

# Intonational Contours of Nicaraguan *Granadino* Spanish in Absolute Questions and Their Relationship with Pragmatic Meaning

Whitney Chappell  
The University of Texas at San Antonio

## 1. Introduction

The present study focuses on the dialect of Spanish spoken in Granada, Nicaragua, a city of approximately 107,000 roughly 40 kilometers southeast of the capital in western Nicaragua. Founded by the Spanish in 1524, Granada is one of the oldest cities in the New World and served as an important trading post due to its location on the *Lago de Nicaragua* (Vidgen and Skolnick 2009). According to Lipski (1994), colonization was accompanied by a rapid decline in the indigenous population, decreasing by 90% within the first century of contact<sup>1</sup>, and while some African slaves were brought to Pacific Nicaragua, the population was never significant. All indigenous languages in Western Nicaragua are extinct, and extra-Hispanic influences on the dialect are limited to lexical items and place names (287-299). Potential contact situations are important in intonational studies: Hualde (2002) finds that two different intonational systems can become more similar when in contact, but based on the linguistic situation in Pacific Nicaragua, the influence of other languages on *Granadino* intonation is highly limited.

The study of intonation has burgeoned within the past few decades as notational systems have emerged and developed. The creation of Sp\_ToBI, a Spanish intonation notation system (Beckman et al. 2002) based on the Autosegmental Metrical (AM) Theory of Pierrehumbert (1980, see Ladd 1996 for a detailed review) has facilitated the ongoing scholarly discussion on variation across dialects of Spanish. Researchers have been drawing attention to the intonational divergence across dialects for nearly a century (see Navarro Tomás 1939, 1944, 1977; Alcoba and Murillo 1998; Quilis 1985; Sosa 1999; Prieto and Roseano 2010, among others), and Sp\_ToBI is meant to serve as a pan-Hispanic labeling system, regularizing the system used by Hispanic linguists. Nicaraguan intonation is of particular interest to the linguistic community because the region is highly understudied: the existing studies only perfunctorily describe the dialect based on impressionistic data (see Lipski 1994), and to my knowledge, no previous studies exist on Nicaraguan Spanish intonation. In order to lay the foundation for future linguistic studies, preliminary investigations are needed to identify the intonational contours at work in Nicaraguan Spanish and their pragmatic purposes.

The way in which speakers of different dialects manipulate intonational contours to encode pragmatic meaning varies, and the present study seeks to contribute to the discussion of intonational variation in Spanish by determining how *Granadino* speakers of Nicaraguan Spanish utilize nuclear configurations<sup>2</sup> to convey pragmatically distinct information. In addition to dialect, it has been widely argued that sentence type also affects intonational contours (see Ladd 1981, Büring and Gunlogson 2000, Rao 2006, Armstrong 2009, 2010a, 2010b, among others), and this study establishes a similar relationship between speakers' intonation and their biases and beliefs based on the provided context

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\* I would like to thank Meghan Armstrong for inspiring me to study Nicaraguan intonation and guiding me throughout this project; Cynthia Clopper, Judith Tonhauser, and the members of their Prosody and Meaning seminar for their endlessly helpful comments on earlier presentations and drafts; the audience members at HLS 2011 for their excellent suggestions; and two anonymous reviewers who greatly strengthened this paper. Any remaining mistakes are mine alone.

<sup>1</sup> The indigenous population rose somewhat through the mid-1800s, when the population again decreased (Lipski 1994: 287-288).

<sup>2</sup> Nuclear configurations are comprised of the intonation from the nuclear pitch accent through the boundary tone. See section 2.1 for more details.

and sentence type. With the ultimate goals of describing Nicaraguan intonation, situating Nicaraguan intonation within the Spanish-speaking world, and exploring the link between intonation and pragmatic meaning in the dialect, I analyze intonation across seven sentence types: declaratives, unbiased yes-no questions, inner negation questions, outer negation questions, incredulous questions, surprise questions, and tag questions. Nicaraguan interrogatives serve as the primary focus of the present study due to the higher level of cross-dialectal variation in interrogatives than declaratives (Sosa 1999, Prieto and Roseano 2010), although declarative intonation does serve as a point of departure and comparison.

This study finds two main nuclear configurations at play in *Granadino* Spanish: a L+H\* L% nuclear configuration associated with declarative and declarative-like sentence types (including tag questions and incredulous questions) used by a speaker to indicate her belief in and assertion of a particular proposition, and a H+L\* L% nuclear configuration associated with questions, used by a speaker to question or attempt to confirm a proposition. I hypothesize that a speaker's strong belief in a proposition is sufficient to switch the nuclear configuration from the question configuration (H+L\* L%) to the declarative configuration (L+H\* L%): the stronger the speaker's belief about a particular proposition, the more likely she is to use the declarative nuclear configuration.

This study also finds a relationship among continuous variables and the different sentence types, although there is a great deal of overlap. High F0 excursions are noted in surprise questions and inner negation questions, while a compressed pitch range seems to be associated with incredulous questions. Prenuclear alignment may be another indicator of sentence type: inner negation questions show an initial L\*+H and reach their peak F0 within the first 2-3 syllables of the utterance, while outer negation questions have a proclivity towards L+>H\*, with the pitch rise aligning with the first stressed syllable. Syllable duration appears to play a role as well: compared with other sentence types, the nuclear syllable of incredulous questions is longer in duration.

In order to categorize the patterning of nuclear configurations based on meaning, I group the sentence types by semantic definition<sup>3</sup> and prosodic realization, finding similarities among the following three categories: 1. declaratives, tag questions and incredulous questions, 2. unbiased yes-no questions, inner negation and outer negation questions and 3. surprise questions and incredulous questions<sup>4</sup>. I conclude that sentence types with similar semantic characterizations behave similarly prosodically, showing a distinct correlation between intonation and meaning in the production of these seven sentence types in *Granadino* Spanish. However, the relationship between these particular nuclear configurations and meaning may not be limited to *Granadino* Spanish: I point to similarities between Nicaraguan and Caribbean intonation based on the most common nuclear configurations and a propensity for a final fall in absolute interrogatives, suggesting certain suprasegmental commonalities in addition to segmental similarities.

## 2. Literature Review

### 2.1. Major Framework

Great strides have been made within the past few decades on the description and analysis of intonation in Spanish. Of primary importance, the Autosegmental-Metrical Theory and the creation of a uniform transcriptional system (Sp\_ToBI) have simultaneously established a foundation for the field and greatly aided researchers involved with intonational studies. This section provides a brief introduction to the framework utilized in intonational studies and some of the seminal work that is relevant to the current study.

The formation of the Autosegmental-Metrical Theory (or AM theory) of Pierrehumbert (1980) has been vital in analyzing pitch contour variation in Spanish-speaking countries. As Face (2001) explains, the theory proposes two autonomous but intertwined phonological tiers, that of tones and that of syllables. While these two layers occur autonomously (hence the term autosegmental) they invariably associate with one another, the tone tier corresponding with the syllable tier. The theory is metrical in that the metrical strength of a syllable determines its alignment with a corresponding tone: a strong or accented syllable aligns with a tone while a less prominent syllable does not. It should be

<sup>3</sup> Here I use semantic definition to refer to a group of several sentence types arranged together based on similarities in speaker beliefs, biases, and assumptions.

<sup>4</sup> Incredulous questions appear to fall into two categories; see Section 4 for a more complete discussion.

noted that while pitch accents are thought to associate with metrically stressed syllables, they are not necessarily directly aligned with one another (Ladd 1996) and may exhibit displacement, occurring after the stressed syllable with which they are associated.

AM theory has been successful in describing a wide range of languages due to its simplicity: it uses only two tones, low (L) and high (H). (M tones have been proposed by Beckman et al. (2002), but they are not widely accepted.) The theory is therefore able to account for a range of pitch accents without overcomplicating or overpredicting the phonological importance of various pitch productions. Under AM theory, pitch accents represent the monotonal or bitonal peaks and valleys that take place in a melodic contour. The pitch accents may be simple, consisting of only one low or high tone, or they may be more complex, consisting of a significant rise or fall from low to high or high to low<sup>5</sup>. The pitch accents are then marked with an asterisk to indicate the positioning of the stressed syllable relative to the contour.<sup>6</sup>

A Spanish-specific Sp\_ToBI prosodic transcription system has been proposed based on Pierrehumbert (1980), the first emerging in 2002 (Beckman et al.) and two subsequent revisions appearing in Face and Prieto (2007) and Estebas-Vilaplana and Prieto (2009). The tenets of the revised framework are the same but with updated notational systems, including symbols such as  $\grave{\text{}}$  and  $\! \grave{\text{}}$ , which indicate an upstepped ( $\grave{\text{}}$ ) or downstepped ( $\! \grave{\text{}}$ ) peak produced higher or lower, respectively, in the speaker's pitch range, and  $\text{>}$ , which will be seen in the  $\text{L+>H}^*$  prenuclear pitch accent. This symbol indicates that the prenuclear F0 rise begins in the metrically stressed syllable, but the H peak aligns with the following syllable. With the unification of this transcriptional system, linguists are able to provide an accurate cross-dialectal comparison of Spanish intonation under one unified framework.

## 2.2. Universals and Tendencies in Spanish Intonation

In spite of the intonational variety apparent across dialects of Spanish, certain prosodic tendencies do appear to be cross-dialectal. For example, Quilis (1985) concludes that in the dialects of Mexico, Madrid, and Puerto Rico Spanish, there occurs a descending pattern in pronominal interrogatives, and he attributes this tonal trend to the previously established interrogative nature of the utterance. On the other hand, Quilis describes an ascending pattern in absolute (or yes-no) interrogatives such as *Estuvieron esperando?* (155: 'Were they waiting?') in these dialects.

Along the same lines, Sosa (1999) catalogs the trends and divergences of pitch accents in declaratives, absolute interrogatives, and pronominal questions in the urban dialects of Buenos Aires, Bogotá, Mexico City, San Juan, Caracas, La Habana, and Lima, finding some universal tendencies across all of these dialects. For example, regardless of the region and dialect, final declarative sentences in lab speech always descend, most consistently with a nuclear configuration of  $\text{L}^* \text{L}\%$ . Also possible in the declarative is a circumflex (or rising-falling) ending, caused by  $\text{H}^* \text{L}\%$  or  $\text{L+H}^* \text{L}\%$ , but the  $\text{L}\%$  boundary tone is consistent across dialects. Sosa also finds one significant universal of absolute interrogatives: an initial rise. When the contour of an absolute interrogative is transposed on top of the contour of a declarative, the initial rise in tone is unmistakable.<sup>7</sup>

In his work on Peninsular intonation, Face (2003) shows that peak displacement occurs in prenuclear position in declaratives, and Prieto et al.'s work on Mexican Spanish (1995) demonstrates that while longer vowel length increases displacement, upcoming prosodic boundaries block this displacement in Mexican Spanish. Most important to the present study is Face (2007), who finds that final F0 movement overrides all other perceptual cues for listeners distinguishing between declaratives

<sup>5</sup> In addition to monotonal and bitonal pitch accents, tritonal pitch accents have recently been proposed in certain dialects of Spanish (Prieto and Roseano 2010).

<sup>6</sup> While not the focus of the present paper, it should be noted that pitch accents are not always found on metrically stressed syllables. Due to various factors such as broad focus, the presentation of given information, or the utterance's low emotional level, deaccenting in spontaneous speech is common in Spanish (see Rao 2006).

<sup>7</sup> In another cross-dialectal study on Argentina, Chile, Colombia, Costa Rica, Mexico, Puerto Rico, Spain, and Venezuela Spanish, Díaz-Campos (2002) finds more variability among declaratives, with three different nuclear configurations:  $\text{L+H}^*$ ,  $\text{L}^*+\text{H}$ , and  $\text{H+L}^*$ . However, because Díaz-Campos had his participants read a full paragraph, the results are not directly comparable to studies that involve spontaneous speech or the reading of isolated phrases, as the increased use of a rising final tone likely indicates continuity in the reading task.

and absolute interrogatives. Because of the final F0 movement's importance, the present study focuses on nuclear configurations as the primary intonational means of encoding pragmatic information.

### 2.3. Dialectal Variation

Quilis (1985) explains that the same intonational patterns may encode very different pragmatic meanings across dialects of Spanish, and Sosa (1999) finds that unlike the relative uniformity found in the declaratives in his study, interrogatives demonstrate wide-ranging pitch accent variation across dialects. Face (2006) even highlights the variation for one sentence type within a single dialect, finding three different melodic contours associated with narrow focus interrogatives in Peninsular Spanish. In addition to different nuclear configurations, Face finds that a post-focal reduced pitch range or the insertion of a boundary tone after the focal element serve as other strategies to mark narrow focus, suggesting that information is encoded in numerous ways across dialects *and* within a single dialect.

The most recent studies using the Sp\_ToBI transcriptional system have confirmed these observations: Prieto and Roseano (2010) clearly illustrate the intonational diversity across dialects of Spanish in the same sentence types, shown in Table 1 below.

Confirmation yes-no Qs	Counterexpectational yes-no Qs	Echo yes-no Qs	Information-seeking yes-no Qs	Broad focus statements	
L* H%	L+H* HH%	L+ <sub>i</sub> H* L%	L* HH%	L* L%	Castilian Spanish
L+H* HL%	L+H* HL%	H* HL%	L* HH% or H* HL%	L* L%	Cantabrian Spanish
<sub>i</sub> H* L%	L* HH%	<sub>i</sub> H* L%	<sub>i</sub> H* L%	L* L%	Canarian Spanish
H+L* H% or H+L* L%	H+L* H% or H+L* L%	H+L* H% or H+L* L%	H+L* H% or H+L* L%	H+L* H% or L+H* H%	Dominican Spanish
H+L* L%	L* HL%	L+ <sub>i</sub> H* L%	<sub>i</sub> H* L%	H+L* L%	Puerto Rican Spanish
L+H* L-	H* L%	H+L* L% or H* L%	L+( <sub>i</sub> )H* L%	(! )H* L%	Venezuelan Andean Spanish
L* HH%	L* HL%	L* HL%	L* HH%	L* L%	Ecuadorian Andean Spanish
H+L* L%	L+H* LH%	L* HH%	L+H* HH%	L+!H* L% or !H+L*	Chilean Spanish
L* H%	L* LH%	L* LH%	L* LH%	L* L% or L+H* L%	Mexican Spanish

Table 1. The most common nuclear configurations that occur in particular sentence types across dialects of Spanish (see Prieto and Roseano 2010).

Table 1 illustrates this diversity of nuclear configurations based on sentence type across several Spanish dialects, and the sheer immensity of the table demonstrates that intonation is used to create and convey meaning in many different ways across these dialects. However, no previous studies have attempted to situate the understudied dialect of Nicaraguan Spanish within the Sp\_ToBI framework to allow for a cross-dialectal intonational comparison. The present study aims to fill this void, enabling a better understanding of the interface between intonation and meaning in Spanish.

#### 2.4. *The Effects of Sentence Type on Intonation*

Recent studies have also shown intonational differences based on utterance type<sup>8</sup>. Particularly of note for the present study is the fact that different types of polarity questions have also been shown to influence intonation. Ladd (1981) proposes a theoretical distinction between positive polarity questions (e.g. *Is she right-handed?*) and negative polarity questions (e.g. *Isn't she right-handed?*), dividing the negative polarity category into inner negation, in which the speaker infers and confirms the negation of a proposition, and outer negation questions, in which the speaker believes the truth of a proposition and confirms this assumption. Büring and Gunlogson (2000) offer morphosyntactic, semantic and pragmatic evidence that, contrary to what Hamblin's account of question meaning (1973) would predict, these three question types do differ in their meaning. Supporting this notion with intonational evidence from Puerto Rican Spanish, Armstrong (2010b) finds distinctions between outer negation questions and broad focus yes-no declaratives, on the one hand, showing a shallower H+L\* fall in the nuclear configuration of outer negation questions than the  $\downarrow$ H+L\* fall in broad focus yes-no questions. She also suggests an intonational distinction between outer and inner negation questions: The nuclear configuration in inner negation questions is L+ $\downarrow$ H\* L% in Puerto Rican Spanish, markedly different than outer negation or broad focus yes-no questions' nuclear configurations. Armstrong's finding that pragmatic, context-based information does influence the nuclear configurations produced by her speakers raises the question of whether these distinctions will be maintained in other dialects of Spanish, e.g. Nicaraguan Spanish.

Based on the previous research documenting dialectal differences in intonational contours and intonational differences based on sentence type and pragmatic information, the present study addresses the following research questions:

- What are the contours associated with absolute (yes-no) questions in *Granadino* Spanish and how are they different from declarative contours?
- Given the seven different sentence types in this study, how do pragmatic and semantic factors influence nuclear configuration production in *Granadino* Spanish?
- Do *Granadino* Spanish speakers use different nuclear configurations to distinguish between sentence types differing in speaker bias and degree of speaker belief, such as inner negation questions and outer negation questions, on the one hand (as Armstrong 2010b found in Puerto Rican Spanish), and surprise and incredulous questions, on the other?

In answering these research questions, this study aims to describe the intonational contours at play in Nicaraguan Spanish, situate Nicaraguan Spanish intonation in the Spanish-speaking world, and determine some of the pragmatic factors that influence nuclear configurations in this variety.

### 3. Methods

#### 3.1. *Participants*

This project is intended as an exploratory study of Nicaraguan Spanish intonation, analyzing variations in *Granadino* adults' nuclear configurations based on the pragmatic information provided by the researcher. Nine adults, ranging in age from 20-59, participated in the study; all participants were born and raised in Granada, and few had traveled outside of Nicaragua.<sup>9</sup> The subjects were all acquaintances of the researcher prior to the study, and their hour-long participation was voluntary and unpaid.

<sup>8</sup> It should be noted that speech style (Face 2003) and task type (Henrikson 2009) have also been shown to affect intonational contours and are often interwoven with sentence type, which is the focus of this paper.

<sup>9</sup> Those who had traveled outside of Nicaragua were out of the country for a negligible amount of time, ranging from a few days to a few weeks, and it is very unlikely that any non-*Granadino* intonation would have influenced their nuclear configurations in any way.

### 3.2. Stimulus Materials

Before recording the subjects, the researcher obtained written consent and explained the general procedure of the study. A brief training exercise was also used to familiarize participants with the experimental design, in which they practiced reading a context, producing a bolded target utterance out loud and reflecting on the appropriateness of their intonation.

The experimental design in this study is based on the Discourse Completion Tests (DCT, cf. e.g. Nurani 2009) by Prieto (2001) and Armstrong (2010a). In this project, four larger storylines were used to allow for comparison of the intonation produced across different sentences. Should the same intonation occur across syntactic strings within one sentence type, it seems reasonable to assume that the recurring intonation is generalizable to the sentence type and not due to some other unforeseen factor. Within each storyline, seven utterance types (one declarative and six absolute interrogatives) altering speaker's belief in a proposition (p) were used as stimuli:

#### 1. Declaratives

Definition: Speaker believes and asserts the proposition (p) expressed by the utterance.

BEL (sp, p) & ASS (sp, p)

Example: *Tu amigo te está visitando y Uds. están pensando en qué van a comer esta noche. Tu amigo te dice que quiere ir a un restaurante pero no quiere carne.*

*Tu amigo: Quiero comer algo esta noche pero no quiero carne.*

*Vos: Está bien. **Por aquí hay un restaurante vegetariano.***

'Your friend is visiting you and you're both thinking about what you want to eat for dinner. Your friend tells you that he wants to go out to a restaurant, but he doesn't want to eat meat.

Your friend: I want to eat something tonight, just not meat.

You: Okay. **There's a vegetarian restaurant around here.'**

Given the preceding example, p = There's a vegetarian restaurant around here and ~p = There's not a vegetarian restaurant around here.

#### 2. Unbiased Yes-No Questions

Definition: Speaker questions p without any bias in expectation of p or ~p.

QUES (sp, p), ?p = {p, ~p}

Example: *Perdistes tu agenda y tenés que ir a la oficina de un compañero de trabajo para preguntar acerca del horario.*

*Vos: Perdí mi agenda y no sé nuestro horario. **¿Hay reunión mañana?***

'You lost your agenda and you have to go to a coworker's office to ask about the schedule.

You: I lost my agenda and I don't know our schedule. **Is there a meeting tomorrow?'**

Here, p = There is a meeting tomorrow, and ~p = There is not a meeting tomorrow.

### 3. Inner Negation Questions

Definition: Speaker infers  $\sim p$  from the linguistic context (from a conversational implicature) and wants to confirm  $\sim p$ .

INF (sp,  $\sim p$ ) & CONF (sp,  $\sim p$ )

Example: *Vas a Managua con un amigo y le decís que Uds. pueden quedarse con su amiga Mariana mientras están allí.*

*Vos: Nos podemos quedar con Mariana en Managua.*

*Tu amigo: No podemos quedarnos con ella—Se acaba de mudar.*

*Vos: ¿Mariana no vive en Managua?*

‘You’re going to Managua with a friend and you tell him that while you’re there you both can stay with your mutual friend Mariana.

You: We can stay at Mariana’s house in Managua.

Your friend: We can’t stay with her—She just moved away.

You: **Mariana doesn’t live in Managua?**

In this case,  $p$  = Mariana lives in Managua, and  $\sim p$  = Mariana doesn’t live in Managua.

### 4. Outer Negation Questions

Definition: Speaker believes  $p$  based on knowledge outside the given context and wants to confirm this belief by questioning  $p$ .

BEL (sp,  $p$ ) & QUES (sp,  $p$ )

Example: *Vas a un concierto en Managua y querés llamar a una amiga de tu hermano. Pensás que vive en Managua pero querés averiguar con tu hermano antes de llamarla.*

*Tu hermano: ¿Con quién vas a salir en Managua?*

*Vos: ¿No vive Mariana en Managua?*

‘You’re going to a concert in Managua and you want to spent time with your brother’s friend while you’re there. You think she lives in Managua, but you want to check with your brother before you call her.

Your brother: Who are you going to go out with in Managua?

You: **Doesn’t Mariana live in Managua?**

In this example,  $p$  = Mariana lives in Managua and  $\sim p$  = Mariana doesn’t live in Managua.

### 5. Surprise Questions

Definition: Speaker assumes  $\sim p$  based on the context but the other conversational participant asserts  $p$ , which the speaker then questions.

ASM (sp,  $\sim p$ )

PRES/ASS (x,  $p$ )

QUES (sp,  $p$ )

Example: *Tu secretaria te dice que hay una reunión mañana sin esperarlo. No sabías eso y estás sorprendido.*

*Tu secretaria: Tiene esa reunión con Bimbo mañana...*

*Vos: ¿Hay reunión mañana?*

‘Out of the blue, your secretary tells you that there’s a meeting tomorrow. You didn’t know that and you’re surprised.

Your secretary: You have that meeting with Bimbo bread tomorrow...

You: **There’s a meeting tomorrow?**’

In the surprise question example above,  $p$  = There is a meeting tomorrow, while  $\sim p$  = There is not a meeting tomorrow.

## 6. Incredulous Questions

Definition: Speaker believes  $\sim p$  based on specific world knowledge outside of linguistic context. The other conversational participant asserts  $p$ , which the speaker then questions.

BEL (sp,  $\sim p$ )  
 PRES/ASS (x,  $p$ )  
 QUES (sp,  $p$ )

Example: *Tu jefe te dijo que cancelaron la reunión que ibas a tener con Bimbo mañana, pero tu secretaria, al leerte tu horario, te dice que sí, hay reunión. No puede ser—ya has hablado con el jefe y te dijo que fue cancelado. Pensás que se equivoca.*

*Tu secretaria: Tiene esa reunión con Bimbo mañana...*

*Vos: ¿Hay reunión mañana?*

‘Your boss tells you that the meeting you were going to have with Bimbo bread tomorrow was cancelled, but your secretary, after looking at the calendar, tells you that you do have a meeting. It can’t be the case: you’ve already spoken with the boss and he said it was cancelled. You think she’s mistaken.

Your secretary: You have a meeting with Bimbo bread tomorrow...

You: **There’s a meeting tomorrow?**’

This example demonstrates how the author attempted to create a context that would explicitly violate the speaker’s beliefs, creating a stronger degree of disbelief than what would be anticipated in a surprise question in 5. Here,  $p$  = There is a meeting tomorrow and  $\sim p$  = There is not a meeting tomorrow.

## 7. Tag Questions

Definition: Speaker believes  $p$  based on knowledge outside of the linguistic context and confirms  $p$ .

BEL (sp,  $p$ ) & CONF (sp,  $p$ )

Example: *Tu amigo te invita a cenar y recordás que hay un restaurante vegetariano cerca que es buenísimo.*



*Tu amigo: ¿Adónde quieres ir?*

*Vos: **Por aquí hay un restaurante vegetariano, ¿no?***

‘Your friend invites you out to eat and you remember that there’s a vegetarian restaurant nearby that is amazing.

Your friend: Where do you want to go?

You: **There’s a vegetarian restaurant around here, isn’t there?**

In this example,  $p$  = There’s a vegetarian restaurant around here and  $\sim p$  = There’s not a vegetarian restaurant around here.

### 3.3. Procedure and data analysis

Participants were instructed to read a context<sup>10</sup> and then were asked to produce a target utterance, which, as illustrated above, was bolded to indicate that it was the target phrase. After the participants read the contexts provided and signaled their readiness, they were recorded using a unidirectional microphone and an H2 Handy Recorder. After each session the recorded data were transferred to a MacBook, and the utterances were saved as .wav files in Praat for later phonetic analysis.

The participants were either recorded in their homes or at *Casa Xalteva*, a local non-profit children’s organization that also serves as an international school. An attempt was made to maintain quiet recording environments, but the noisiness of the city paired with the traditional open-air architecture of Granada made this a challenge. In order to avoid the worst of the background noise, participants were asked to rerecord target utterances that overlapped with ambient noise. The participants were allowed to slightly modify the syntax of any sentence they found unnatural in order to produce the target intonation in a more fluid, personalized manner, although this modification was rare. Finally, participants were asked to reflect on the naturalness of the intonation they produced, and if they felt their output was unnatural given the context provided, they were encouraged to rerecord as many times as needed until they felt satisfied with their produced intonation. (This rerecording was minimal across all speakers and sentence types.) The researcher emphasized to the participants that they should produce the intonation they would naturally use with a fellow *Granadino*, an important point as many participants often interact with foreigners.

The participants’ reactions to their own intonation may also support the generalizability of the contours to a broader community; the participants appeared to be metalinguistically aware of which of their intonational contours sounded the most natural in a given context and asked to rerecord utterances that seemed stilted<sup>11</sup>; almost all of the participants showed the ability to recognize less natural productions in their speech. However, as no outside judges were used and speakers could potentially have been reacting to their own idiosyncratic intonation, more research is needed to substantiate the claim that individual speakers can compare the naturalness of their own contours with the prototypical contours of the broader community.

After collecting the data, the researcher proceeded to blindly<sup>12</sup> Sp\_ToBI transcribe 252 target utterances, the combined total of all participants’ responses across all storylines and question types. The notation is based on Beckman et al. (2002), using L (low) and H (high) monotonal and bitonal targets<sup>13</sup>, with a focus on nuclear configurations following Prieto and Roseano (2010). In addition to tones, downstep, upstep, displacement, and deaccenting were other sought-out features, transcribed by visual comparison with other contours of the same question type. One utterance from the tag question category was excluded from analysis because the participant produced a divergent sentence type, using *¿o no?* ‘or not’ instead of *¿no?*, resulting in a very different nuclear configuration, and one speaker

<sup>10</sup> The participants were told they may read the context silently or out loud depending on what seemed most comfortable or natural to them.

<sup>11</sup> After a production a participant deemed as unnatural, the participant would often say, for example, *No lo diría así* ‘I wouldn’t say it like that’ and ask to rerecord.

<sup>12</sup> That is, the researcher was unaware which numbered recording corresponded to which sentence type.

<sup>13</sup> I did not use mid-tones in my notation, but I did use updated notation from Estebas-Vilaplana and Prieto (2009).

was excluded entirely due her divergent intonational patterns<sup>14</sup>. In total, 223 utterances were included in the analysis and compared by sentence type, semantic definition, prosody, and continuous variables.

## 4. Results and Discussion

### 4.1. Declaratives

Declaratives, or utterances in which a speaker believes a proposition and asserts that proposition, were elicited to compare with the different types of questions produced in *Granadino* Spanish. Out of the 32 declaratives analyzed, variations of the nuclear configuration L+H\* L%<sup>15</sup> appear to be the most prototypical (or commonly produced) nuclear configuration, occurring in 72% (23/32) of the utterances. There were also six tokens of L\* L% (representing 19% of the total declarative nuclear configurations), two tokens of H+L\* L% (representing 6%), and one token of H\*+L (representing 3%), but these deviations from L+H\* L% will be treated as less encoded with the relevant pragmatic information as they occur significantly less than their L+H\* L% counterparts. Figure 1 shows the most common nuclear configuration and continuous variables<sup>16</sup> for declarative utterances.

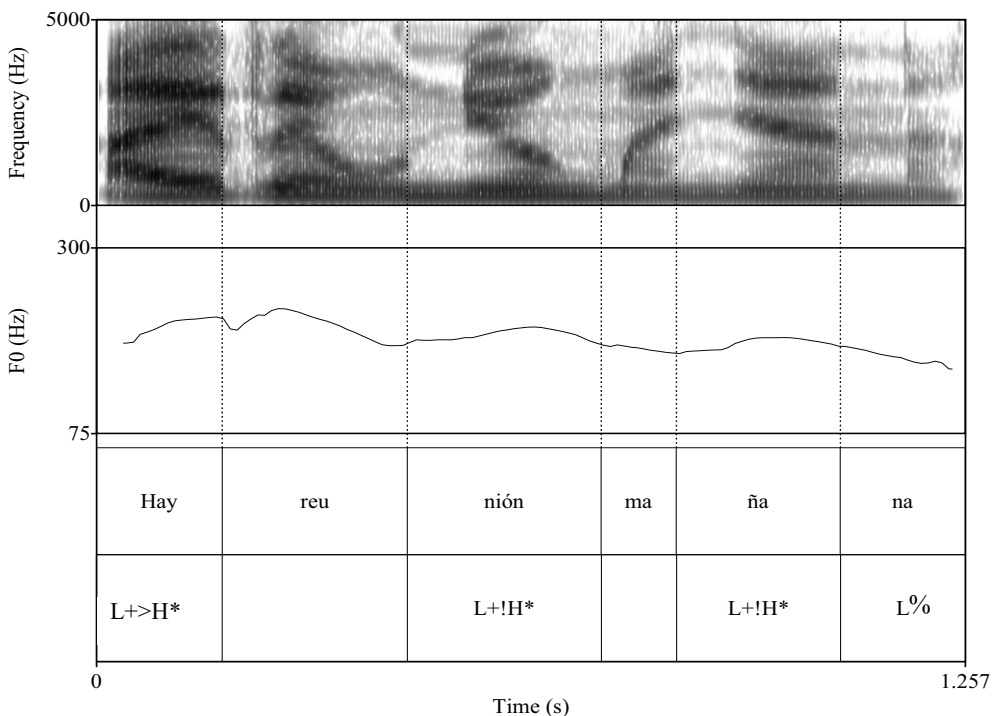


Figure 1. Spectrogram and F0 contour of a common declarative contour, specifically *Hay reunión mañana* ‘There’s a meeting tomorrow’, demonstrating displaced F0 alignment in prenuclear position *hay*, downstepping, and a L+!H\* L% nuclear configuration.<sup>17</sup>

<sup>14</sup> The excluded participant only produced one nuclear configuration in all of her utterances: L\* HH%, which varied markedly from the production of other *Granadino* participants. The researcher hypothesizes that because this participant is a children’s math teacher and host parent to foreign students, an exaggerated rise requesting confirmation of understanding may be used more frequently in her speech than in the speech of other participants.

<sup>15</sup> These ‘variations’ refer to the researcher’s condensing of upstepped or downstepped variants of the same nuclear configuration.

<sup>16</sup> By “continuous variable”, I refer to non-categorical measurements such as F0 excursion and syllable duration.

<sup>17</sup> In my analysis, monosyllabic words such as *hay* ‘there is’ may bear pitch accent (see the categories proposed in Quilis 1993). It should also be noted that the alignment of an oxytone, e.g. *reunión* ‘meeting’ in this example, is expected to be different than other stress patterns (Hualde 2002).

Two continuous variable features are of note in declaratives. First, in agreement with what Face (2003) found in Castilian Spanish, peak displacement occurs across these declaratives in prenuclear position, resulting in a F0 maximum after the prenuclear stressed syllables. Second, although not categorical, downstepping from an early fundamental frequency (F0) maximum is frequent, particularly visible in longer utterances. For example, phrases such as *Por aquí hay un restaurante vegetariano* ‘There’s a vegetarian restaurant around here’ are more likely to exhibit downstepping than *Le gusta el mango* ‘He likes mango’, for example.

#### 4.2. Unbiased Yes-No Questions

Unbiased yes-no questions tend to exhibit a H+L\* L% nuclear configuration. This particular configuration was found in 75% of the utterances (24/32), with L+H\* L% occurring with 16% frequency (5/32), L\* HH% in 6% of the utterances (2/32), and L\* L% in 3% (1/32).

Like declaratives, displaced peak alignment in prenuclear position is common in unbiased yes-no questions with the initial pitch accent varying between L+H\* and L+>H\*, but downstepping is not as common. Instead of an initial F0 peak followed by declining peaks, unbiased yes-no questions in *Granadino* Spanish tend to exhibit a hat-shaped intonation. This resistance to declination or ‘suspension of downdrift’ in yes-no questions is found in other dialects of Spanish, attested in both Castilian and Puerto Rican Spanish (Armstrong 2010b). Figure 2 shows a prototypical unbiased yes-no question with these features.

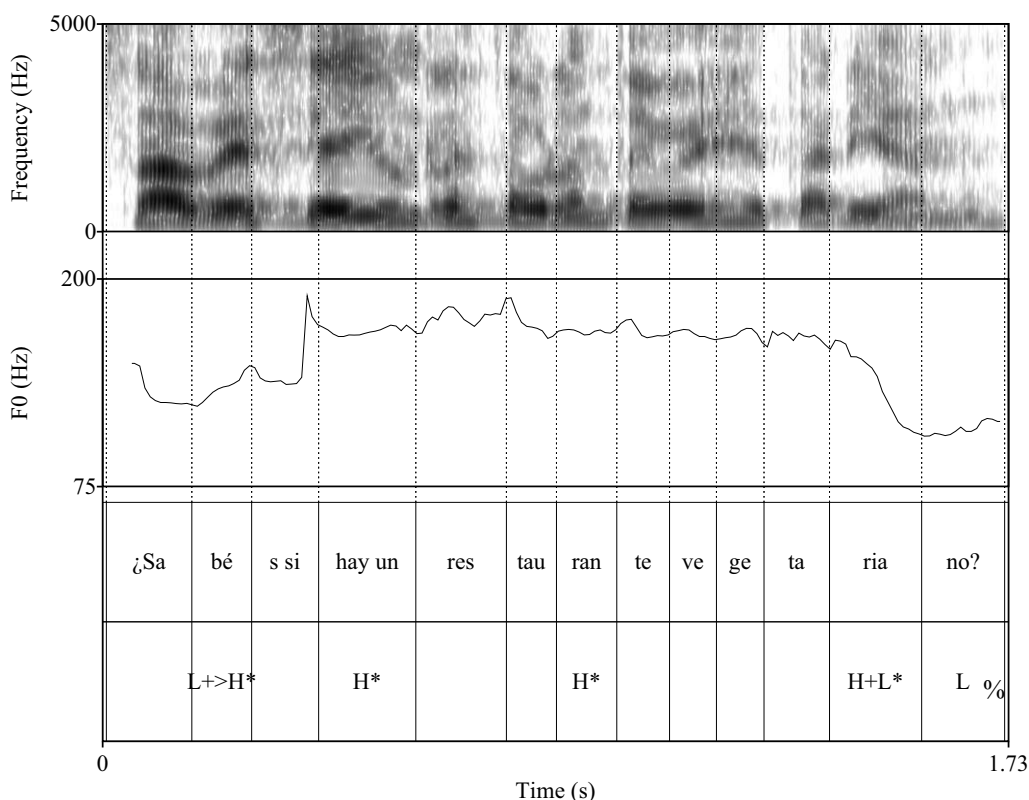


Figure 2. Spectrogram and F0 contour of a common unbiased yes-no question *¿Sabés si hay un restaurante vegetariano?* ‘Do you know if there’s a vegetarian restaurant?’, showing a delayed F0 peak in prenuclear position, a hat contour, and H+L\* L% nuclear configuration.

#### 4.3. Inner Negation Questions

Like unbiased yes-no questions, inner negation questions have H+L\* L% as their most common nuclear configuration. Out of the 32 inner negation questions, 84% (27/32) showed variants of this

nuclear configuration, demonstrating a higher degree of speaker agreement on the most prototypical nuclear configuration than in declarative or unbiased yes-no questions. Of the remaining five tokens, two tokens were L\* L% (6%), two were L+H\* L% (6%), and 1 (3%) was L\* HH%.

As seen in unbiased yes-no questions, inner negation yes-no questions tend to resist downstepping, resulting in a contour similar to unbiased yes-no questions' hat-shaped contour, although the F0 excursion is generally wider in inner negation questions. While peak displacement is common on the first stressed syllable in both question types, inner negation questions reach their peak F0 more quickly, most commonly using a L\*+H pitch accent in prenuclear position. As seen in Figure 3, the maximum F0 is reached on the second syllable after a low first syllable. In fact, the F0 jumps from a relatively level 112 Hz on the first syllable *Es* 'is' to 199 Hz of the second syllable *que* 'that'.

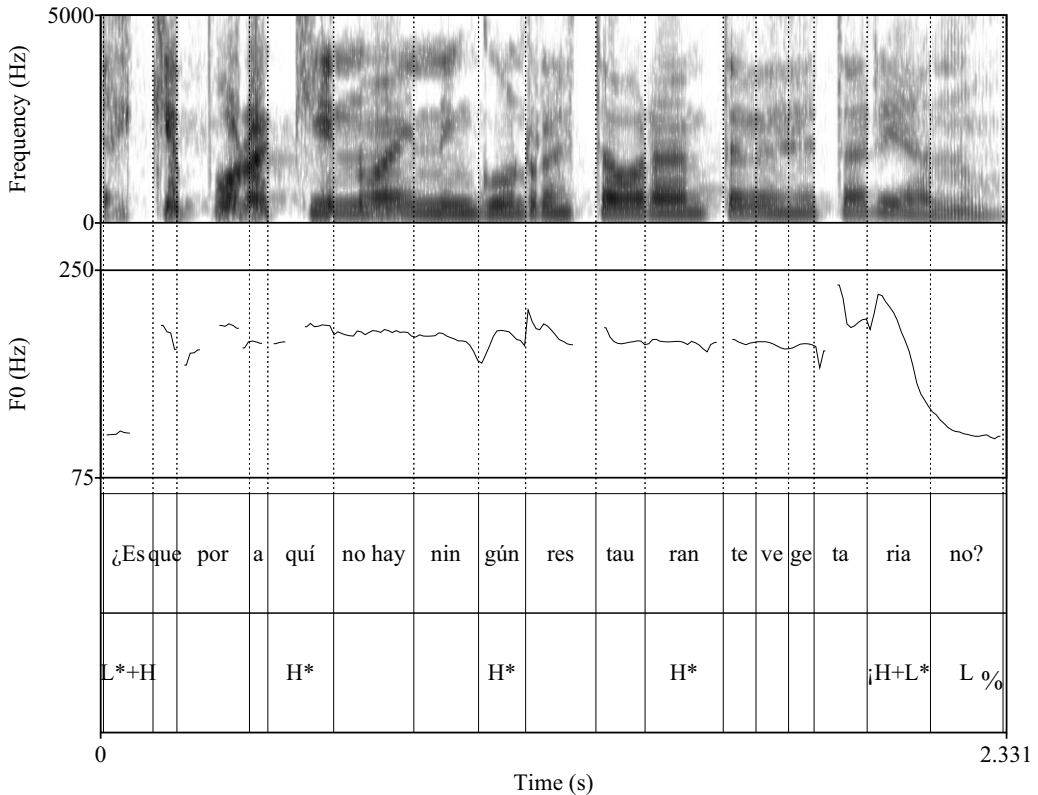


Figure 3. Spectrogram and F0 contour of an Inner Negation Question: *¿Es que por aquí no hay ningún restaurante vegetariano?* 'There isn't a vegetarian restaurant around here?'

Although a similar pattern of achieving the F0 peak early in the utterance occurs in other sentences, e.g. *¿No te gusta el mango?* 'You don't like mango?', in which the first syllable, *no*, is realized as the L\* and the second syllable, *te*, is realized as the +H, it is possible that the *es que* construction contributes to this initial L\*+H pitch accent generalization in inner negation questions, as most *es que* utterances show a F0 peak on the second syllable *que*. More research is needed to confirm the influence of these additional syntactic elements on prenuclear alignment.

#### 4.4. Outer Negation Questions

Outer negation questions only differ from inner negation questions in the belief of the speaker: in outer negation questions, the speaker is already biased to believe the proposition she is questioning based on extralinguistic knowledge, whereas the speaker has inferred that the proposition being questioned is not true in inner negation questions (as distinguished by Ladd 1981). Armstrong (2010b) found a distinction in nuclear pitch accent in Puerto Rican Spanish based on this difference, attributing L+<sub>i</sub>H\* to inner negation questions and H+L\* to outer negation questions. *Granadino* Spanish

speakers, on the other hand, did not make a distinction between nuclear pitch accents in inner and outer negation questions. In both cases, the participants produced H+L\* as the most common nuclear pitch accent followed by a low boundary tone. In fact, 84% of outer negation questions were produced with a H+L\* L% nuclear configuration (27/32), with marginal use of other nuclear configurations: 6% L+H\* L% (2/32), 3% L+H\* HH% (1/32), 3% L\* HH% (1/32), and 3% L\* L% (1/32).

Outer negation questions differ from inner negation questions with an initial rise instead of an initial low tone corresponds to the first stressed syllable, resulting in a L+>H\* utterance-initial pitch accent instead of the L\*+H most common in inner negation questions. Also of note, while downstepping is not as common as in declaratives, it appears to be used more in outer negation questions than inner negation questions. Figure 4 captures these distinctions.

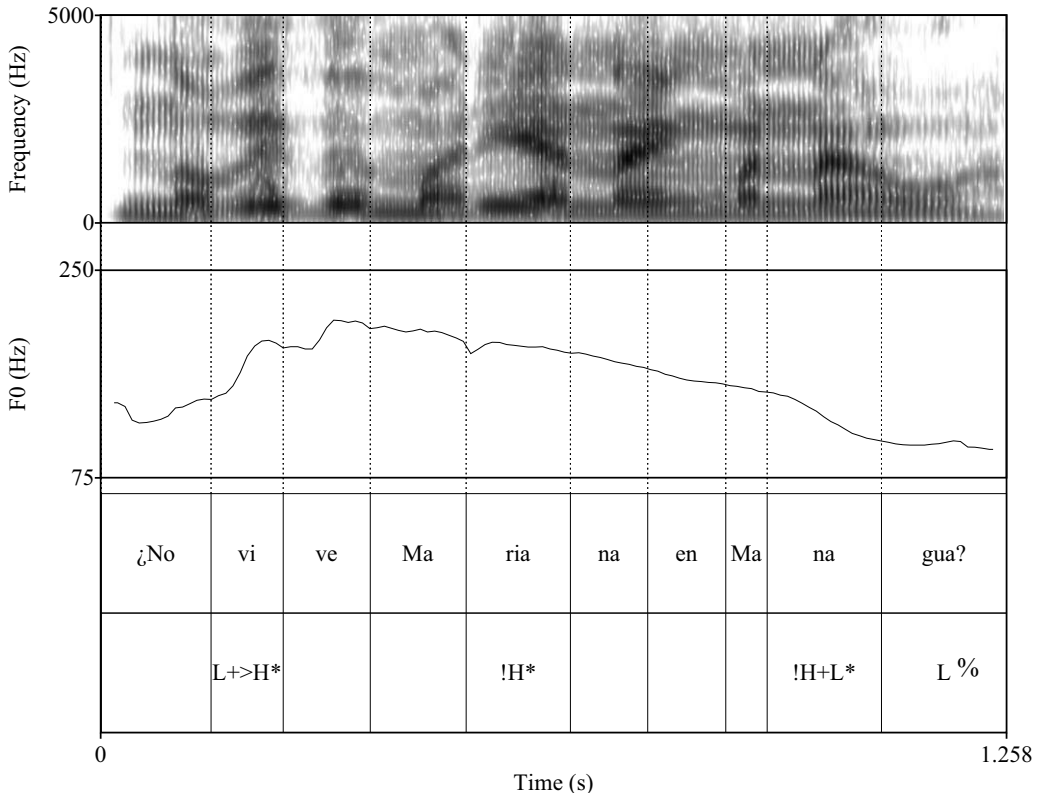


Figure 4. Spectrogram and F0 of a common outer negation question: *¿No vive Mariana en Managua?* ‘Doesn’t Mariana live in Managua?’ Shown here are the L+>H\* prenuclear pitch accent, downstepping throughout the utterance, and a !H+L\* L% nuclear configuration.

#### 4.5. Surprise Questions

The differences in the data between surprise questions and incredulous questions are unsurprisingly minimal, as the two question types form a ‘degrees of belief’ continuum: a weaker speaker belief in a proposition and stronger belief in the other conversational participant’s assertion of the contrary correspond to surprise questions while a stronger speaker belief in a proposition and a weaker belief in the other conversational participant’s assertion correspond to incredulous questions<sup>18</sup>.

<sup>18</sup> The researcher believes some of the intonational overlap may be because the semantic distinction between surprise and incredulous questions may not have been as clear in the stimuli as she had hoped. This complicated distinction was not aided by the fact that incredulous questions preceded surprise questions in the guided survey, potentially influencing participants to think that incredulous questions called for ‘surprised’ and the following surprise questions called for ‘even more surprised’. One participant even commented that the two question types were essentially the same thing, demonstrating the confusion between the two stimuli sets. A revised version of the guided survey may lead to less prosodic overlap.

Although the data sets overlap, two distinct intonations emerged, and pending my native speaker consultants' assessments of the data, I will attempt a preliminary analysis of their distinctions.

The most common nuclear configuration was H+L\* L%, representing 59% of the data (19/32), but unlike declaratives, unbiased yes-no, and inner and outer negation questions, a competing nuclear configuration appeared: L+H\* L% occurred in 34% of the data (11/34). There were also individual tokens of L+H\* HH% and L\* HH%, representing 3% of the data each.

At the moment the researcher has only been able to consult with one Nicaraguan, but after listening to several contours found both in incredulous and surprise productions, she associated the H+L\* L% nuclear configuration and greater pitch excursions with surprise. The importance of pitch excursions makes sense given past studies: Rao (2006) explains that utterances with heightened emotions, which could include surprise, do not undergo deaccenting, which is more likely in declaratives carrying known information. My Nicaraguan consultant also explained that the utterances she listened to with a L+H\* L% nuclear configuration actually sounded like statements, in spite of the fact that some of these utterances had a compressed F0 and some showed a greater pitch excursion, which supports Face's (2007) conclusion that final F0 movements are the most important perceptual cue used to distinguish between declaratives and absolute interrogatives. Based on these initial interpretations, it seems that the nuclear configuration plays the most crucial role in orienting listeners to the hearer's beliefs, but pitch excursion may help indicate surprise.

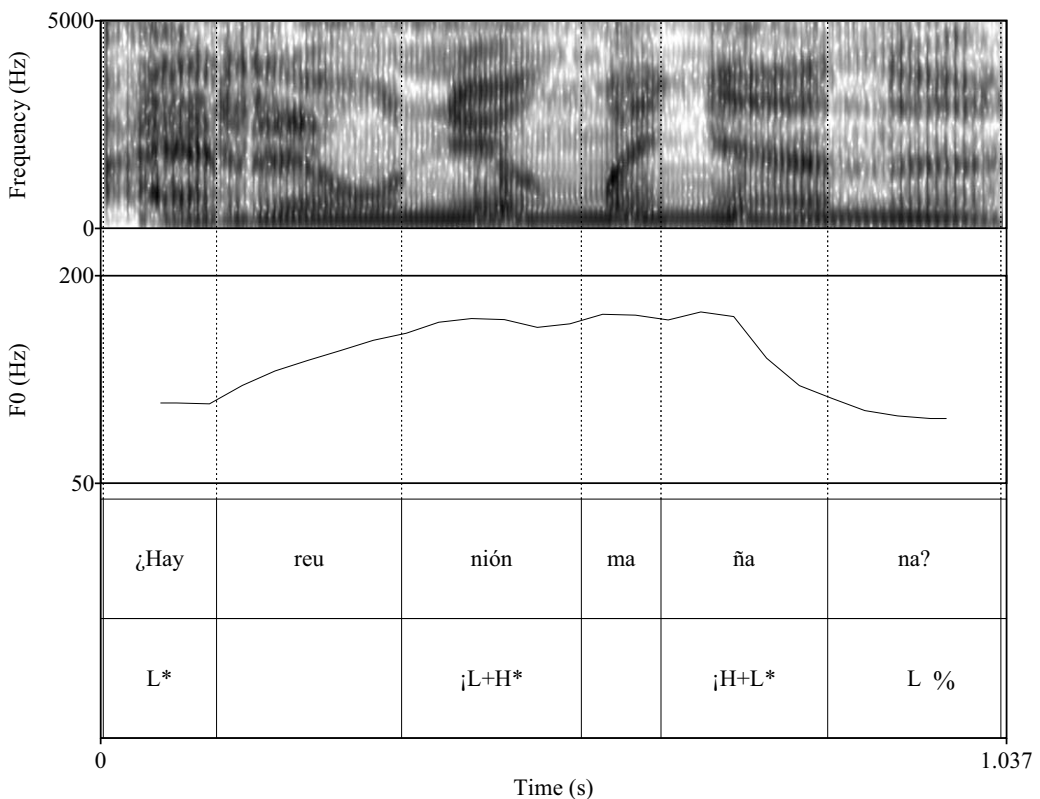


Figure 5. Spectrogram and F0 contour of a common surprise question, in this case *¿Hay reunión mañana?* ‘There’s a meeting tomorrow?’

Figure 5 illustrates a common surprise question with a H+L\* L% nuclear configuration and an expanded pitch range compared to incredulous questions (see 4.6). In addition to an expanded F0, another strategy that the participants may use to indicate surprise is narrow focus on one lexical item, as if to question that one word in particular. (For example, several participants put a L+¡H\* pitch accent on *vive* ‘lives’ in the question *¿Mariana vive en Managua?* ‘Mariana lives in Managua?’ as if to question that particular verb, i.e. “She *lives* in Managua? She doesn’t just *shop* there or *take classes* there?”) Although these data are scarce in incredulous questions, the same strategy may apply to that

question type as well. More analysis is needed before broader claims can be made about narrow focus in these questions, but it does appear to be an additional strategy for marking the speaker's surprise.

#### 4.6. Incredulous Questions

Incredulous questions, like surprise questions, show conflicting participant data. The most commonly produced nuclear configuration for incredulous questions is H+L\* L%, occurring in 56% (18/32) of the productions. A significant number of L+H\* L% nuclear configurations were also produced, accounting for 31% (10/32) of the data. Less competitive but still present were L\* L% (9%, 3/32) and L\* HH% (3%, 1/32) nuclear configurations.

In addition to a declarative-like nuclear configuration, this question is also categorized by an extremely compressed F0 and an elongated nuclear syllable, illustrated in Figure 6.

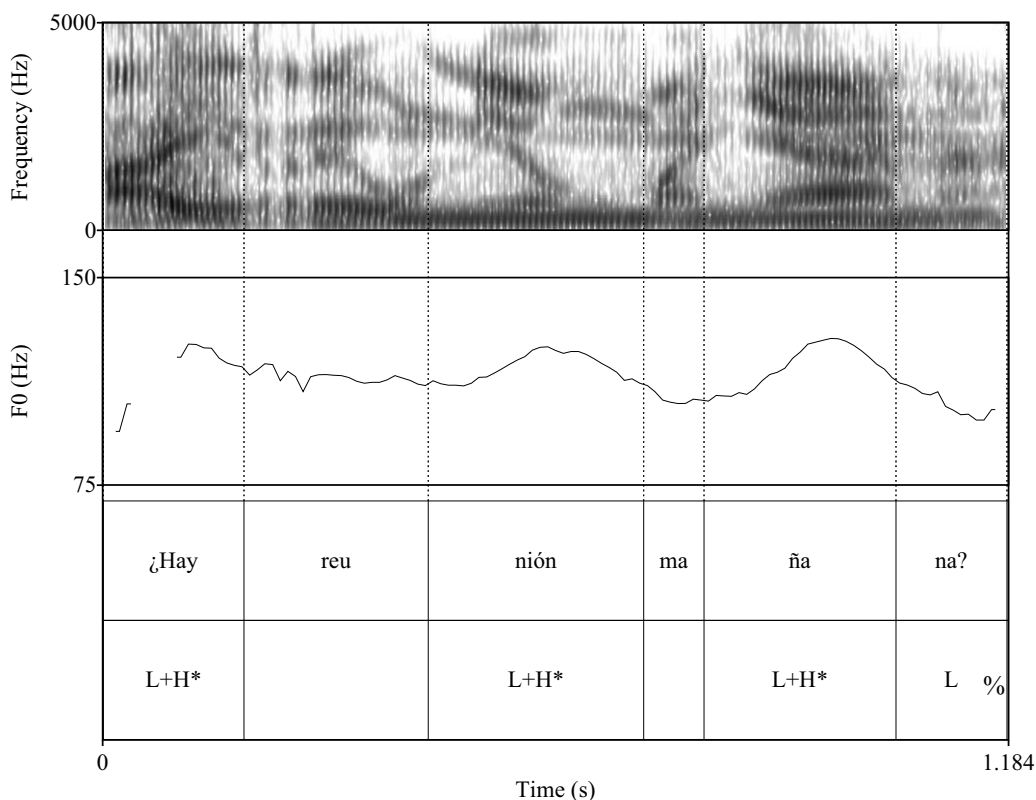


Figure 6. Spectrogram and F0 contour of a common incredulous question, *¿Hay reunión mañana?* ‘There’s a meeting tomorrow?’

While the H+L\* L% nuclear configuration is the most frequent in these results, I hypothesize that the L+H\* L% nuclear configuration is what signals an incredulous near rejection of the proposition under discussion. The fact that a native speaker of this dialect categorized incredulous questions with L+H\* L% nuclear configurations as declaratives suggests that this nuclear configuration contributes to a loss of question meaning; these incredulous utterances instead take on a sense of a mocking repetition. Based on the semantics of the nuclear configurations discussed in previous sections, this makes sense: H+L\* L% is the typical nuclear configuration across question types, while L+H\* L% is found in declaratives. The stronger a speaker's belief in a proposition, the less likely she is to honestly question the other conversational participant, and she will instead move towards a declarative ‘mock question’ with a declarative-like nuclear configuration.

#### 4.7. Tag Questions

Tag questions behave much like declaratives, which also makes sense semantically: in both sentence types the speaker believes and asserts a proposition. The only difference is that in tag questions the speaker aims to confirm the proposition instead of simply asserting it.

Like declaratives, the nuclear configuration of the proposition, i.e. the last stressed syllable before the appended *¿no?*, appears as L+H\* L% in 90% (28/31) of its productions. H+L\* L% also occurs, but infrequently, in only three tokens (10% of the data).

More variation occurs in the appended *¿no?*, from which several nuclear configurations emerge. The most common is another L+H\* L% (48%, 15/31) followed by H\* HH% (26%, 8/31), L\* HH% (23%, 7/31), and H\* L% (3%, 1/31). In line with commonly observed declarative patterns, downstepping tends to occur across longer utterances in tag questions as well, and prenuclear peak displacement is commonly observed. Figure 7 shows a typical tag question contour with these declarative-like properties.

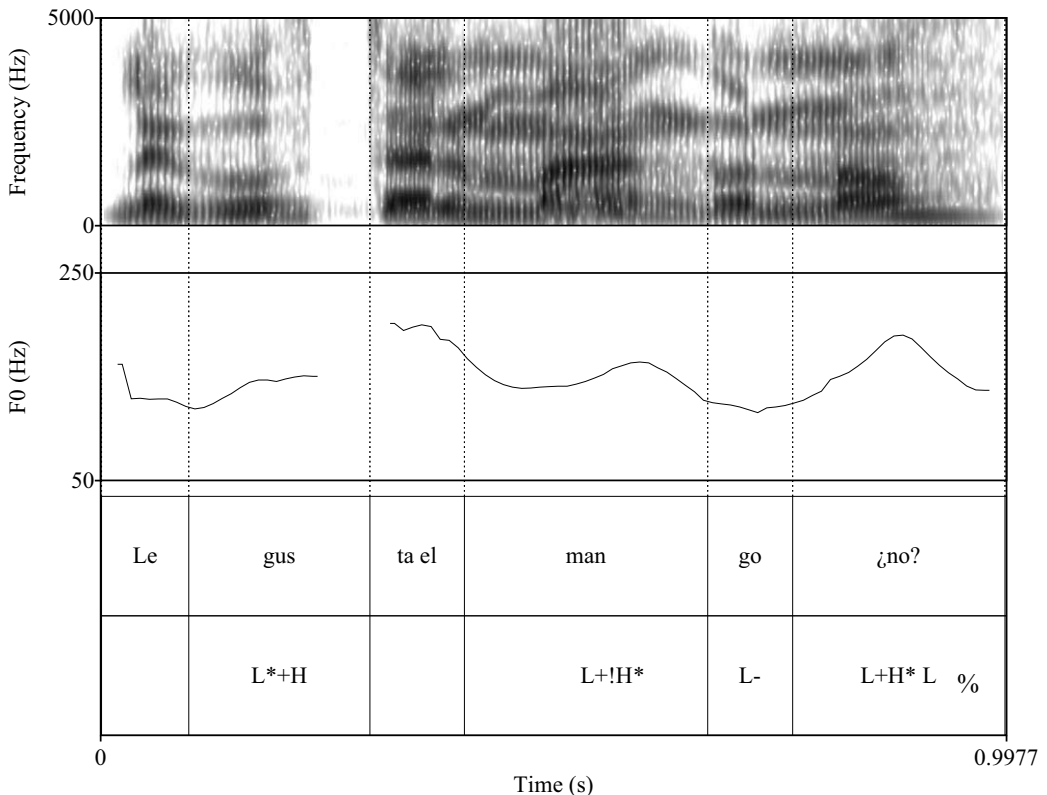


Figure 7. Spectrogram and F0 contour of a common tag question: *Le gusta el mango, ¿no?* ‘He likes mango, doesn’t he?’

The presence and frequency of the low boundary tone after the appended *¿no?* is notable in Nicaraguan Spanish, as most dialects of Spanish show a HH% in tag questions. Also of note in these melodic contours is the fact that every absolute question type analyzed shows a low boundary tone, which contradicts Quilis’s (1985) generalization that absolute questions have a final rise, illustrating the breadth of possible nuclear configurations used to convey meaning across dialects of Spanish.

#### 4.8. The Prosody-Meaning Interface

The analysis of the seven different sentence types above shows that two principle nuclear configurations have emerged from these data: H+L\* L%, which is associated with both unbiased and biased answer-seeking questions, and L+H\* L%, which is associated with declaratives and questions



with declarative-like semantic properties, such as tag questions and incredulous near rejections of a proposition.<sup>19</sup> These two nuclear configurations can serve to orient the hearer to both the general sentence type and stance of the speaker on the proposition.

Based on both semantic and prosodic resemblances, these sentence types can be grouped into categories, shown in Table 2 below.

	Sentence Type	Semantic Definition <sup>20</sup>	Nuclear Configurations	Continuous Variables
Question Intonation	<b>Subgroup 1: Unbiased YN, Inner Negation and Outer Negation Questions</b>			
	Unbiased YN Q	QUES (sp, p) ?p = {p, ~p}	H+L* L%	1. Delayed F0 peak in prenuclear position 2. Hat shaped contour
	Inner Neg Q	INF (sp, ~p) CONF (sp, ~p)	H+L* L%	1. Expanded F0 2. L*+H pitch peak reached early in utterance
	Outer Neg Q	BEL (sp, ~p) CONF (sp, ~p)	H+L* L%	1. Delayed L+>H* F0 peak in prenuclear position 2. Downstepping
	<b>Subgroup 2: Surprise and Incredulous Questions</b>			
Surprise Q	ASM (sp, ~p) ASS (x, p) QUES (sp, p)	H+L* L% (Also L+H* L%)	1. Expanded F0 2. Narrow focus as a surprise strategy	
Declarative Intonation	Incredulous Q	BEL (sp, ~p) ASS (x, p) REJ (sp, p)	H+L* L% (Also L+H* L%)	1. Compressed F0 2. Elongated nucl. syllable 3. Narrow focus as a surprise strategy
	<b>Subgroup 3: Declarative and Tag Questions</b>			
	Declarative	BEL (sp, p) ASS (sp, p)	L+H* L%	1. Delayed F0 peak in prenuclear position 2. Downstepping
	Tag Q	BEL (sp, p) CONF (sp, p)	L+H* L% (¿no?)	1. Delayed F0 peak in prenuclear position 2. Downstepping

Table 2. Sentence type, semantic definition, most common nuclear configurations, and continuous variable trends grouped by semantic meaning and prosodic associations.

The first semantic and prosodic subgroup consists of unbiased yes-no, inner negation questions, and outer negation questions, in which the speaker seeks confirmation of a proposition with or without a certain bias. These three question types differ only in the bias of the speaker at the moment of utterance: the speaker has no bias in unbiased yes-no questions, speaker infers ~p from the linguistic context in inner negation questions and is therefore biased against the proposition at the time of utterance, and the speaker is biased towards p based on existing world knowledge in outer negation questions. These question types are united by their H+L\* L% nuclear configurations and prenuclear peak displacement but differ slightly in other ways: unbiased yes-no questions show variation between L\*+H and L+>H\* pitch accents in initial position and have a hat contour generally resistant to declination. Inner negation questions show a more expanded F0, an initial L\*+H pitch accent with the F0 peak reached early in the utterance (generally by the second or third syllable), and a hat-shaped contour, and outer negation questions tend to show rising tones (L+>H\*) aligned with the initial

<sup>19</sup> I would like to clarify that I am not claiming these two nuclear configurations are the only possible nuclear configurations in Nicaraguan Spanish; rather, I am arguing that based on my data, these two nuclear configurations are the most commonly-used to encode relevant pragmatic information, namely, degree of speaker belief in a given proposition.

<sup>20</sup> Where QUES stands for question, sp stands for speaker, p stands for the proposition, INF stands for infers, CONF stands for confirms, BEL stands for believes, ASM stands for assumes, ASS stands for asserts, x stands for someone else and REJ stands for reject.

stressed syllable and exhibit more downstepping than unbiased and inner negation questions. These differences are not as clear-cut as the discrete nuclear configurations noted by Armstrong (2010b), which supported Büring and Gunlogson's (2000) distinction between inner and outer negation questions, but future studies focused specifically on continuous variable differences may be able to distinguish between the two sentence types with more certainty. For the moment, I can conclude that different nuclear configurations are not used in Nicaraguan Spanish to encode pragmatic differences between inner and outer negation questions.

Surprise and incredulous questions also pattern together semantically, as seen above, although the speaker's strong belief in incredulous questions causes it to overlap with the surprise question category, on the one hand, and the declarative category, on the other (see Table 2). Both surprise and incredulous questions reflect a belief of the speaker that is in opposition to the proposition of the other conversational participant, differing only in degree of that belief, brought about by the speaker's conviction in a proposition and degree of acceptance of the other conversational participant's claims. While semantically similar, the two question types show prosodic differences: the researcher believes that speakers utilize the H+L\* L% nuclear configuration in surprise questions to question the proposition while speakers are more likely to use the L+H\* L% nuclear configuration in incredulous questions to 'mock question' and nearly reject the proposition at hand. If the L+H\* L% nuclear configuration is used, the speaker's belief in the proposition is so strong that she ceases to ask a question seeking an answer, and therefore ceases to use the interrogative nuclear configuration.

Finally, I argue that declaratives and tag questions pattern together, as both reflect a proposition believed by the speaker to be true. Declaratives assert the belief in *p* while tag questions both assert *p* and seek confirmation of *p* from the other conversational participant. Prosodically, these sentence types exhibit a L+H\* L% nuclear configuration as well as prenuclear peak displacement and downstepping<sup>21</sup>, showing similarities to previous studies on the intonation of declaratives (see Prieto et al. 1996).

#### 4.9. Situating Nicaraguan Spanish in the Spanish-speaking World

The preceding paragraphs describe the most common nuclear configurations at play in *Granadino* Spanish, but how does the intonation in this dialect compare to intonational patterns across the Spanish-speaking world based on sentence type? This proves a difficult question to fully answer, as methodological factors, the influence of the investigator, and inherent inter- and intra-speaker intonational variability may skew the results. However, before concluding this section I would like to point to an interesting similarity between *Granadino* absolute-question intonation and Caribbean absolute-question intonation (based on Prieto and Roseano 2010), illustrated below in Table 3.

	<b>Dominican Spanish</b>	<b>Puerto Rican Spanish</b>	<b>Nicaraguan Spanish</b>
<b>Information-seeking yes-no questions</b>	H+L* H% or H+L* L%	¡H* L%	H+L* L%
<b>Counter- expectational yes-no questions</b>	H+L* H% or H+L* L%	L* HL%	H+L* L% or L+H* L%
<b>Confirmation yes- no questions</b>	H+L* H% or H+L* L%	H+L* L%	H+L* L%

Table 3. Comparison of the data in Prieto and Roseano (2010) with my own Nicaraguan data, showing the nuclear configurations found in Dominican, Puerto Rican, and Nicaraguan Spanish for information-seeking, counter-expectational, and confirmation yes-no questions.

<sup>21</sup> I argue that the tag question is declarative-like because its nuclear configuration parallels that of a declarative and both sentence types involve a high degree of speaker belief.

While methodological differences (namely a focus on somewhat different question types) impact the degree of dialectal comparison possible, a degree of overlap between Caribbean and Nicaraguan nuclear configurations appears to emerge. Contrary to Quilis (1985), who describes a cross-dialectal tendency for a final rise in absolute interrogative questions in Spanish, a final fall seems to be common in Caribbean and Nicaraguan Spanish. In light of other dialectal features Nicaraguan Spanish shares with Caribbean Spanish, such as rates of /s/-aspiration (Lipski 1994), it stands to reason that certain parallels exist between Caribbean and Nicaraguan intonational contours as well. The level of similarity among absolute questions should be studied in more detail in the future, but my data seem to support an intonational resemblance that deserves further exploration.

## 5. Conclusion

This study has allowed for an analysis of the intonation of absolute question types within the city of Granada, Nicaragua. The results indicate that two main nuclear configurations are at work in *Granadino* questions: H+L\* L%, the ‘question nuclear configuration’, is used by the speaker to question or confirm a proposition, and L+H\* L%, the ‘declarative nuclear configuration’, is indicative of the speaker’s belief in and assertion of a proposition. Contrary to Armstrong (2010b), different nuclear configurations are not found between inner and outer negation questions, nor are clear differences in nuclear configuration found between surprise and incredulous questions. However, the researcher hypothesizes that the strength of the speaker’s belief in p or ~p can result in a shift of nuclear configuration between surprise and incredulous questions: the stronger the participant’s belief regarding a proposition, the more likely the speaker is to use a declarative L+H\* L% nuclear configuration to ‘mock question’ the other conversational participant’s statement to the contrary.

In addition to nuclear configurations’ importance for teasing apart pragmatic meaning, continuous variables play a crucial role as well. Although the use of continuous variables overlaps across sentence types, the frequency of their use may provide clues to the speaker’s beliefs and biases at the time of utterance. For example, surprise questions and incredulous questions appear to differ greatly in F0 excursion: surprise is indicated by an expanded F0 while incredulity is indicated by a compressed F0. Unbiased yes-no, inner negation and outer negation questions differ in their prenuclear alignment: inner negation questions display a preference for an initial L\*+H pitch accent with the F0 peak reached within the first few syllables of the utterance, outer negation questions tend to exhibit an initial L+>H\* pitch accent, a rising F0 associating with the stressed syllable, and unbiased yes-no questions show more regular variation between the two. Outer negation questions can also be distinguished by their higher rate of downstepping, while inner negation questions show a more expanded F0 in their hat-shaped contours than unbiased yes-no questions. Declaratives and tag questions tend to downstep across the utterance more than any other sentence type. In sum, while nuclear configurations may not always vary based on sentence type, other intonational cues can be drawn upon to distinguish between different sentence types (see Face 2007, Henrikson 2010).

Finally, this study has attempted to situate Nicaraguan intonation within the Spanish-speaking world by highlighting similarities between Nicaraguan and Caribbean absolute interrogative intonation, although a direct comparison can prove difficult based on methodological factors. Identical nuclear configurations appear in several distinct sentence types in Puerto Rican, Dominican, and Nicaraguan Spanish, as shown in Table 3, suggesting intonational commonalities in addition to shared segmental features such as /s/-lenition. Future studies incorporating the same methodology across dialects should target these possible intonational similitudes in absolute questions to more thoroughly investigate this possible relationship.

While this study has garnered preliminary conclusions about *Granadino* intonation, a more detailed analysis is still needed. Primarily of note, the proposed nuclear configurations in this study must be subjected to internal and final tonal clash to verify their status at the phonological level (see Arvaniti and Ladd 2009, Henriksen 2012). In addition to manipulation of the data, consultants’ intuitions about the different sentence types are crucial to determine how speakers associate intonation with meaning; this will be particularly important to tease apart the distinction between surprise and incredulous questions. If the researcher’s predictions hold true, the L+H\* L% nuclear configuration will signal the speaker’s near rejection of the other conversational participant’s proposition due to the speaker’s stronger belief in ~p. Of course, there may be some overlap among the two question types as they form a continuum of degrees of belief, but consultation sessions with native *Granadinos* should

be illuminating, showing whether they sense a difference in speaker beliefs between the two prosodic realizations. Based on an initial consultation with a Nicaraguan, I believe the difference will be noticeable and meaningful to *Granadinos*, and a perceptual test should provide answers to this difficult question.<sup>22</sup>

In future studies, a more thorough account of the continuous variables' relationships with different sentence types should be provided, providing percentages of association to make these interactions more transparent. Specifically, the syllables perceived to differ in length should be measured and compared<sup>23</sup> (e.g. incredulous questions' nuclear syllable and surprise questions' nuclear syllable) and perceptually different F0 excursions should be measured as well (e.g. inner negation's F0 excursion, which is perceived to be greater, compared to outer negation and unbiased yes-no questions' F0 excursion.) Additionally, a detailed analysis of degree of displacement may also separate seemingly phonologically similar contours. These more detailed measurements will create a better understanding of the continuous variables' association with different types of sentences and their role in determining these distinct sentence types.

Finally, I would like to expand upon the present study by collecting data on native speakers' production of different sentence types in other regions of Nicaragua. Most intonational studies to date within the field of Hispanic linguistics offer broad descriptions of a country's intonational patterns based on data collected in one urban area, and the expansion of this study will allow for a critique of this approach. A comparison of nuclear configurations and continuous variables across different urban and rural spaces of Nicaragua and their associations to different question types should, ultimately, either support or call into question the validity of generalizing intonational contours of a particular area to an entire country.

This paper has contributed to the linguistic community's knowledge of intonational variation within the Spanish-speaking world, documenting the most common contours across seven sentence types in a highly understudied dialect of Spanish. In light of recent publications documenting intonation in different dialects of Spanish (Prieto and Roseano 2010), the present study fills a void in the literature on Nicaraguan Spanish absolute interrogative intonation and proposes semantic relationships that govern the use of declarative or interrogative nuclear configurations. I call for future studies to continue building bridges between meaning and intonation, which will enable Hispanic linguists to determine the most important cross-dialectal semantic and pragmatic factors guiding intonation production.

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<sup>22</sup> A perceptual test may also provide answers about the nuclear configurations that occurred less frequently for each sentence type, determining if these less frequent productions encode pragmatic meaning as well or if they are simply different interpretations of each task item.

<sup>23</sup> In future comparisons, vowel types and consonantal segments should be controlled, as these are factors influence duration (Hualde 2005).

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