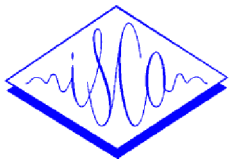

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Intonational Encoding of Pragmatic Meaning in Puerto Rican Spanish Interrogatives

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Abstract

Puerto Rican Spanish, a variety that prefers a final rise-fall rather than a fall-rise for yes-no questions has been claimed to have a default contour for information-seeking questions and a special configuration used only for biased negative questions. This study investigates the pragmatic division of labor for the nuclear configurations used for information-seeking questions, confirmation-seeking questions, biased negative questions and incredulity questions. Four contours are presented here: H* L%, (H+)L* HL%, H+L* L% and L+¡H* L%. None of these were favored significantly for the biased negation condition, disfavoring the idea that there is a special contour used for biased negative questions. H+L* L% was the most common contour (52%) for the information-seeking question condition, and was found to be the least preferred for biased contexts. However, H* L% was also commonly found for information-seeking questions (41%). A native speaker judged H* L% and L+¡H* L% as indicating interest and/or surprise while this did not seem to be the case for H+L* L%, indicating a possible relationship between tune choice and level of speaker affectedness in Puerto Rican Spanish. The rather consistent use of (H+)L* HL% for a specific type of surprise, incredulity, also supports this idea.

1. Introduction & Background

Drogheda English (like Dublin English) shows very few instances of rising intonation for information-seeking questions (ISQs) [1], while [2] shows a striking preference for a low-rise in American English for these types of questions. These differences have been described specifically in terms of variation in the nuclear configuration of the utterance, i.e. the nuclear pitch accent and the boundary tones that follow. Using a Map Task, [3] showed that Majorcan and Minorcan Catalan use the same pitch accent for information-seeking questions (questions where no mutual information with the interlocutor is assumed), but the boundary tones are different between the dialects. They also found that for tag and echo questions, new vs. given information, speaker attitude and degree of certainty also affected pitch accent and boundary tone choice. [4] showed that European Portuguese differentiates types of confirmation-seeking questions (those questions that assume the interlocutor shares some common ground) by choice of pitch accent, using L+H* for confirmation of understanding, but H*/L+H* for confirmation of perception, but did not find a difference for (ISQs) vs. confirmation-seeking questions (CSQs).

Similarly to Drogheda English, Puerto Rican Spanish (PRS) does not prefer high boundary tones for ISQs. These sorts of questions typically exhibit a fall to a low boundary. The F0 movement found just before the fall has been described in different ways in the literature. [5] reports on two nuclear configurations which differ in terms of a high tone in the tonic syllable. The first contour is described as having an additional rise in the nuclear tonic syllable, while the second does not show an additional rise, but rather a flat high tone. [5] notes that the default final contour for ISQs is the nuclear configuration with the additional rise in the tonic syllable, while the second is restricted to questions with negation where a specific answer is expected, i.e. biased negative questions. [6] and [7]'s examples correspond to both types of contours described by [5]. One key trait of the ISQ described in [6] is F0 movement initiated on the pre-tonic syllable where it reaches its peak and then descends from the peak to a low target. In a description of many contours in PRS, [8] shows evidence for three nuclear pitch movements possible for ISQs: a.) a high tone in the nuclear tonic syllable followed by a fall, b.) a rise to an upstepped high tone in the tonic nuclear syllable followed by a fall, and c.) a fall from a high leading tone throughout the nuclear tonic syllable. These three contour types are represented as H*L%, L+¡H* L% and H+L* L%, respectively in Sp_ToBI. [5], [6] and [7] do not mention a pitch accent that falls throughout the nuclear tonic syllable, but it is possible that the key trait I have mentioned above as described by [6] corresponds to the third nuclear configuration described by [8]. Since the F0 movement described in [6] is initiated in the pretonic syllable, the fall could conceivably occur throughout the tonic syllable. In any case, considering the reports of these three authors, there is evidence for at least three nuclear configurations associated with ISQs in PRS. Based on findings from studies like [3] and [4], it is reasonable to assume that information status or speaker attitude towards propositional content might influence tune choice. The aim of this study was to uncover the pragmatic restrictions, if any, for the three types of nuclear configurations I have described. I will report here on the results of a production study that was designed with the objective of exploring the types of contours used for questions in PRS produced in a variety of contexts, as shown in the following section.

2. Production Study

2.1. Methods

The data analyzed in this study of PRS come from two sources:

Map Task: a map task based on the HCRC method ([10])
Questionnaire: an intonation survey designed to elicit pragmatic contexts for different kinds of interrogatives in PRS: ISQs, CSQs, biased negative questions and counter-

expectation questions. The speakers read context prior to uttering each question target. There were five blocks for each condition, for a total of 20 targets per condition. The targets were syntactically identical or nearly syntactically identical (for the negation condition the negative particle *no* was included and for the CSQ condition the complementizer *que* 'that' was included) so that the speakers needed to differentiate the different contexts intonationally.

2.2. Participants

Participants were recruited through social networks and agreed to be recorded for the study. Five females aged 21-25 participated in the map tasks. 11 female and 4 male subjects participated in the questionnaire. Two of the participants from the questionnaire had also participated in the map task. The participants all lived in Río Piedras, but came from different parts of Puerto Rico. While it is of course possible to find variation in intonational contours for questions throughout Puerto Rico, the idea for this study was to identify nuclear configurations that were common to most speakers, in an effort to provide a more general account of the different nuclear configurations speakers of PRS use for different types of interrogatives. No participant reported any speech or hearing problems.

2.3. Data Analysis

A total of 290 utterances from the questionnaire (N=276) and the map task (N=14) were analyzed using Praat [11] and labeled using Sp_ToBI conventions, based on the first proposal of Sp_ToBI [12] as well as its revised version [13]. Once the most common nuclear configurations were identified, a native speaker of PRS was consulted for impressionistic feedback for each of the identified nuclear configurations. The speaker heard syntactically identical utterances that differed only in nuclear configuration, for each of the configurations that were found to be most frequent. For example, for the question *¿Marina vive en Aguada?* (Does Marina live in Aguada?), the speaker would hear the same utterance with each of the four most frequent nuclear configurations and was asked to state any pragmatic differences. The consultant listened to five sets of these utterances. Examples reported in this paper represent instances in which the meaning conveyed by the nuclear configuration was extremely clear to the native consultant. Often times, the pragmatic meanings described by the consultant were meanings that were not controlled for in the questionnaire, but were possible explanations for difference in contour based on descriptions of other languages/dialects of Spanish and were also found to be crucial for this data.

3. Results

3.1. Nuclear Configurations

A total of thirteen distinct nuclear configurations were identified in the data, but only the four most frequent (84% of the data) are reported here. In 3.2 I discuss their pragmatic uses based on how they were employed in the questionnaire and map tasks, as well as the consultant's impressions.

The most frequent contour in the data was H*L% and, as stated above, is realized as a high plateau during the tonic syllable of the last word followed by a low boundary tone as shown in Figure 1. As shown in Figure 1, the highest F0 value is reached within the nuclear pitch accent. The contour accounted for 26% (75/290) of the analyzed examples.

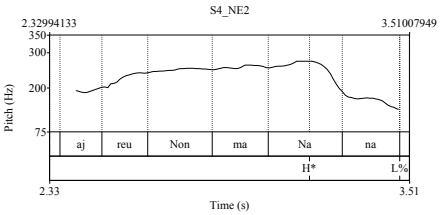

Figure 1. Pitch track of H* L% read speech example: *¿Hay reunión mañana?* (Is there a meeting tomorrow?) ISQ condition, S4 (female).

The second most frequent contour in the data is one that has not yet been described for PRS questions, (H+)L* HL%. The contour was most commonly found for the counter-expectation condition. It is phonetically realized as a low flat tone throughout the tonic syllable of the last word in the utterance, which may or may not be preceded by a leading H tone. A short rise followed by a final fall are found on the posttonic syllable(s). This nuclear configuration was found for 18% of the data (53/290). An example of (H+)L* HL% is shown in Figure 2.

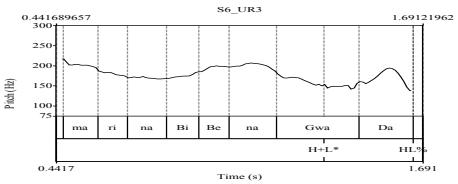

Figure 2. Example of H+L* HL% from read speech *¿Marina vive en Aguada?* (Marina lives in Aguada?) counter-expectation condition, S6 (female).

The third most frequent contour in the data was labeled H+L* L%. It is characterized as a fall throughout the tonic syllable from a leading high tone followed by a low boundary tone. The configuration accounted for 18% of the data (53/290). It is noteworthy that the configuration accounted for 71% of the Map Task examples (though this was a very small sample, N=14). Figure 3 shows a typical example of H+L* L%.

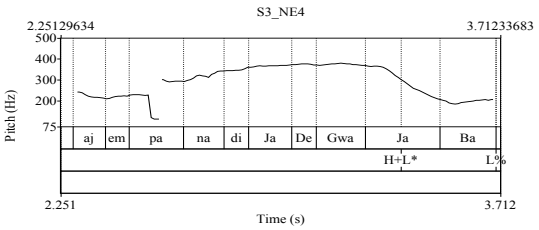

Figure 3. Example of H+L* L% from read speech *¿Hay empanadilla de guayaba?* (Are there guava turnovers?) ISQ condition, S3 (female).

The last nuclear configuration is an upstepped version of the configuration shown in Figure 1. In these cases, the pitch excursion for the pitch accent H* is produced at a higher frequency than the speaker's normal pitch range, and is also higher than any other high tones in the utterance. This results in a rise to the upstepped high tone within the nuclear tonic syllable, and is therefore labeled L+¡H*. This configuration occurred for 11% of the data (32/290). Figure 4 shows the pitch track of the L+¡H* L% nuclear configuration.

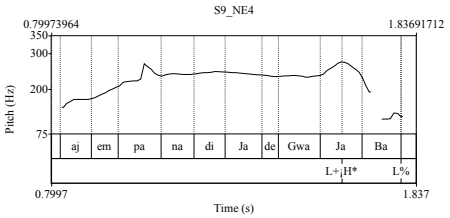

Figure 4. Example of L+¡H* L% from read speech, *¿Hay empanadilla de guayaba?* (Are there guava turnovers?) ISQ condition, S9 (male).

I will now discuss the distribution of these nuclear configurations in relation to the contexts elicited for the questionnaire and the Map Task.

3.2. Distribution of Nuclear Configurations

Table 1 shows the frequency of the four most common nuclear configurations by context type.

Table 1. Frequency of Nuclear Configurations by Context Type

	ISQ	Neg.	Counter-Expect.	CSQ	Total
H* L%	41% (31/76)	26% (20/76)	7% (5/76)	26% (20/76)	76
(H+)L* HL%	0% (0/65)	32% (21/65	54% (35/65)	14% (9/65)	65
H+L* L%	52% (27/52)	13% (7/52)	4% (2/52)	31% (16/52)	52
L+¡H* L%	19% (6/31)	32% (10/31)	6% (2/31)	43% (13/31)	31
					224

3.2.1. H L%*

The most frequently produced nuclear configuration was H* L%. This could possibly be the contour referred to as the default contour for ISQs by [5] since the highest point of the utterance is indeed reached within the nuclear pitch accent. If this were the case, this configuration would be considered the default for ISQs, but would not be found for biased negative questions. The percentages in Table 1 show the largest portion of occurrences of this configuration were indeed for the ISQ condition, where no specific answer would be expected. However, 26% of occurrences of H* L% were found for biased negative questions, and 26% for the confirmation context. Both negative questions and CSQs are biased towards a specific answer, i.e. the speaker has a reason to believe a proposition p or ⌜p. Additionally, H* L% occurs in the counter-expectation context. This context is biased in the sense that the speaker shows surprise or doubt (incredulity) about the propositional content of the question. 52% of the occurrences of H* L% appeared in contexts that were biased towards a certain answer, and half of these were comprised of the stimuli for the negation condition, suggesting that H*L% is not restricted to true ISQs only, which would be the prediction according to [5]. That is to say H* L% *can* occur when a specific response is expected, and also occurs with negation. Additional evidence that H* L% is the default contour for ISQs is that the percentage of H+L* L% for the ISQ condition was more that for H* L%. This is discussed in 3.2.3.

3.2.2. (H+)L HL%*

The next most common contour found in the data is (H+)L* HL%. This contour was favored in more than half of the utterances for the counter-expectation context. When presented with this contour, the native speaker consultant described it as both incredulous and doubtful. Therefore, the (H+)L* HL% contour is used, as [14] put it, "to challenge the other to defend, explain, or clarify her standpoint… allows the interlocutor to reformulate, clarify or rethink." For example, when listening to the utterance *¿Hay empanadillas de guayaba?* (There are guava turnovers?) with (H+)L* HL% versus L+¡H* L%, the consultant stated that using (H+)L* HL% would be rude to use to the turnover vendor (as if the presence of guava turnovers meant he had done something wrong). The consultant noted that L+¡H* L% would be a more polite way to express the unexpectedness of there being guava turnovers, i.e. surprise instead of incredulity. The use of (H+)L* HL% for incredulity in PRS, then, is clear. The non-appearance of the configuration for the ISQ context can be easily explained, since the context is unbiased, making (H+)L* HL% infelicitous. It would be odd for the speaker to doubt propositional content if she has no expected answer. The contour appears in other biased contexts, though less frequently. However, the speakers' productions depended on how they assessed the propositional content in the context. For example, we find (H+)L* HL% for a context in which the speaker finds out that there won't be a meeting the next day. Some speakers used this incredulity contour for the question *¿No hay reunión mañana?* (There's no meeting tomorrow?). It would make sense to use this contour if, for example the speaker was going to make an important presentation in the meeting but then finds out that there is actually no meeting. (H+)L* HL% is also found for 14% of the CSQ questions, in which case the speakers expressed incredulity about the propositional content they were confirming.

3.2.3. H+L L%*

H+L* L% was used for 26% of the data. While H* L% is more frequent overall for read speech, H+L* L% was the preferred tune choice for the Map Task (albeit a very small data set, N=14). This contour was found in [8] and possibly described in [6], but it is hard to say for sure since the alignment of the fall is not discussed. However, some examples in [6] and [7] seem to be comparable with this configuration. The most frequent use of H+L* L% was for the ISQ condition, which we have said shows no expectation about the polarity of the answer. Further, very few occurrences of H+L* L% (7/52) were found for the negation condition. H* L% appears twice as frequently for the negation condition. Therefore, there appears to be no distinction between these two final falls based on the presence of negation.

Both H* L% and H+L* L% occur in ISQ and CSQ contexts. A chi-square test revealed that there was no significant difference in the frequency of H* L% vs. H+L* L% for the ISQ condition (χ^2*= 1.54, df=1, p=.214)* even though H+L* L% was preferred (52%) over H* L% (41%). The difference was even *less* significant when comparing the two contours for the CSQ condition (χ^2*= .303, df=1, p=.582).* Therefore, the the distribution of the two configurations cannot be predicted based on the ISQ vs. CSQ dichotomy.

A native speaker consultant was asked whether H* L% vs. H+L* L% reflected a difference in speaker interest/involvement. The consultant confirmed that when

comparing H* L% versus H+L* L% the speaker sounded more interested when using H* L%. This perhaps explains the lower occurrence of H+L* L% compared to H* L% in the overall dataset (speakers may have tried to convey interest throughout the reading task), but higher occurrence in the Map Task. Additionally, there may also be a difference in the kind of configurations produced by the speakers based on task type, since speakers were reading scripted dialogues in the reading task, while the utterances produced in the Map Task were unscripted and spontaneously produced by the speakers. Differences in production based on task have been documented by [15] for León Peninsular Spanish. In any case, it would be helpful to elicit more naturalistic speech in order to determine whether there is a default preference for ISQs in PRS.

3.2.4. L+¡H L%*

The final contour analyzed was the L+¡H* L% configuration. Of particular interest was how this contour might differ from H* L%. Both exhibit a rise within the nuclear pitch accent, but the rise is more marked for L+¡H*, reaching a high tone in the upper portion of the speaker's pitch range about midway through the tonic syllable. H* L% was found significantly more for the ISQ condition (χ^2*= 5.53, df=1, p=.0187)* indicating that this marked rise within the nuclear pitch accent is probably not the one that [5] took as part of the default ISQ contour. L+¡H* L% did have higher percentages of frequency for the negation and CSQ contexts. [16] has noted that wider pitch excursion in the production of a given utterance conveys a speaker's concern about how her message will be inferred. Building on the difference in speaker interest described in 3.2.3 and relating this to [16], the idea of a gradient relationship between configurations was explored. The native speaker consultant consistently described a relationship such that H+L* L% did not seem to convey any affect, but H* L% sounded more interested or even surprised (depending on the context) and L+¡H* L% even more interested or surprised. Therefore, the impressionistic feedback suggests that the relationship between H* L% and L+¡H* L% is one of degree of speaker involvement, and dependent on the degree of affect the speaker intends to implicate. This is encoded by a wider pitch excursion produced in L+¡H* L%. As I have noted earlier the difference between L+¡H* L% and (H+)L* HL% is that the speaker can convey surprise without doubt in the former, while the latter conveys both.

4. Discussion

The most frequent contours in the data include H* L%, (H+)L* HL%, H+L* L% and L+¡H* L%. Three of these configurations are in line with the findings of other authors who have reported on ISQs in PRS. Regarding [5]'s findings for ISQs and negative questions, this pragmatic division of labor cannot be confirmed. It was not found that there was a contrast between a default ISQ contour and a special contour used for biased negative questions since all contours described here were produced at some point for biased negative questions. While H+L* L% was favored for the ISQ condition, it is not significantly favored over H* L%. Therefore, the data do not allow us to conclude that either one is the "default" contour for ISQs in this variety. However, native speaker intuitions revealed that degree of speaker involvement may also influence tune choice for ISQs in this variety. It is worth noting that the least favored contour for biased contexts was H+L* L%. The fact that H+L* L% was the least preferred in biased contexts and the most common for ISQs does suggest the possibility that it encodes neutrality with respect to the propositional content of the utterance. Given the native speaker intuition that H* L% and L+¡H* L% can be used to convey increased interest or surprise, I speculate that the difference between H+L* L% and H* L% is possibly due to the level of speaker involvement in the utterance, with more affected productions favoring H* L% and in even more extreme cases, L+¡H* L%. These affect-driven differences must be verified by perception studies. The findings presented here provide a more detailed description of interrogatives in PRS and their meaning, offering a unique approach to describing the pragmatic restrictions on the nuclear configurations available.

5. Acknowledgements

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