced with a L*+H prenuclear accent and !H+L* nuclear accent followed by a L% boundary tone.

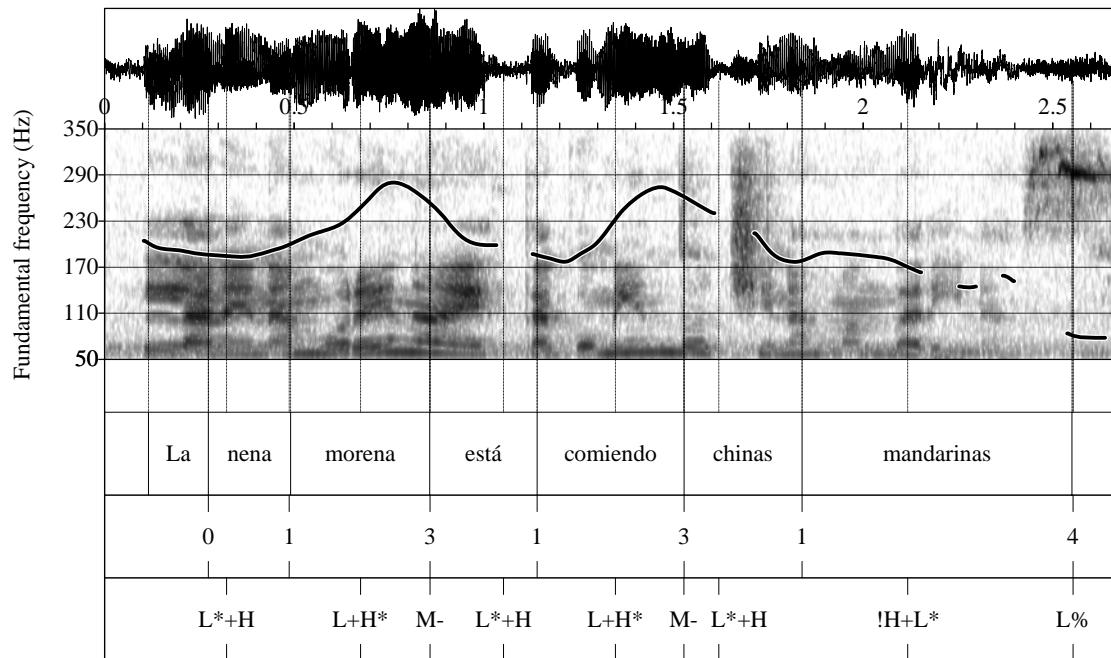


Figure 2: Waveform, spectrogram and F0 trace for the neutral statement La nena morena está comiendo chinas mandarinas ‘The dark-haired girl is eating oranges’ produced with L+H* nuclear pitch accents before a M- phrase boundaries, and finally the typical !H+L* L% nuclear configuration.

Differently from broad focus statements, we also find the L+>H* prenuclear pitch accent for narrow focus statements, phonetically implemented as a rise throughout the accented syllable with a peak reached in the posttonic. As I pointed out in the previous section, Willis (2003) showed that broad focus statements were produced with L*+H prenuclear accents by his Dominican Spanish informants. He describes this prenuclear pitch accent with the F0 valley aligned near the onset of the accented syllable, and the F0 peak in the posttonic (similar to the prenuclear accents in many varieties of Spanish). At least for some narrow focus statements in Puerto Rican Spanish, the same is true, as shown in figure 4. In the utterance *Se mudan a Aguadilla*, we find a rise throughout the accented syllable *mu-* which continues into the posttonic syllable. The nuclear configuration shown here is common for other varieties of Spanish in this volume (Chilean, Mexican, Castilian): a rise to a peak within the nuclear accented syllable followed by a fall to a low boundary. This nuclear configuration is labelled L+H* L%. Figure 4 shows an utterance that the speaker produces to correct her interlocutor, who thinks that some mutual friends are moving to Ponce. The speaker is sure that they are moving to Aguadilla (both cities in Puerto Rico). Therefore, the word *Aguadilla* is in contrastive focus. The nuclear pitch accent L+H* used for narrow focus statements contrasts with the category L+jH* in Puerto Rican Spanish (used for echo questions, for example). The two categories contrast based on scaling differences of the starred high tone in the tonal space: it is produced at a higher pitch level in echo questions, for example, than the one used for narrow focus statements. Echo questions are discussed in more detail in Section 3.2.2.1. Figure 4 shows an example of the utterance *Se mudan a Aguadilla* produced with a L+>H* prenuclear pitch accent and a L+H* L% nuclear pitch configuration. The difference between L+H* for narrow focus and L+jH* for echo questions has also been described for Catalan by Borràs-Comes et al. (2010).

3.1.2.2. Exclamative statements

Figure 5 is an example of a wh- exclamative with which the speaker conveys that she likes the smell of bread in a bakery. The common contour for this specific context is produced with a low plateau in the stressed vowel (L*) in the monosyllabic word *pan* followed by a rise to a mid target at the end of the utterance. The boundary tone is labelled M%. Figure 5 shows the utterance *iQué rico olor a pan!* produced with the L*+H prenuclear accent and L* M% nuclear configuration. This contour is found in other varieties of Spanish with the same function, as in Ecuadorian Andean Spanish (O'Rourke this volume), for example.

Figure 6 is an example of an exclamative statement. With the utterance *iEstá riquísimo!* ‘It’s really delicious!’ the speaker makes a remark about the degree of tastiness of some food she has tried, using the Spanish intensifier *-ísimo* on the adjective for delicious *rico*. The nuclear accent is realized as a rise to a high F0 peak which is reached within the accented syllable followed by a fall to a low boundary tone L+H* L%. The typical prenuclear pitch accent L*+H is used.

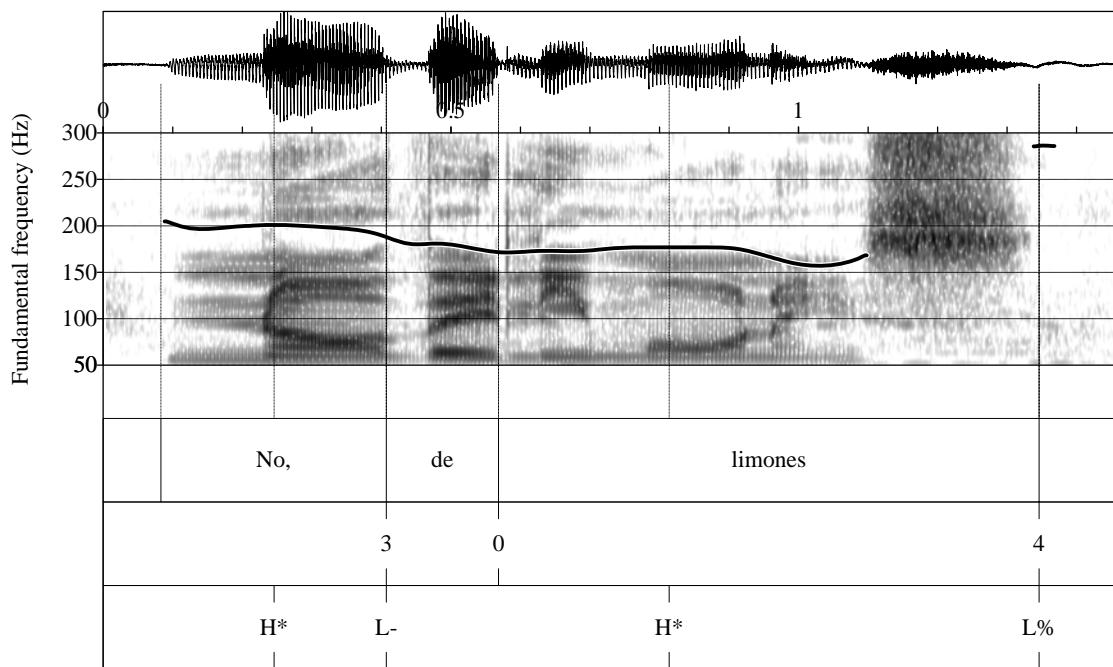


Figure 3: Waveform, spectrogram and F0 trace for the narrow focus statement No, de limones 'No, of lemons' produced with a H* nuclear pitch accent and L% phrase boundary.

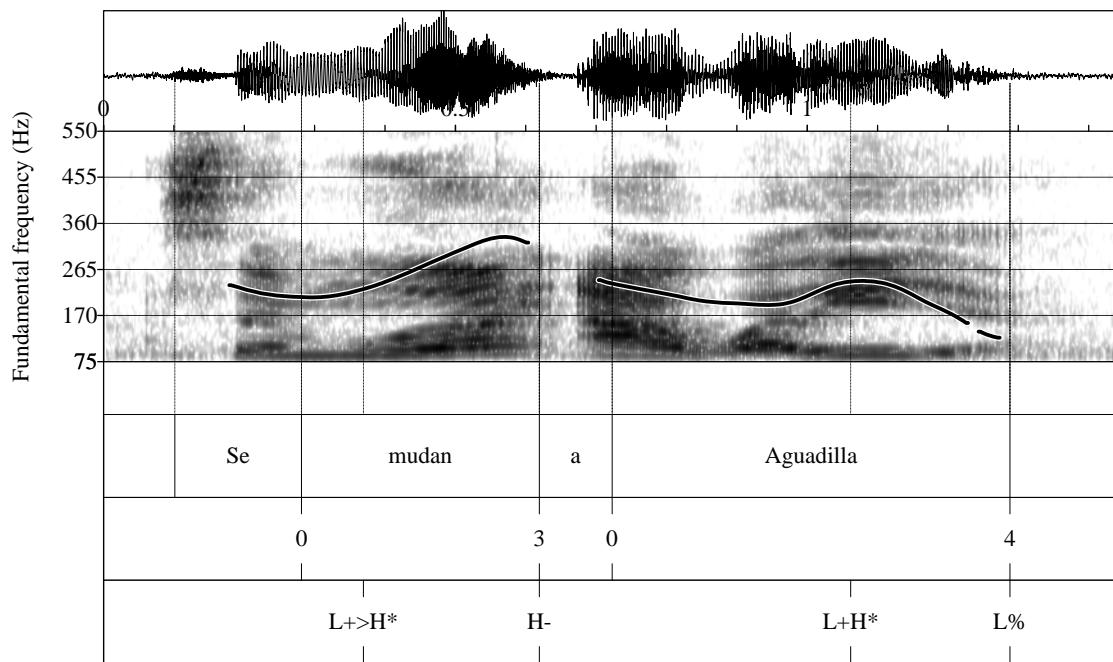


Figure 4: Waveform, spectrogram and F0 trace for the narrow focus statement Se mudan a Aguadilla 'They're moving to Aguadilla' produced with a L+>H* prenuclear pitch accent and high phrase boundary H-, followed by the L+H* L% nuclear configuration.

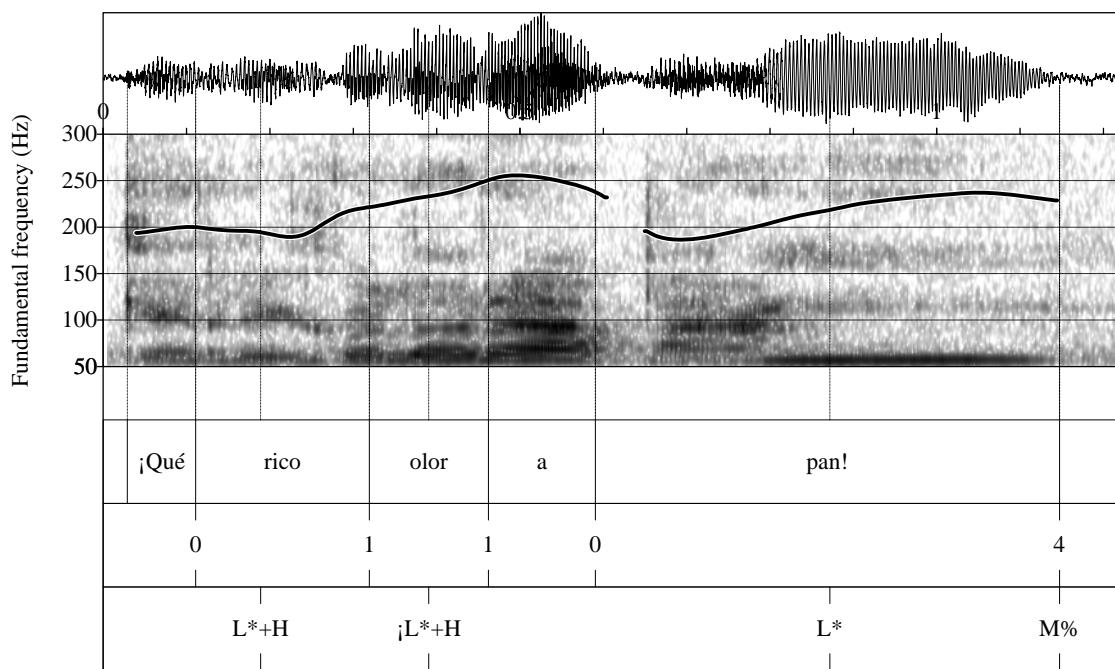


Figure 5: Waveform, spectrogram and F0 trace for the biased exclamative statement ¡Qué rico olor a pan! ‘How good the bread smells!’ produced with a L^*+H prenuclear pitch accent and $L^* M\%$ nuclear configuration.

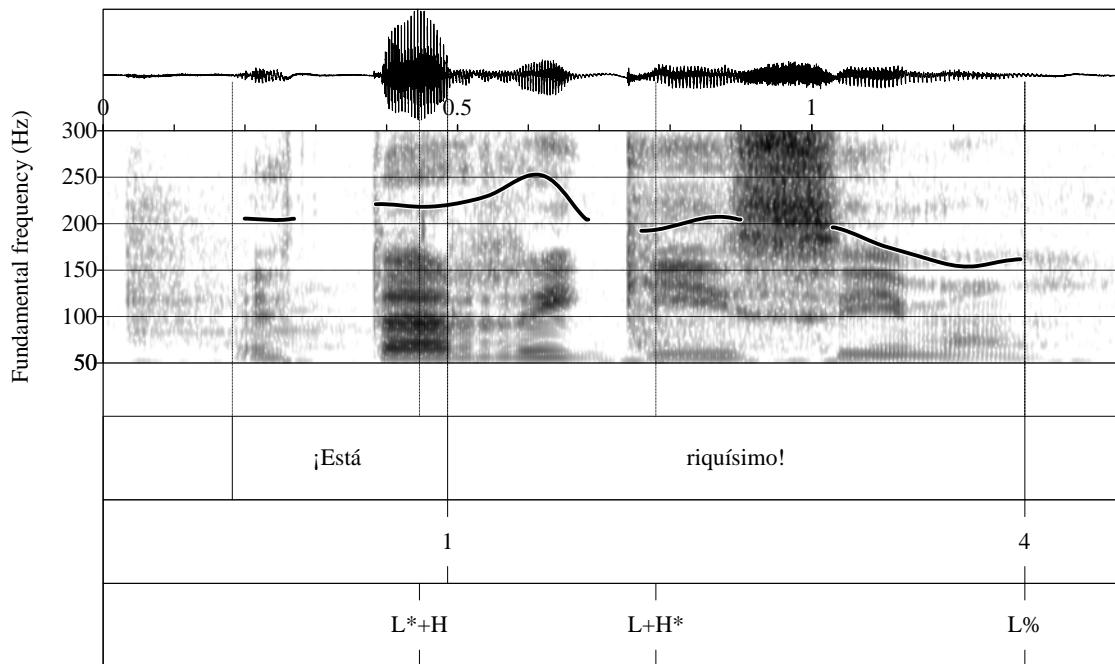


Figure 6: Waveform, spectrogram and F0 trace for the biased exclamative statement ¡Está riquísimo! ‘It’s really delicious!’ produced with a L^*+H prenuclear pitch accent, $L+H^*$ nuclear pitch accent and $L\%$ phrase boundary.

3.1.2.3. Statements of the obvious

Like other Spanish varieties, Puerto Rican Spanish has a distinct tune for statements of the obvious. Here the speaker uses a specific intonational contour that makes obvious the fact that she believed the propositional content of a given utterance to have been accessible to both her and her interlocutor prior to the time of utterance (i.e. shared in the speakers' common ground). The tune in figure 7 is used when just prior to the time of utterance the speaker becomes aware that her interlocutor does not in fact share this information. The temporal relationship between the time of utterance and the speaker becoming aware of the mismatch in common ground is a key pragmatic restriction for statements of the obvious, i.e. the speaker must have just found out about the common ground mismatch. Additionally, the speaker must have believed that the information in question was not only shared, but very accessible.

In this corpus, the nuclear configuration observed for statements of the obvious shows a rise throughout the stressed nuclear syllable to a peak, which occurs within this same syllable. In figure 7, the speaker reveals the identity of the father of a common friend's baby. The speaker was presented with a situation in which his interlocutor asked him who the baby's father was, which the speaker assumed to be obvious since the common friend had been dating her boyfriend, Mariano, for many years. Therefore, the speaker is incredulous with respect to her interlocutor's failure to calculate the identity of the father. The utterance in figure 7 shows the second of two intonational phrases: *¿De quién va a ser? ¡De Mariano!* 'Whose do you think it is? Mariano's!' In the statement of obviousness *¡De Mariano!* we find a L+H* pitch accent on the accented syllable *-ria-* followed by the complex boundary tone which is comprised of a fall and subsequent rise in the posttonic syllable, the complex boundary tone LM%. The nuclear configuration is L+H* LM%. The form-function relationship for this nuclear configuration seems to be common for many Spanish varieties, such as Mexican (de-la-Mota et al. this volume) Castilian (Estebas-Vilaplana and Prieto this volume) and Canarian Spanish (Cabrera Abreu and Vizcaíno Ortega this volume).

3.2. Questions

3.2.1. Yes-no questions

Yes-no questions in Caribbean Spanish varieties in general have traditionally been of interest in the literature given their 'radical' nature in lacking the F0 dip and final rise in nuclear position that we typically find for broad focus yes-no questions in Castilian, Mexican and Andean varieties, to name a few. Instead of this fall-rise, Puerto Rican Spanish is known to use a nuclear rise-fall to encode yes-no questions. Sosa (1999) lays out a dichotomy for yes-no questions in Caribbean versus non-Caribbean dialects in which yes-no questions are invariably produced with a falling *toneme* for varieties of the former group, but rising for the latter. For Sosa this is further evidence for a typological distinction between Caribbean and non-Caribbean dialects, in addition to the many segmental differences that Caribbean dialects have been known to share. Recent investigations in Caribbean Spanish, though, show that not all Caribbean dialects *categorically* employ a nuclear fall for yes-no questions (Willis 2004 for Dominican Spanish; Alvord 2006 for Miami Cuban Spanish). Additionally, as the intonational phonologies of an increasing number of dialects of Spanish are reported on, we find that many non-Caribbean dialects also encode yes-no questions with a final fall (see the chapters on Argentinian, Chilean and Cantabrian Spanish in this volume, for example). The use of a fall versus a rise for questions in Spanish varieties may depend on pragmatic restrictions (Escandell-Vidal 1998). The corpus investigated here, however, does confirm a general resistance in Puerto Rican Spanish against final rises for questions, though as we will see, a rise is indeed found in very restricted pragmatic contexts.

As Sosa notes, a circumflex movement dominates for yes-no questions in this variety as it does for declaratives. However, the general pitch height throughout the utterance is higher for yes-no questions. Like Castilian Spanish, we find that a L^{*}+H prenuclear pitch accent is used for yes-no questions. Yes-no questions tend to resist declination, not unlike the phenomenon to which Ladd (2008) refers to as the suspension of ‘downdrift’ in Hausa questions (though Hausa has downdrift in statements, while my corpus does not show evidence of downdrift for Puerto Rican Spanish statements). Suspension of downdrift can also be found in declaratives in the Spanish creole language Palenquero (Hualde and Schwegler, 2007) spoken in San Basilio de Palenque, Colombia. High, level tones are found on prenuclear stressed syllables instead of the rising prenuclear pitch accents typically found in Spanish declaratives. The F0 contour remains high throughout the utterance in Puerto Rican Spanish, not unlike the German ‘bridge contour’ in shape, with an initial rise followed by a sustained high F0 contour until a final fall (Wunderlich 1991). However, F0 suspension is not the only F0 contour found in Puerto Rican Spanish yes-no questions. It is also possible to find a gradual rise throughout the utterance to the high nuclear tone.

Puerto Rican Spanish broad focus yes-no questions exhibit an utterance-initial L^{*}+H prenuclear pitch accent which is typically followed by either tonal absence or ensuing H^{*} prenuclear accents (yielding the aforementioned F0 suspension) until final nuclear movement. A final nuclear fall is typically found for this utterance type. The fall initiates from a nuclear pitch accent, iH^{*}, whose peak may occur very early in the syllable nucleus or around its midpoint. It is rare to find the extra-high tone realized as a full plateau maintained throughout the duration of the entire syllable (as we find for H^{*} for some narrow focus statements, as shown in figure 3). The tone found in the tonic syllable is labelled iH^{*}, the diacritic indicating that this tone is upstepped. As with the case of declaratives, the relevant diacritic (i) does not indicate upstep relative to the pitch height of some preceding tone. Rather, it indicates that the tone is extra-high. It contrasts, for example, with the high tone (H^{*}) used in nuclear position for some narrow focus statements, (see figure 3). For the broad focus yes-no questions analysed here, the fall to the low boundary (L%) occurs within the tonic nuclear syllable, while the elbow is most often found in the posttonic. An example of a yes-no question produced with the iH^{*} L% nuclear configuration is shown in figure 8 with the phonetic implementation I have just described.

3.2.2. Biased yes-no questions

3.2.2.1. Echo yes-no questions

The nuclear configuration for echo questions in Puerto Rican Spanish is most typically a rise throughout the nuclear accented syllable to an upstepped high tone followed by a fall to a low boundary. Here the issue of scaling comes into play again, as it does in the case of broad focus yes-no questions versus broad focus statements. For echo questions, I use the label L+iH^{*} L% since it contrasts with narrow focus statements for which the peak of the starred high tone in L+H^{*} is produced lower in the speaker’s pitch range (i.e. not upstepped). With identification tasks, Borràs-Comes et al. (2010) used perception data and reaction times to argue for a categorical difference between two rising nuclear pitch accents in Catalan. They found a categorical distinction between affirmative or focalized statements (L+H^{*} nuclear pitch accent) and echo questions (L+iH^{*} nuclear pitch accent). The production data analysed here show a similar distinction. While the narrow focus statement in figure 4 shows a L+H^{*} nuclear pitch accent, the pitch scaling for the high tone in the echo question is much higher, resulting in a steeper fall to a low boundary tone. Figure 9 shows an example of a short echo question produced with the L+iH^{*} L% pitch accent. There is rise to a peak high in the speaker’s pitch range followed by a fall in the echo question *¿A las nueve?*

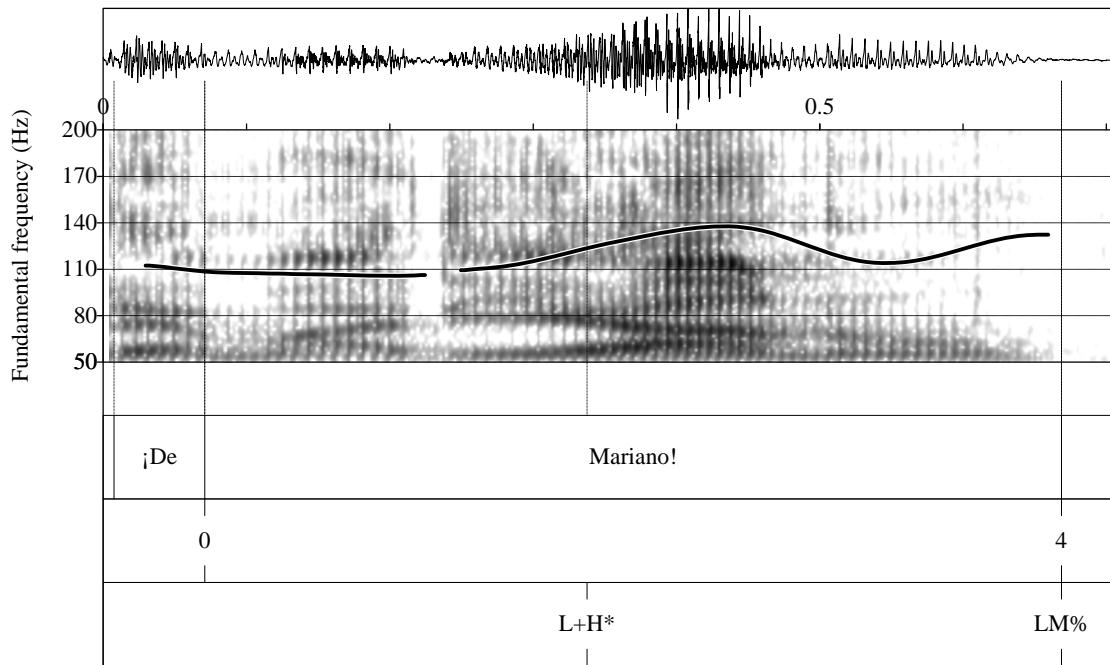


Figure 7: Waveform, spectrogram and F0 trace for the statement of obviousness *¡De Mariano!* 'Mariano's!' produced with a L+H* nuclear pitch accent before a LM% phrase boundary.

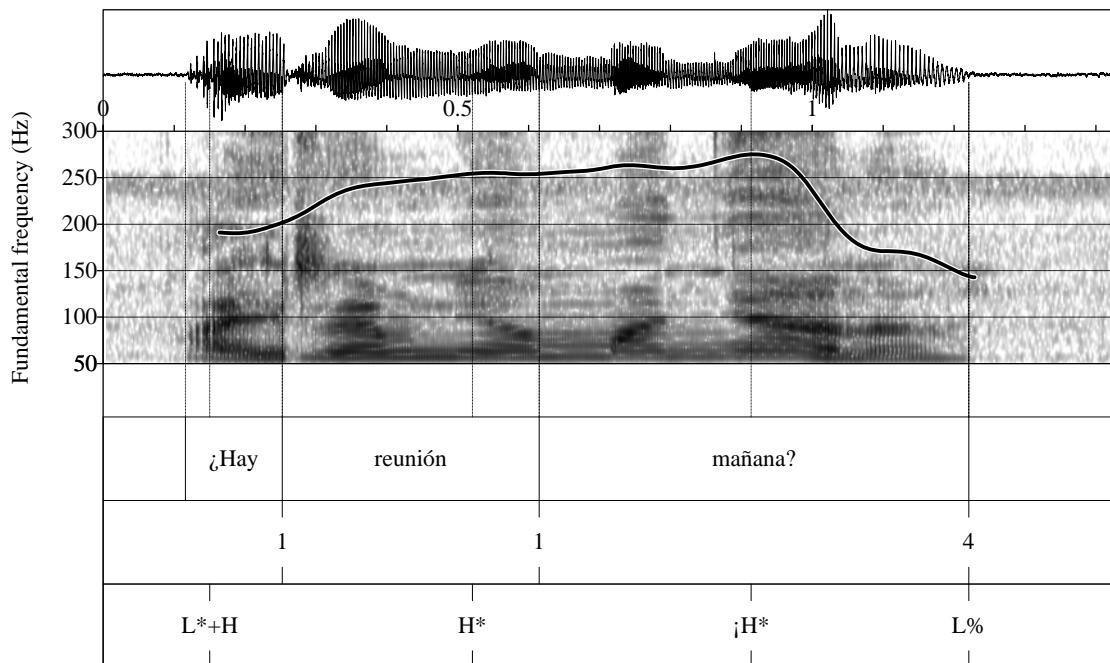


Figure 8: Waveform, spectrogram and F0 trace for the yes-no question *¿Hay reunión mañana?* 'Is there a meeting tomorrow?' produced with a iH* nuclear pitch accent and L% phrase boundary.

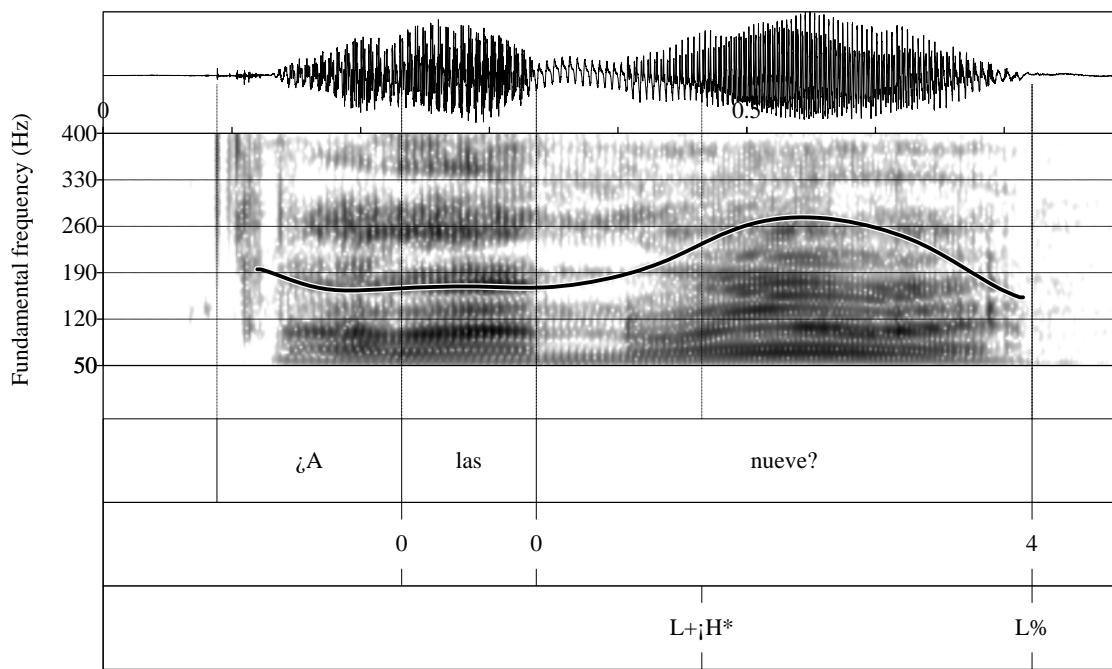


Figure 9: Waveform, spectrogram and F0 trace for the echo question *¿A las nueve?* 'At nine?' produced with the L+H* L% nuclear configuration.

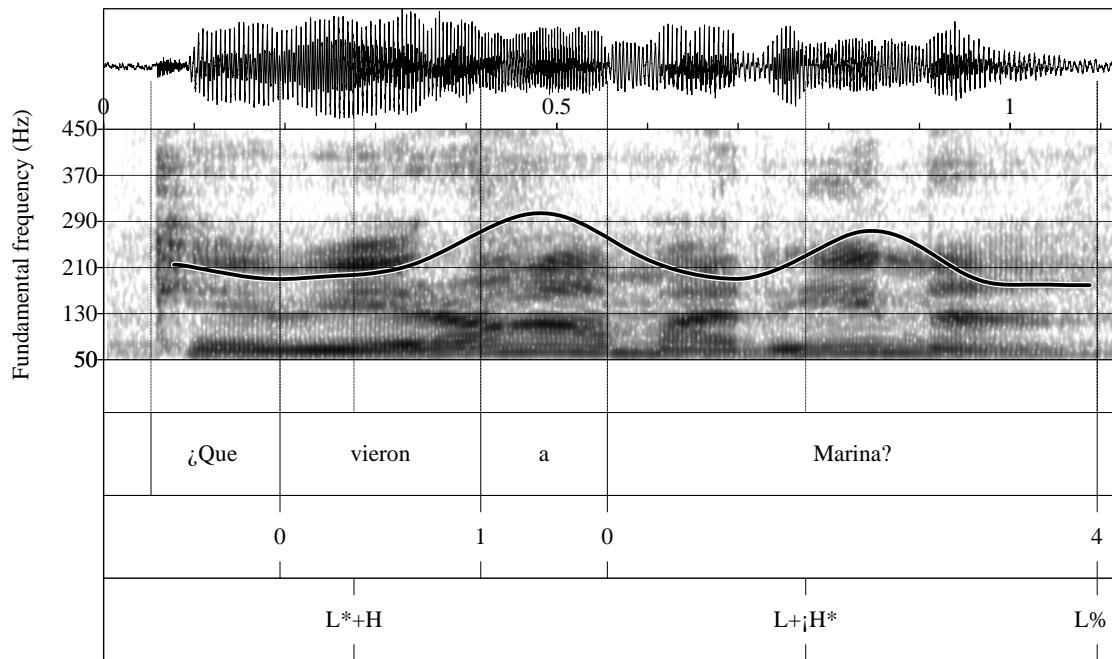


Figure 10: Waveform, spectrogram and F0 trace for the echo question *¿Que vieron a Marina?* 'You saw Marina?' produced with a L*+H prenuclear pitch accent followed by the L+iH* L% nuclear configuration.

Echo questions are often used to express the speaker's attitude towards the meaning of an utterance, including its presuppositions and implicatures (Noh 2005: 117). They not only question what the echoer has failed to hear, but also express his attitude towards what he has heard (Noh 2005: 132). It is common to find some notion of surprise or disbelief associated with echo questions in general. In the echo question *¿Que vieron a Marina?* we find a L^{*}+H prenuclear pitch accent on *vieron* followed by a L+¡H^{*} nuclear pitch accent on *Marina*. This specific flavour of echo question implies that the speaker is surprised about the propositional content, or that it goes against his/her expectations. Note that no F0 'bridge' is found after the prenuclear pitch accent, as we would expect in a broad focus yes-no question. Instead, after the prenuclear pitch accent on *vieron* the speaker targets a low tone produced near the baseline of the speaker's pitch range. We then find a rise throughout the nuclear accented syllable -*ri-* to a high tone produced high in the speaker's pitch range L+¡H^{*}, followed by a low boundary tone L%. By returning to the baseline area of the tonal space after realizing previous high tone in order to produce the nuclear L+¡H^{*}, the speaker conveys that the information she has just received is not in line with her expectations.

The F0 contour in figure 10 closely resembles the one presented by Sosa in his discussion of the San Juan focus contour, which he describes as the *tonema ascendente-descendente puertorriqueño*, specifically found in San Juan. He claims that the nuclear peak occurs within the stressed nuclear syllable, which he calls L^{*}+H L%. Sosa describes this nuclear configuration as circumflex in design, but distinguishes it from a second contour that also shows a rise-fall. However, differently from figure 10 the final peak coincides not with the accented nuclear syllable but rather with the onset of the posttonic syllable. The most striking characteristic of this *toneme* for Sosa is that the fall to the low boundary tone is never produced until the posttonic syllable. He points out a possible labelling issue for the contour, since the AM framework does not allow for pitch accents on unaccented syllables, whereas in this case the F0 peak indeed occurs in the posttonic syllable. Sosa's interpretation is that it is not the case that the posttonic syllable in fact becomes stressed, but rather that it shares the same peak with the stressed syllable. He argues therefore, that the H tone is then ambisyllabic on the surface level.

The data analysed in this chapter revealed a contour that seems to show the same utterance-final pitch movement as Sosa's ambisyllabic version in San Juan Spanish. These were found for questions of incredulity, when the speaker implicates that she is not willing to admit or accept the propositional content as true. They are different from the echo question shown in figure 11 because they also implicate doubt with respect to the propositional content, and are described in Section 3.2.3.2. I should point out that the contours described by Sosa were both used for exclamatives in San Juan Spanish. It is appropriate to note the semantic similarity between exclamatives and echo questions. Rett (2009) observes that the goal of a speaker in an exclamative is to show that she is surprised by the content of the utterance. Gutiérrez-Rexach (2008) points out that wh-exclamatives, for example, express emotive attitudes like amazement, surprise or other attitudes that are relevant to the context. I have also pointed out Noh's characterization of echo questions such that they allow the speaker an opportunity to express an emotion about what has just been heard (or even inferred). It is perhaps not surprising that we should find two kinds of echo questions implicating surprise and incredulity with intonational contours similar to the ones used for the exclamatives. While Sosa's account does not provide the context in which these exclamatives were produced, we might surmise that the speakers were expressing similar emotive attitudes to those expressed by speakers when they produced L+¡H^{*} L% in

figure 10 or when they realized the bitonal boundary tone HL% for incredulity echo question which is shown in figure 11. Incredulity questions are produced quite consistently with the L* HL% nuclear configuration.

The incredulity echo question in figure 11, *¿Que Mario se postuló para alcalde?* is produced with a L*+H prenuclear pitch accent. At the end of the utterance, a low plateau is found during the stressed syllable of *alcalde* followed by a subsequent rise and final fall in the posttonic syllable *de*, much like Sosa's description of the San Juan focus contour with an ambisyllabic high peak. However, with the incorporation of complex boundary tones proposed in Estebas-Vilaplana and Prieto (2008), there is no longer a need to treat the H tone found in the posttonic as ambisyllabic, since it can now be analysed as the first of two pitch movements in the posttonic syllable. Hence, the bitonal boundary tone is labelled HL%. This nuclear configuration is described here as L* HL%. The pragmatic difference between this sort of echo question and the incredulity echo question shown in figure 10 is the element of doubt implicated in figure 11. The incredulity contour doubts the veracity of the propositional content while the contour in figure 10 implicates that the information is contrary to the speaker's expectations. The speaker is in a state of incredulity at the time of the utterance. In Puerto Rican Spanish, incredulity is implicated through use of the nuclear configuration L* HL%. These sorts of questions are necessarily confirmatory, since the speaker is typically incredulous to some information that has recently been activated either linguistically or extra-linguistically.

3.2.2.2. Imperative yes-no questions

As I indicated earlier, Puerto Rican Spanish strongly resists nuclear configurations ending with a high boundary tone, though they can be found in quite restricted pragmatic contexts. Imperative questions and polite questions are examples of such a context. The F0 contour shown in figure 12 *¿Puedo pasar?* was elicited for a situation in which the speaker was asking a doctor for permission to enter his office. We can also assume that for this utterance there may be an element of deference to be considered. Figure 12 shows the pitch track for the utterance *¿Puedo pasar?* produced with a L*+H prenuclear pitch accent. After the rise from the prenuclear pitch accent we find another small rise to an extra-high target on the stressed syllable of the word *pasar* iH*. A sustained high tone is found in the posttonic syllable, followed by a high boundary tone H%. Note the difference in the phonetic realization of the iH* pitch accent when followed by a high phrase boundary. Unlike broad focus yes-no questions, where the extra-high tone is not usually maintained as a plateau throughout the tonic nuclear syllable due to the following low phrase boundary, we do find that the phonetic implementation of iH* when followed by HH% is that of a high plateau maintained throughout the vowel's duration. The iH* HH% configuration is also used for imperative yes-no questions.

The use of H* H% in polite questions in Puerto Rican Spanish is an interesting finding, considering the strong preference for low final boundary tones in questions for this variety of Spanish, typically associated with Caribbean dialects in general. This contour is also used for imperative questions in Canarian Spanish. However, it should be noted that one of the contours used for broad focus yes-no questions, H* L%, can also be found in imperative questions.

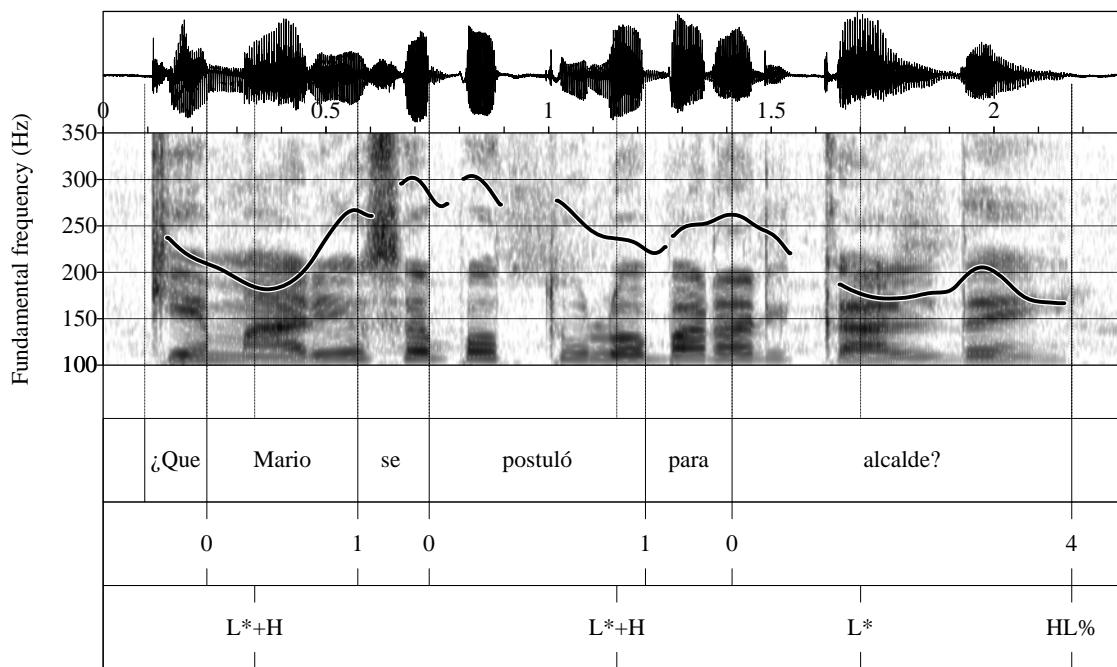


Figure 11: Waveform, spectrogram and F0 trace for the incredulity echo question *¿Que Mario se postuló para alcalde?* ‘*Mario is running for mayor?*’ produced with two L^*+H prenuclear pitch accents followed by the L^* $HL\%$ nuclear configuration

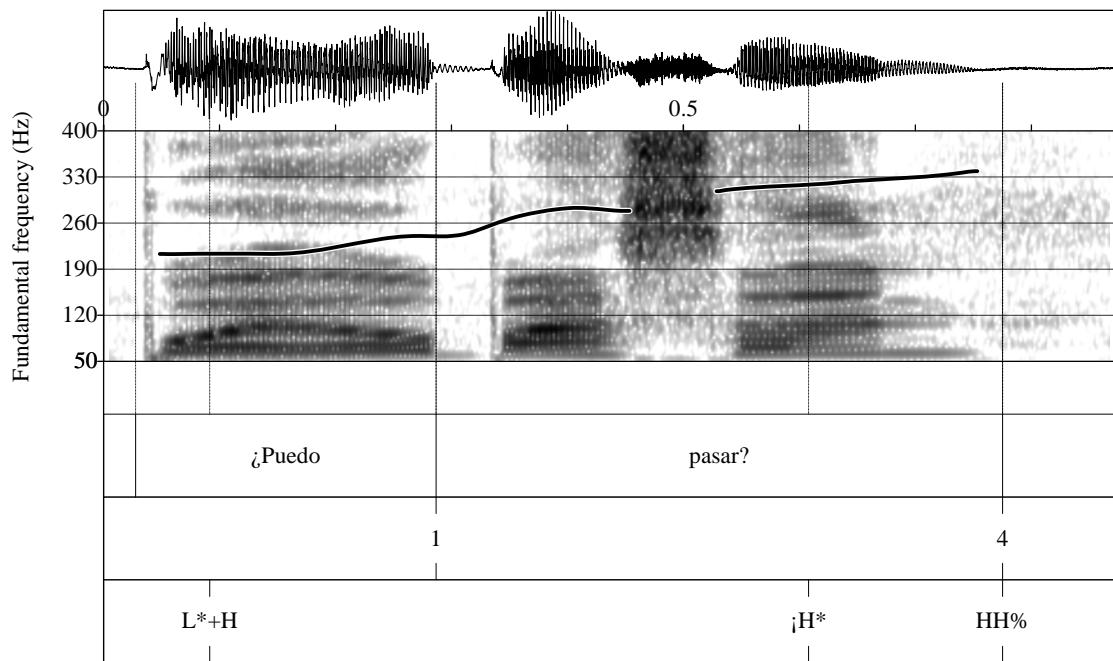


Figure 12: Waveform, spectrogram and F0 trace for the polite question *¿Puedo pasar?* ‘*Can I come in?*’ produced with a L^*+H prenuclear pitch accent, H^* nuclear pitch accent and $HH\%$ phrase boundary.

3.2.2.3. Confirmation yes-no questions

In Puerto Rican Spanish, a specific contour is used to confirm information that the speaker believes to be true. I will refer to these as positive confirmation questions. In the second study reported on here, speakers produced questions that differed in speaker belief states about the propositional content of the question. When speakers produced a confirmation question about information they believed to be true at the time of utterance, the question tended to be produced with a fall through the nuclear accented syllable to a low target, labelled H+L* L%. The alignment of this pitch accent is implemented such that the fall from a high tone begins in the pretonic syllable of the utterance-final prosodic word. The low target is reached in the tonic syllable. This contour was not found when the speaker did not have any specific belief about the propositional content; the iH* nuclear pitch accent was used, as expected, since this accent already found to be preferred for broad focus yes-no questions.

In the context for the question produced in figure 13, the speaker asks *¿No hay por aquí un lugar que vende piononos?* ‘Isn’t there a *piononos* place around here?’ The participants were told in the preceding context before producing the target utterance that they believed that there was indeed a place nearby that sold *piononos*.³ Therefore, the propositional content ($p =$ there is a place that sells *piononos*) in the utterance is believed to be true by the speaker. In figure 14, the speaker asks if there is a place that sells *piononos*, with no specific expectation about whether or not there is such a place. Note that for the two different questions, the speakers’ beliefs about the existence of a place that sells *piononos* is also marked by mood choice. The confirmation question in figure 13 uses the indicative form *vende* of the verb *vender* ‘to sell’, while the broad focus yes-no question is marked with subjunctive mood, *venda*. In this way the speaker implicates that the existence of the place that sells *piononos* is realis in the confirmation question, but not in the broad focus yes-no question.

The difference in question type is reflected by nuclear pitch accent choice. For the positive confirmation question in figure 13, we see that the F0 is already falling at the onset of the syllable and that the fall is quite shallow in the realization of the H+L* nuclear pitch accent. Figure 14 shows a typical broad focus yes-no question, as discussed in Section 3.2.1. It is not uncommon to find longer duration for the accented nuclear syllable in the positive confirmation question than we find for the broad focus yes-no question. For instance, when comparing figures 13 and 14, which were produced by the same speaker, we find that the duration of the nuclear accented syllable *no* for the positive confirmation question is 201 ms, while the same segmental string in the broad focus question has a duration of 182 ms.

The second questionnaire also explored a context in which the speaker, by inference, found out that some proposition was not true. In figure 15, the speaker has just found out by inference that there is no place close by that sells *piononos*. This target was produced as part of a dialogue, and the speaker infers the propositional content of her question from her interlocutor’s statement *Vamos a tener que ir a Piñones para comprar piononos. En este barrio va a ser difícil.* ‘We’re going to have to go to Piñones to buy *piononos*. It’ll be difficult [to do so] in this neighborhood.’ Therefore, when the speaker produces the utterance *¿Por aquí no hay ningún lugar que venda piononos?* ‘There’s no place that sells *piononos* around

³ *Piononos* are a fried food common in Puerto Rico.

here?', s/he confirms the negation of the proposition ($p =$ there is a place nearby that sells *piononos*), which s/he has just inferred (see Ladd, 1981 and Büring and Gunlogson 2000 for semantic/pragmatic discussions). While she was never told explicitly 'There are no places that sell *piononos* around here', her interlocutor's utterance provides ample evidence that there are no places that sell *piononos* close by. In this context, speakers often produced the same nuclear configuration used for echo questions, $L+H^* L\%$.

From a pragmatic point of view, the use of $L+H^* L\%$ for this type of confirmation question is not surprising since echo questions themselves confirm/check information that has been explicitly activated in the discourse. For this specific situation, while the information being confirmed is not explicitly stated in the discourse (which is sometimes the case for echo questions), it is very easily accessible and therefore highly activated (see Dryer 1996). While the speaker does not echo verbatim what her interlocutor stated, she echoes instead what she infers from the prior utterance, i.e. 'the unsaid' (Grice 1975). Figure 15 shows an example of a confirmation question for which the speaker shows surprise, as if she had previously expected there to be a place that sells *piononos* nearby, but finds out through inference that there is not. The speaker uses the $L+H^*$ nuclear pitch accent, with a rise throughout the nuclear accented syllable to a high peak produced higher in the speaker's pitch range than the high peak in the narrow focus statements for which speakers use $L+H^*$, as I have discussed in section 3.2.2.1. As in figure 10, the implication of counterexpectation in this question is apparent due to the realization of the low tone of the nuclear pitch accent around the baseline of the speaker's pitch range. Additionally, in broad focus yes-no questions we would expect to find an initial L^*+H prenuclear accent followed either by tonal absence or H^* pitch accents on the content words throughout the question, allowing for declination suspension (a flat, high contour). Here an initial L^*+H prenuclear accent is used, but followed by the $L+>H^*$ prenuclear pitch accents which are found on the quantifier *ningún* and the verb *venda*. Recall the use of the $L+>H^*$ prenuclear pitch accent in narrow focus statements as well.

As seen in the previous sections, Puerto Rican Spanish favours low final boundary tones, with the exception of some polite and imperative questions. Another exception is tag questions, which also confirm information. The most common nuclear configuration for tag questions in Puerto Rican Spanish is phonetically realized as a low plateau followed by a rise to a high level, labelled as $L^* H\%$. Figure 16 shows the utterance Vienes a comer, ¿verdad? The fall-rise typical of tag questions in Puerto Rican Spanish is found on the tag word verdad where we find a F0 dip to a low target in the nuclear syllable -dad followed by a rising movement to a high final boundary tone. This nuclear configuration is labelled $L^* H\%$. The fall-rise is very restricted, then, in Puerto Rican Spanish relatively to other dialects of Spanish that use it to encode broad focus yes-no questions.

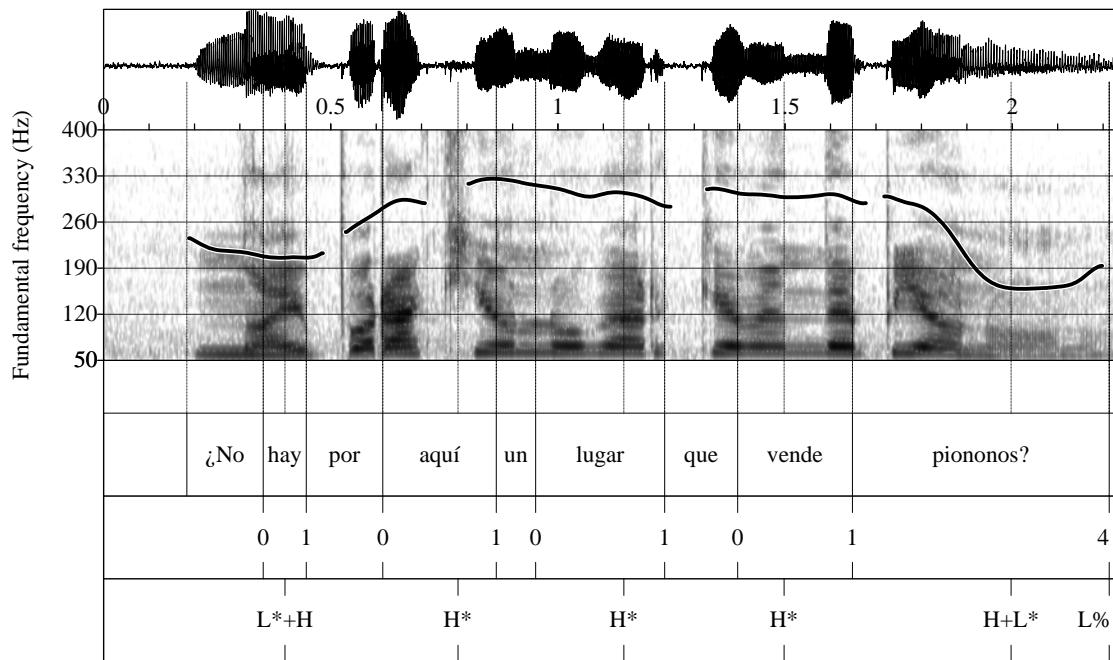


Figure 13: Waveform, spectrogram and F0 trace for the positive confirmation question *¿No hay por aquí un lugar que vende piononos?* ‘Isn’t there a place that sells piononos around here?’ produced with a H+L* nuclear pitch accent and L% phrase boundary.

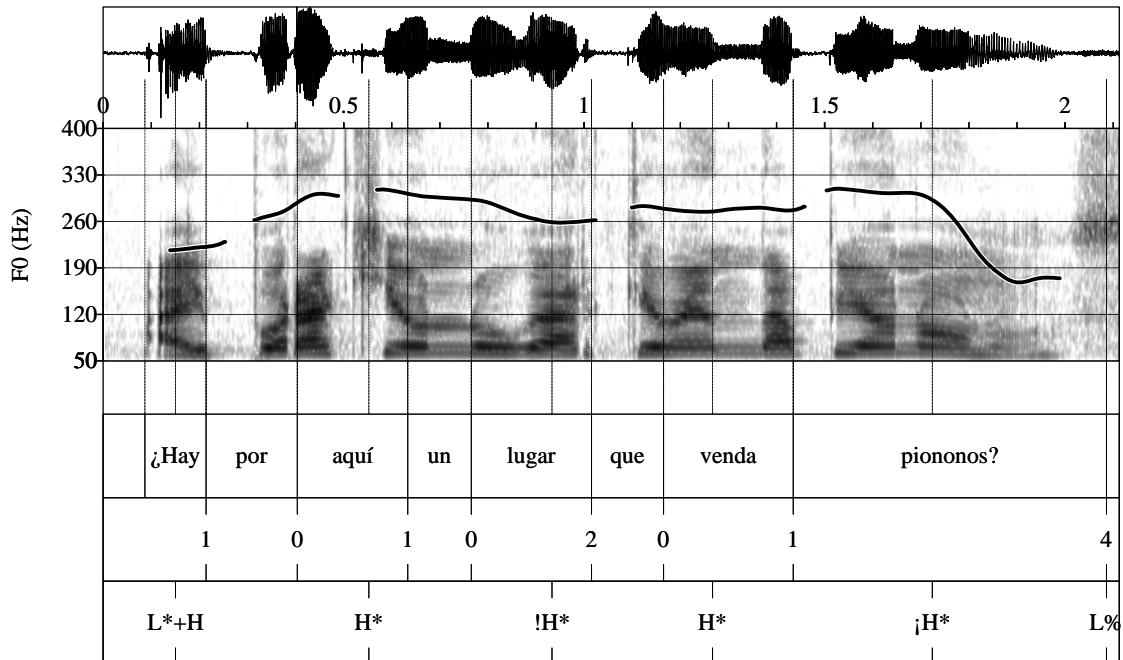


Figure 14: Waveform, spectrogram and F0 trace for the broad focus yes-no question *¿Hay por aquí un lugar que venda piononos?* ‘Is there a place that sells piononos around here?’ produced with a iH* nuclear pitch accent and L% phrase boundary.

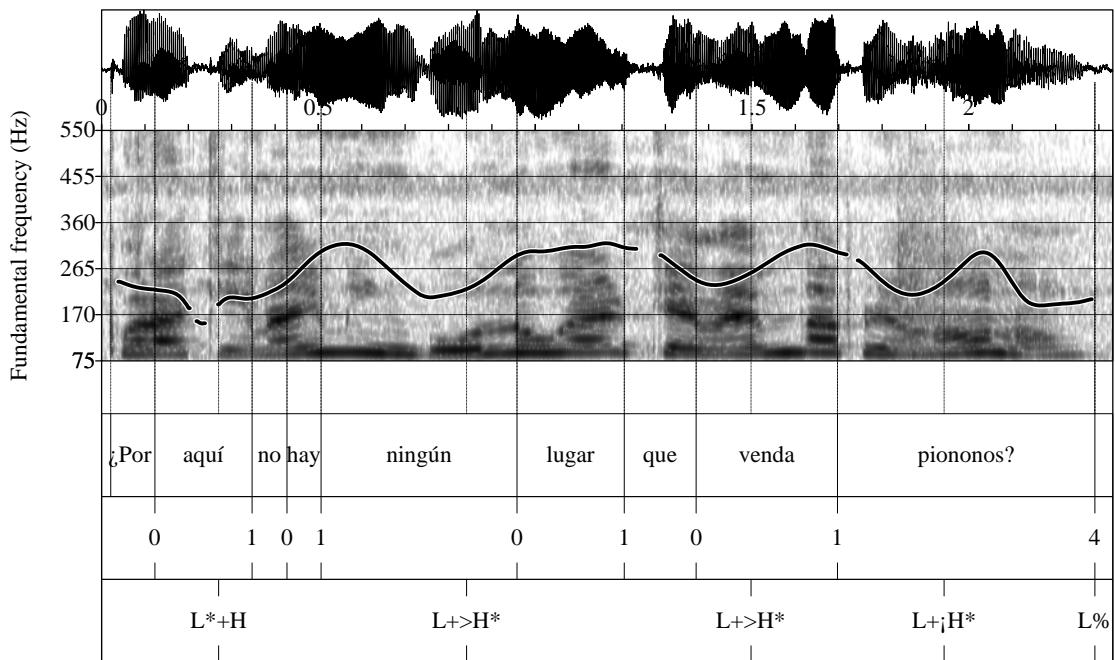


Figure 15: Waveform, spectrogram and F0 trace for the incredulity confirmation question *¿Por aquí no hay ningún lugar que venda piononos?* ‘There isn’t a place that sells piononos around here?’ produced with an initial L*+H prenuclear pitch accent and followed by L+>H* prenuclear pitch accents. The nuclear configuration is L+iH L%.

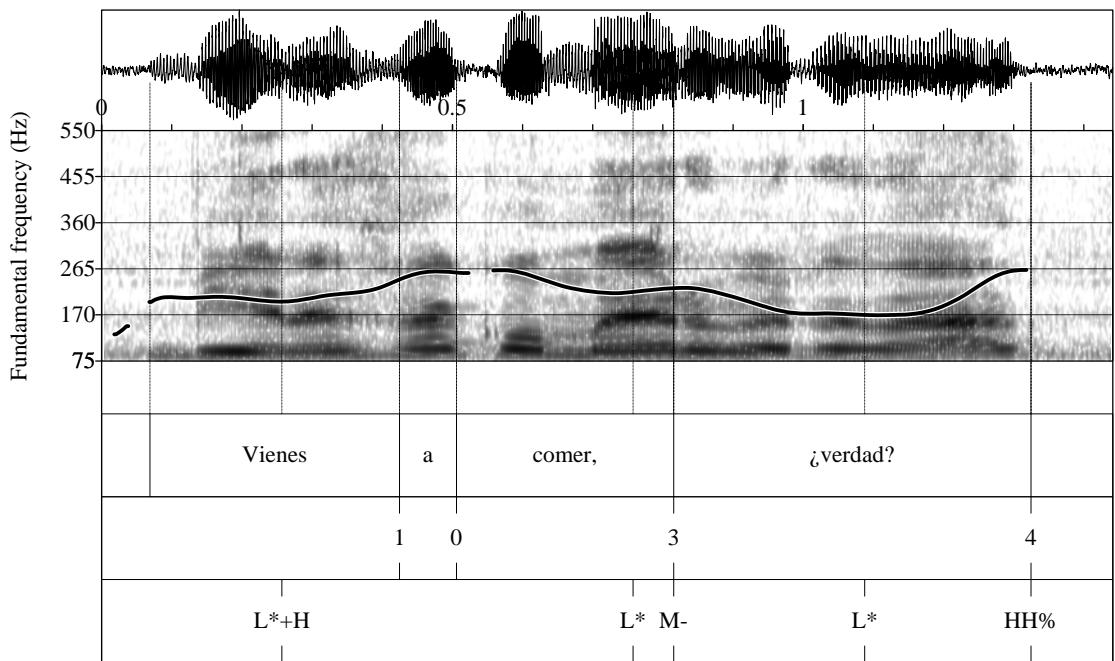


Figure 16: Waveform, spectrogram and F0 trace for the confirmation question with tag *Vienes a comer, ¿verdad?* ‘You’re coming to eat, right?’ produced with a L* HH% nuclear configuration.

3.2.3. Wh- questions

Navarro Tomás (1944) distinguishes between three pragmatically different types of wh-questions in Spanish (referred to in the literature as *preguntas pronominales*): falling, rising and circumflex. The first is described as the 'unmarked' type of wh- question, the second is described as more affected, showing insecurity (more polite). The third also allows for emotive expression, showing some element of surprise, but can also show special 'emphasis'. Quilis' characterization of wh- questions in Puerto Rican Spanish is a gradual descent from the peak in the first half of the phrase to its final portion, and for this reason he points out their similarity to declarative utterances that show a gradual descent. Later, when comparing Puerto Rican to Mexican and Canarian Spanish, Quilis (1993) states that all three dialects present a falling intonation pattern for wh- questions. In the figures presented for Quilis' Puerto Rican Spanish speakers, no circumflex movement is observed, rather the F0 falls throughout the utterance. However, Sosa's (1999) example of a wh- question does not exhibit the gradual fall throughout the utterance for wh- questions reported by Quilis. After an utterance-initial rise (described by Sosa as H^{*}+H) no declination is observed, but rather the pitch remains high, to finally fall within the stressed nuclear syllable (like the 'bridge contour' mentioned in Section 3.1). This 'suspension' in declination is what Sosa maintains is the characteristic which distinguishes Puerto Rican Spanish from other dialects (e.g. Caracas Spanish) that exhibit a gradual fall throughout the utterance for wh- questions. This volume, however, reveals that F0 suspension for wh- questions is also found in Dominican and Canarian Spanish.

Nevertheless, the data presented here lend some support to some of the claims mentioned above. In support of Sosa's argument, the wh- questions analysed here do not show any examples of the gradual fall reported by Quilis. The most typical nuclear configuration for wh- questions found in the database is the H+L^{*} pitch accent followed by a low boundary tone L%, the same nuclear configuration that I have described for positive confirmation questions (though with different phonetic implementations). The H+L^{*} L% contour fits in with Navarro Tomás' circumflex description, since the pitch accent can be considered 'rising-falling'. However, the contour does not follow the pragmatic restrictions described by Navarro Tomás, since it seems to be the default contour used for wh- questions in Puerto Rican Spanish (which for Navarro Tomás would be the gradual fall contour). Again, Puerto Rican Spanish resembles both Canarian and Dominican Spanish in its use of nuclear pitch accent for wh- questions. Like Dominican Spanish, Puerto Rican Spanish often times shows either no pitch accents or H^{*} pitch accents between the initial rise of the question and the nuclear pitch accent, resulting in a high plateau throughout the question until the final fall.

The prenuclear accent for Puerto Rican Spanish wh- questions is typically L^{*}+H. A pitch accent may or may not be found on the question word. Figure 17 shows the utterance *¿Dónde tú vives?*, an example of a typical wh- question in Puerto Rican Spanish with two pitch accents: a L^{*}+H prenuclear pitch accent on the word *dónde* and a H^{*} on *tú*. Utterance-finally we find the H+L^{*} L% nuclear configuration, which occurs in the last word, *vives*.

Rising contours were also identified for wh- questions in the data, though they were much less common than the nuclear fall. A rising contour for wh- questions is described by Sosa (2003) for 'reminder' or 'reprise' wh- questions. Sosa discusses the use of rising contours for reprise questions in dialects like Colombian and Puerto Rican Spanish, pointing out that the speaker does not use a final rise for the wh- question to implicate politeness or mitigation, as might be expected. Rather, he characterizes the contour as implicating: 'tell me again something you may have already told me' (p. 240). The reprise wh- question, then,

reactivates previously asserted information.

Figure 18 shows the utterance *¿Qué dices que te dieron?* ‘What did you say they served you?’ elicited for a context where the speaker asks for confirmation about what her interlocutor was served at a restaurant. In this situation, the speaker focuses on something that had already been said in the discourse, asking for a reactivation of what had already been said with the wh- question. I consider this a reprise wh- question. Sosa (2003) also documents the use of rising pitch for reprise questions in his Puerto Rican Spanish data. The data analysed here confirm Sosa’s claim. This intonational strategy seems to be common across dialects. Both Canarian Spanish and Venezuelan Andean Spanish present a rise for this type of question, though they differ in the point of onset of the rise in the question. In figure 19 the prenuclear pitch accent L*+H is found on the word *dices*. A dip in F0 is found on the stressed syllable of the utterance-final word *dieron* followed by a high rise (HH%).

3.2.4. Biased wh- questions

3.2.4.1. Echo wh- questions

Wh- echo questions clarify a previously (and recently) uttered wh- question and, as Noh (1995) has argued for all echo questions, are metarepresentational. Hence wh- echo questions are more restricted than reprise wh- questions in terms of the type of utterance they respond to—the reprise wh- question responds to a prior utterance which can be of any type (statement, question, etc.) and can be located farther back in the discourse, while the wh- echo responds to a wh- question which is typically uttered in a prior turn. While speakers may opt for the typical H+L* L% wh- question contours for wh- echo questions too, the L+jH* L% nuclear configuration used for yes-no echo questions may also be used. This is phonetically realized as a rise throughout the stressed syllable to a high peak within the nuclear stressed syllable followed by a fall to a low boundary. For the wh- echo question *¿Adónde voy?* (Where am I going?) in figure 19, a L+>H* prenuclear pitch accent is produced on *adónde* with the high target produced in the posttonic syllable *de* followed by a pitch movement to the leading low tone in the L+jH* pitch accent.

3.2.4.2. Rhetorical wh- questions

A variety of patterns can be found for rhetorical wh- questions. The first rhetorical wh-question pattern I will show presents the same nuclear configuration used for statements of the obvious, L+H* LM%, as shown in figure 7 for the question *¿Qué harían sin mí?* ‘What would you (plural) do without me?’ This utterance was produced in a context where the speaker was told that she had asked her co-workers to perform a task before she left work, but when she gets back she discovers that they are still waiting for her to help them do it (i.e. they weren’t capable of performing the task without her). She then asks them rhetorically what they would do without her and therefore does not necessarily expect an answer to the question. The semantic similarity between this contour and the statement of the obvious is perhaps not so surprising, since it is in fact obvious in the context that the co-workers aren’t capable of doing the task without the speaker, i.e. it is obvious that without the speaker, the task would not be performed. It is also worth noting that other native speakers judged the speaker as sounding ‘ironic’ in this specific case. In figure 20, a L+>H* prenuclear accent is found on the accented syllable in *harían* with a rise throughout the syllable and a high peak in the posttonic. The nuclear pitch accent is a L+H* with a rise to a high peak realized within the syllable. The nuclear pitch accent is followed by a fall to a low

target and short rise to a mid boundary tone, resulting in the complex boundary tone LM% as shown in figure 20. This particular realization of the rhetorical wh- question is interpreted as ironic.

The rhetorical wh- question shown in figure 21 is quite interesting in that it exhibits a post-focal tonal reduction. Thus far, the most perceptually salient word of all the examples I have shown has been utterance-final, and therefore the nuclear pitch accent has been found on the very last word of the utterance. This is expected for Spanish (Hualde 2007, O'Rourke 2005). However, the example in figure 21 shows a *retraction* of nuclear pitch accent (Hualde, ibid). In the question *¿Qué harían sin mí?*, we expect to find the nuclear pitch accent on the utterance-final word *mí* as in figure 20. However, the most perceptually salient pitch accent in this utterance, as well as the most dramatic pitch movement, is located on *harían*, not *mí*. The L+H* nuclear pitch accent is found on the nuclear accented syllable of *harían* with a subsequent low, flat F0 contour ending in a low boundary tone L%. There still seems to be prominence on the utterance final word *mí* but it is produced within a low and compressed tonal space. I have labelled the utterance-final word *mí* with a L* pitch accent. Tonal reduction is also found in wh- questions in Argentinian Spanish (this volume), for which case the authors also made the decision to label the utterance-final word with a L*. Willis (this volume) also shows evidence for a possible retracted pitch accent in a Dominican Spanish wh- question, likewise labelling the utterance-final word with L*.

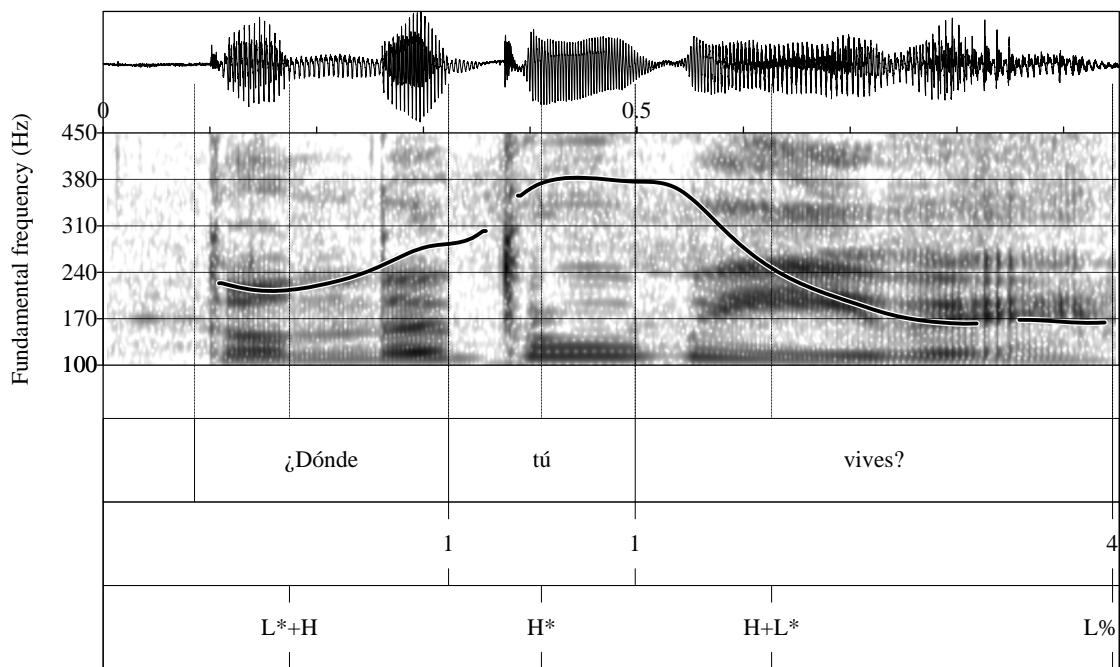


Figure 17: Waveform, spectrogram and F0 trace for the information-seeking wh- question *¿Dónde tú vives?* ‘Where do you live?’ produced with a L*+H prenuclear pitch accent and H* prenuclear pitch accent and followed by the H+L* L% nuclear configuration.

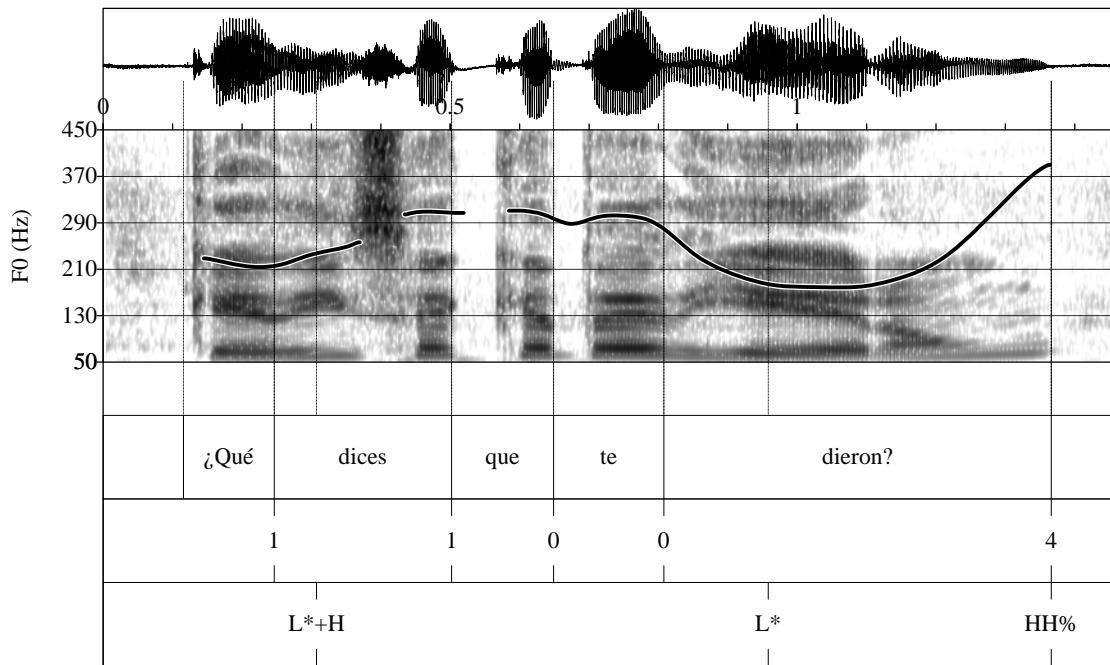


Figure 18: Waveform, spectrogram and F0 trace for the reprise wh- question *¿Qué dices que te dieron?* ‘What did you say they served you?’ produced with a L^*+H prenuclear pitch accent followed by the $L^* \text{ HH}%$ nuclear configuration.

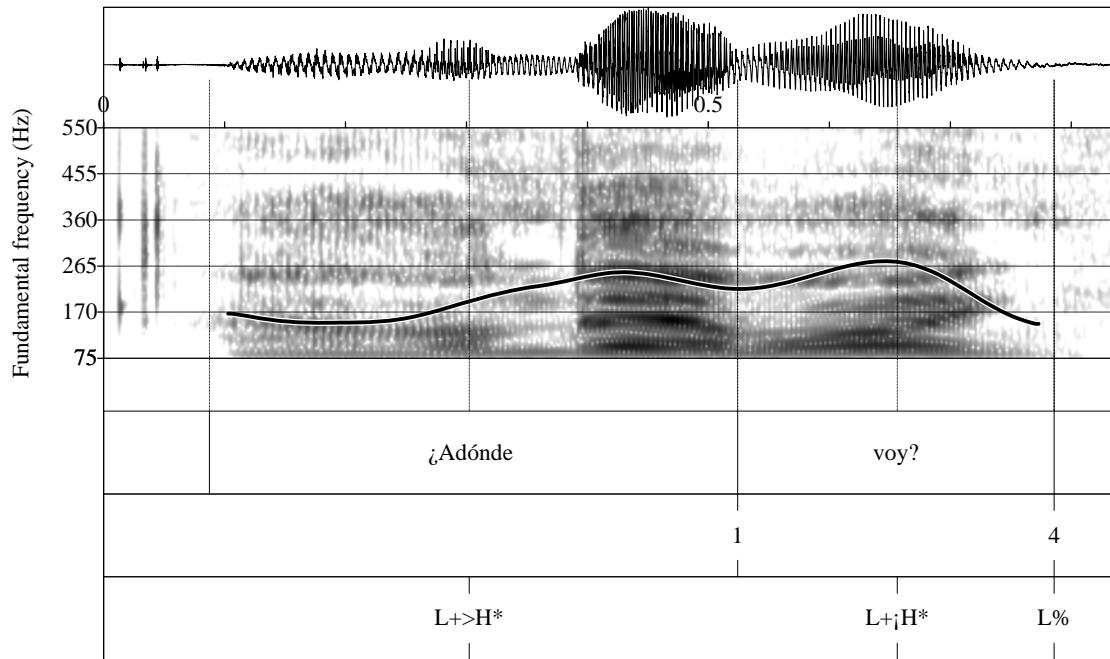


Figure 19: Waveform, spectrogram and F0 trace for the echo wh- question *¿Adónde voy?* ‘Where am I going?’ produced with a $L+>H^*$ prenuclear pitch accent followed by the $L+iH^* L\%$ nuclear configuration.

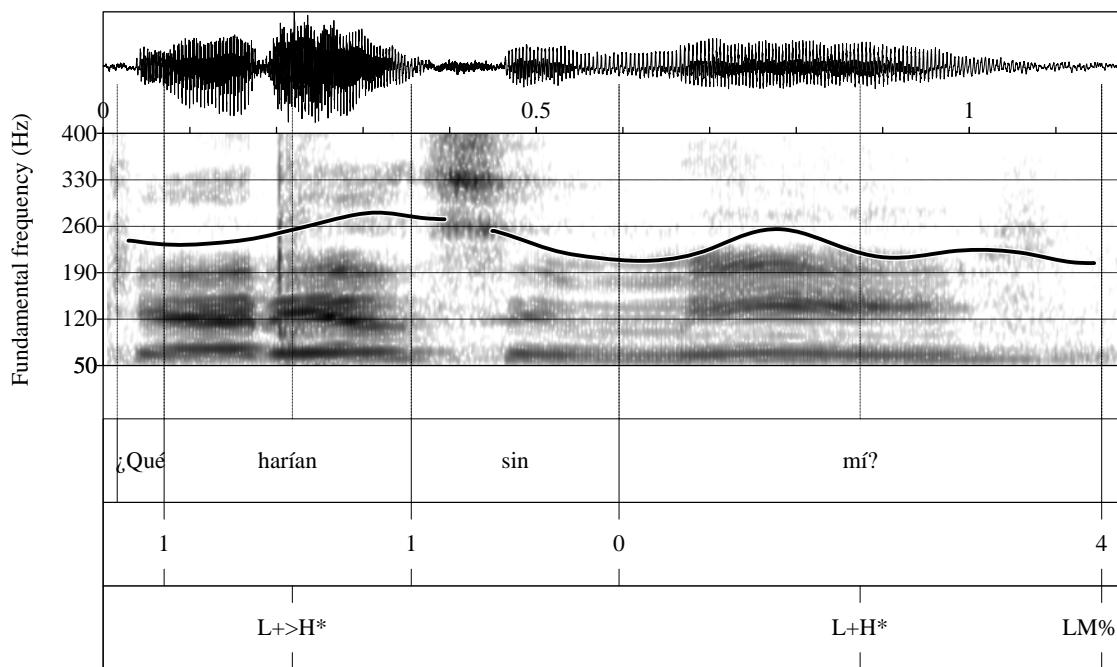


Figure 20: Waveform, spectrogram and F0 trace for the rhetorical wh- question *¿Qué harían sin mí?* ‘What would you do without me?’ produced with a L+>H* prenuclear pitch accent followed by the L+H* LM% nuclear configuration.

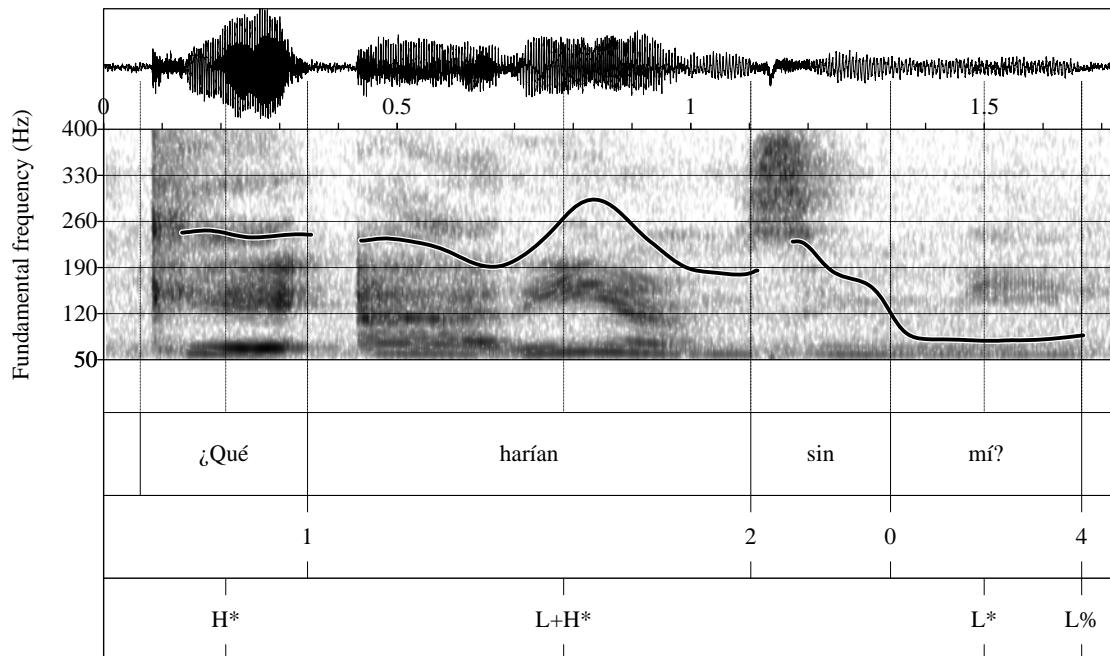


Figure 21: Waveform, spectrogram and F0 trace for the rhetorical wh- question *¿Qué harían sin mí?* ‘What would you do without me?’ produced with H* prenuclear pitch accent followed by a retracted L+H* nuclear pitch accent.

3.3. Imperatives: commands and requests

3.3.1. Commands

Jespersen (1954) defines an imperative as a brutal or humble request to the hearer to do something. The situation used to elicit figure 22 is one in which the speaker is asked to pretend to be the receptionist in a hotel and tells some guests to fill out a form. The target utterance is obviously a polite request, i.e. ‘humble’ in Jespersen’s terms. The contour found for this utterance was common for polite imperatives. In figure 22 we find L* on the penultimate, stressed syllable in the word *formulario* followed by a rise in the post-accented syllable to a mid boundary (M%) in the utterance *Completen por favor este formulario*.

3.3.2. Requests

Exhortative requests show a very specific intonation contour as well. In the utterance depicted in figure 23, *iVente!*, the speaker tries to convince her interlocutor to accompany her to the movies. This utterance shows the typical intonation pattern used for exhortative requests, a flat low tone (L*) in the first syllable of *vente*, which is the stressed nuclear syllable (and which undergoes substantial lengthening) followed by a complex boundary tone that rises within the post-accented syllable and then falls. This is transcribed as HL%. This tune is phonologically identical to that of incredulous confirmation questions, though the phonetic implementation may differ. For instance, the tonic syllable in exhortative requests tends to be longer than that of incredulous confirmation questions.

3.4. Vocatives

A vocative calling contour not unlike those used in other languages as well as other dialects of Spanish is shown in figure 24. This utterance, *iMarina!*, is characterized by a L+H* pitch accent, which is followed by a slight fall resulting in a mid tone that is sustained until the end of the utterance. This sustained mid tone is labelled M%, based on the complex boundary tone proposed by Prieto and Estebas-Vilaplana (this volume) for Castilian Spanish, as well as the one proposed by Prieto (in press) for Catalan.

Another possible vocative call in Puerto Rican Spanish is shown in figure 25. This is noticeably different from the chant shown in figure 24 in terms of both the pitch accent and the boundary tones. This contour shows the L+H* HL% nuclear configuration, which is phonetically realized as a rise during the last accented syllable that continues into the following syllable, followed by a fall in pitch to a low level. Therefore in the utterance in figure 25 *iMarina!* we find a rise throughout the accented syllable *-ri-* that continues into the posttonic syllable *-na* and finally falls to a low boundary. This contour is more insistent than the contour shown in figure 24. An important distinction that should also be noted is that for the call in figure 24, listeners infer from the contour that the speaker does not know whether the interlocutor is close to her or not (like in a game of hide-and-seek). For the insistent contour in figure 25, the speaker knows her interlocutor is nearby. This is a fundamental distinction in how the two contours are inferred by speakers.

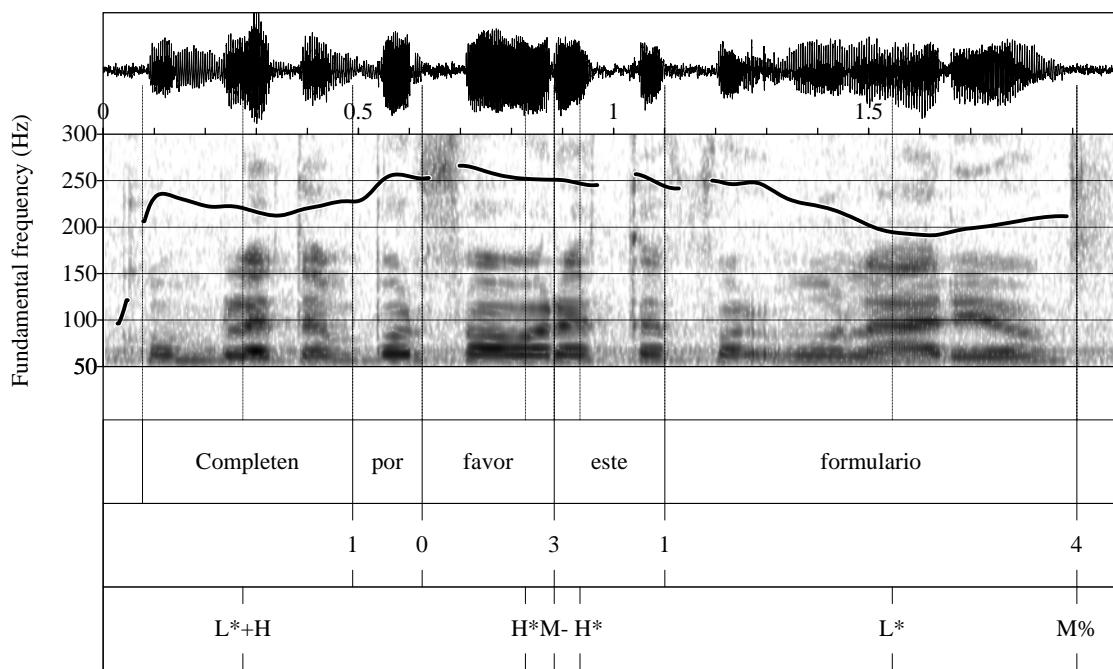


Figure 22: Waveform, spectrogram and F0 trace for the imperative Completén por favor este formulario ‘Please fill out this form’ produced with a L* nuclear pitch accent followed by M% boundary tone.

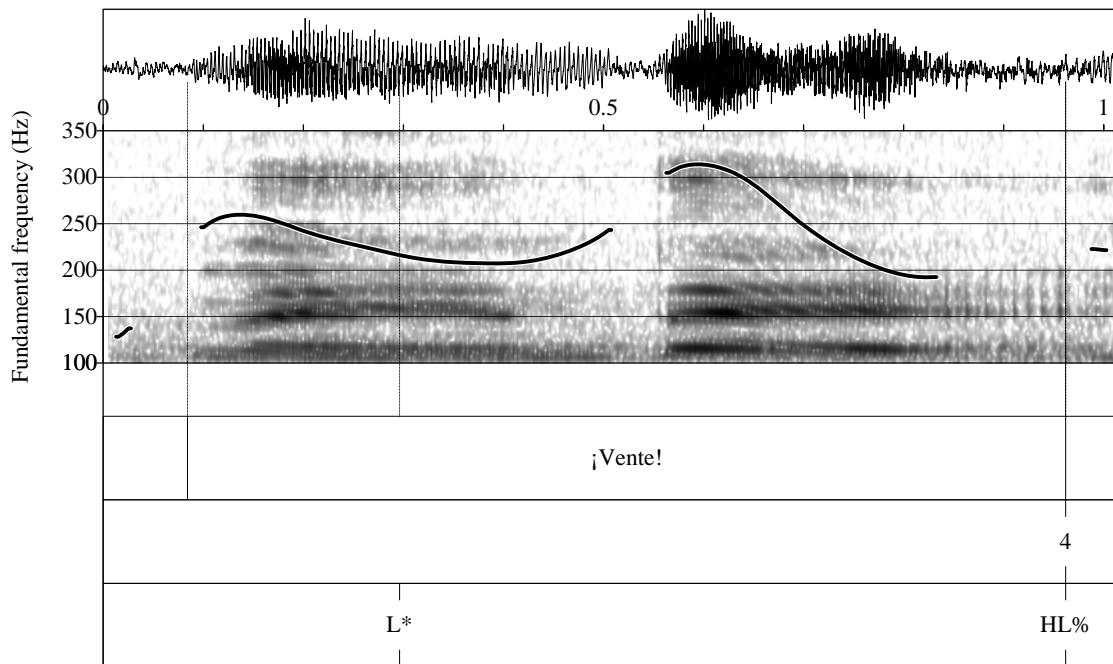


Figure 23: Waveform, spectrogram and F0 trace for the exhortative command ¡Vente! ‘Come!’ produced with the L* HL% nuclear pitch configuration.

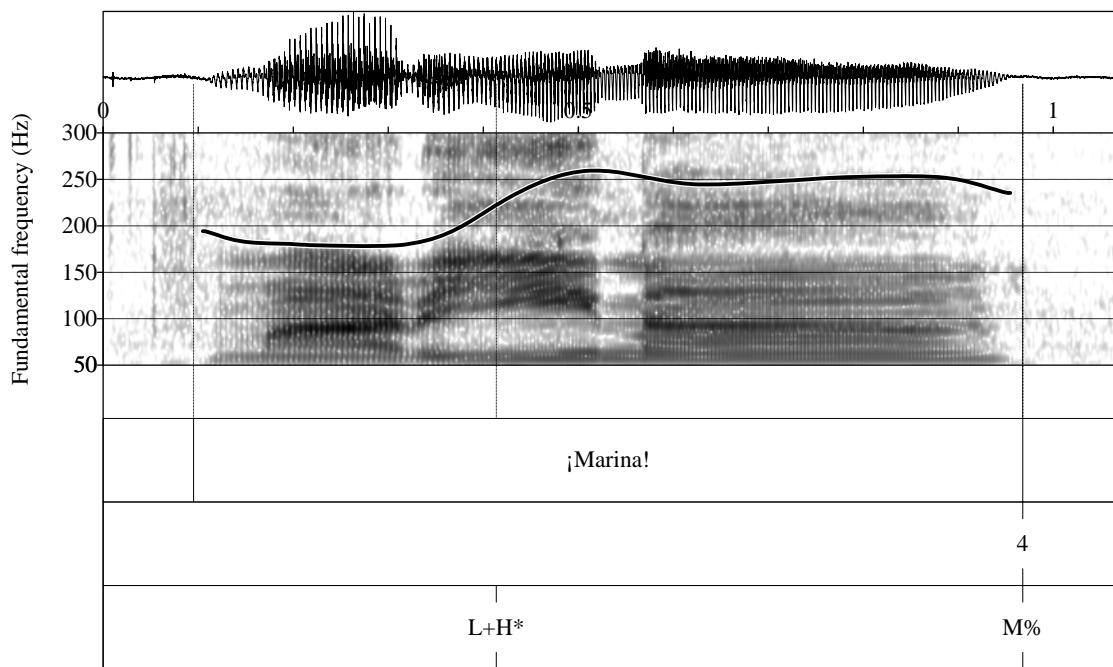


Figure 24: Waveform, spectrogram and F0 trace for the stylized call ¡Marina! produced with the L+H* M% nuclear configuration.

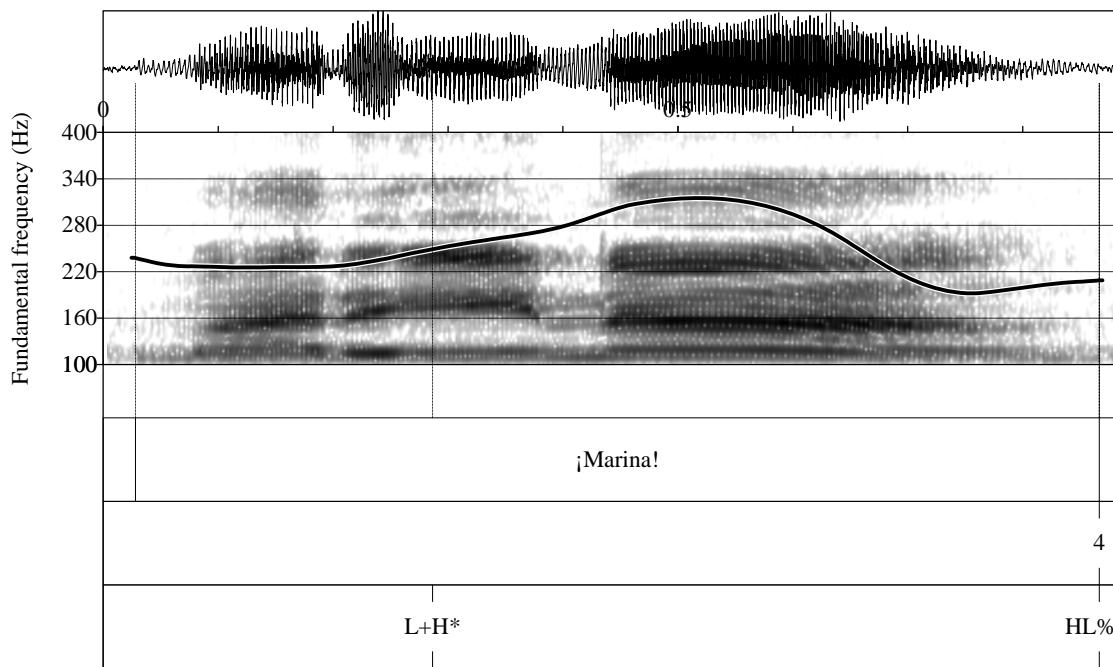


Figure 25: Waveform, spectrogram and F0 trace for the insistent call ¡Marina! produced with the L+H* HL% nuclear configuration.

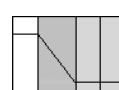
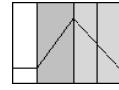
4. Conclusions

In this chapter I have laid out the most common tunes used in a corpus of data from two questionnaires. Looking at a wide range of utterance types allowed for the analysis of many different tune types, affording a more expanded depiction of Puerto Rican Spanish intonational phonology than has been available up until now. Intonational similarities between Canarian Spanish and Puerto Rican Spanish have previously been noted by Sosa (1999) and Quilis (1987, 1993). The analyses in this volume confirm shared features between these varieties, some of which are also shared with Dominican (Cibaeño) Spanish. For instance, all three dialects use final falls in declaratives, yes-no questions and wh- questions. They also show suspension of declination (downdrift) for broad focus questions produced with falls. Note that this suspension of declination does not occur in Argentinian Spanish (Gabriel et al. this volume), for example, a variety that also encodes yes-no questions with a low final boundary tone. A distinguishing characteristic of Puerto Rican Spanish accounted for here is the presence of a specific tune used only for confirmation questions when the speaker believes that the propositional content is true. This specific form-meaning pair was not found for Canarian or Dominican Spanish.

In prenuclear position, while Puerto Rican Spanish heavily favours L*+H, it is similar to Dominican Spanish in that for the same sentence type, prenuclear pitch accents may be focus-dependent (broad vs. narrow). Puerto Rican Spanish may distinguish between L*+H in prenuclear position for broad focus but L+<H* in the same position for narrow focus as previously shown by Willis (2003) for Dominican Spanish. The use of L+H* at the intermediate phrase boundary is very common in Puerto Rican Spanish and we might speculate that L+H* as an intermediate boundary marker might be used as an indexical cue for distinguishing Puerto Rican Spanish from varieties that are similar at the segmental and suprasegmental levels. Such intonational nuances between typologically related varieties provide a rich area to be explored in the way of both perception and production.

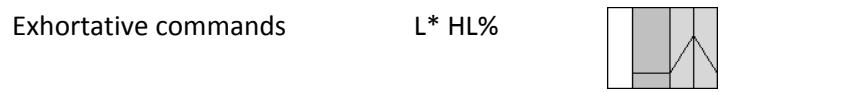
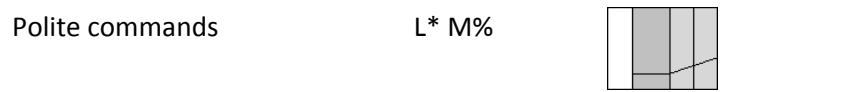
Table 3 summarizes the nuclear configurations common in Puerto Rican Spanish for each sentence type.

Table 3: Puerto Rican Spanish nuclear configurations by utterance type and their schematic representations

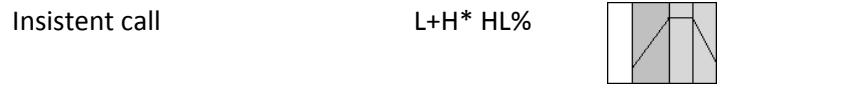
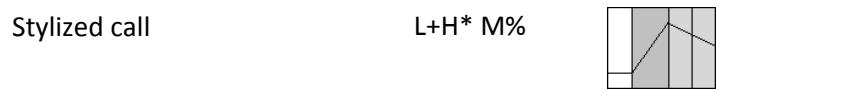
<i>Statements</i>		
Broad focus statements	H+L* L%	
<i>Biased statements</i>		
Narrow focus statements	H* L%	
	L+H* L%	

Exclamative statements	L* M%	
	L+H* L%	
Statements of the obvious	L+H* LM%	
<i>Questions</i>		
<i>Yes-no questions</i>		
Information-seeking yes-no questions	iH* L%	
<i>Biased yes-no questions</i>		
Polite yes-no questions	iH* HH%	
Echo yes-no questions	L+iH* L%	
Counterexpectational echo yes-no questions	L* HL%	
Confirmation questions	H+L* L%	
Tag questions	L* H%	
<i>Wh- questions</i>		
Information-seeking wh- questions	H+L* L%	
<i>Biased wh- questions</i>		
Echo wh- questions	L+iH* L%	
Reprise wh- questions	L* H%	
Rhetorical wh- questions (ironic)	L+H* LM%	

Imperatives: commands and requests



Vocatives



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