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THE EFFECTS OF BILINGUALISM ON INTONATION IN GALICIAN AND SPANISH

By

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This work is dedicated to my family, friends and professors who always support and motivate me.

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ABSTRACT

This thesis examines the intonational behavior of Galician-Spanish bilinguals in the production of yes/no-questions in Spanish and Galician. Considering that Spanish and Galician have been in contact since the early middle ages (Ramallo, 2007), it is likely that this intense contact has resulted in longstanding effects (Thomason & Kaufman, 1988). Previous research on intonation and language contact has shown that intonation can be affected by contact with another language (e.g., Bullock, 2009; Elordieta, 2003; Elordieta & Calleja, 2005; Muntendam & Torreira, 2016; Simonet, 2011). However, the precise outcome of language contact might differ from case to case. Thus, this study investigates the intonational contours attested in Spanish-Galician bilinguals for yes/no-questions while considering the effects of age, gender and language dominance on the intonation of these questions. Although yes/no-questions in many varieties of Peninsular Spanish are characterized by having final-rising intonation (Face, 2004, 2006; Navarro Tomas, 1974; Prieto, 2004; Quilis 1988, 1993; Sosa, 1999), Galician and varieties of Spanish in Northern Spain show falling contours (Cantabria: López-Bobo & Cuevas-Alonso, 2010; Asturias: Alvarellos Pedrero et al., 2011; Troncoso-Ruiz & Elordieta, 2017; Basque Country: Elordieta & Romera, forthcoming; Robles-Puente, 2011; Galicia: Fernandez Rei, 2019; Perez Castillejo, 2012).

A yes/no-question elicitation task based on the one used in Muntendam & Torreira (2016) was used to collect data produced by 19 Spanish-Galician bilinguals. Data were recorded and analyzed acoustically to examine the intonation patterns they produced in 2,553 tokens (1,330 in Spanish and 1,223 in Galician). Participants completed the Bilingual Language Profile (Birdsong, Gertken & Amengual, 2012) to determine their language dominance.

Findings showed that three main contours were produced in both Spanish and Galician: rising L+H* HH%, falling H+L* L% and alternate rising L* HH%. Data were analyzed statistically and results showed that most participants used the same intonation in their two languages. There were also significant effects for age (older participants produced more falling contours), gender (male participants produced more alternate rising contours) and language

dominance (Galician-dominant participants produced more falling contours). These findings contribute to the limited literature on intonation patterns of yes/no questions in Galician Spanish and Galician as well as to the limited research on the prosodic effects of language contact in Galicia.

CHAPTER 1

INTRODUCTION

The current thesis aims to study the intonation contours Spanish-Galician bilinguals produce in yes/no-questions in Spanish and Galician. This is an area that has not been investigated in much detail. The bilinguals who live in Galicia live in a region where two languages have been in contact for hundreds of years. In situations such as this, elements from one language can be transferred to the other language. Factors such as intense language contact, age, gender and language dominance can influence which characteristics are passed from one language to another (Thomason and Kaufman, 1988). Data were collected using a question elicitation game played in pairs in both languages.

This chapter is organized as follows: Section 1.1 discusses the history of language contact between Galician and Spanish. Section 1.2 provides information regarding the sociolinguistic situation in Galicia including language attitudes, proficiency levels across age groups and bilingual education. Section 1.3 points out similarities and differences between Spanish and Galician and Section 1.4 defines and discusses language transfer and provides examples of prosodic transfer across languages that have a history of being in contact with one another. Finally, Section 1.5 offers an overview of the remaining chapters of the current thesis.

1.1 History of Spanish and Galician Contact

Galician is spoken in the northwestern region of Spain just north of Portugal in a region called Galicia. Galician and Spanish have co-existed in Galicia since the Early Middle Ages when Galician became an independent Romance language (Ramallo, 2007). Galician was used across the region for daily communication and was mostly an oral language, but it does have a short literary history. The most notable literature was written between the 13th and early 14th century, but this coincided with the introduction of the Castilian variety of

Spanish in the region and thus did not gain popularity in higher classes due to pressure from the Spanish monarchs.

According to Ramallo (2007) the Spanish Crown attempted to unify all of its territories under one common language throughout several points in history. In 1230, Fernando III made Galicia a Spanish territory. The implementation of the Spanish language took several centuries, but the incremental change was evident as formal registers began to change due to political, religious and economic interests. The higher classes began to abandon Galician for Castilian Spanish.

The next kings to severely target Galicia and its language were the Catholic kings in the late fifteenth century. Time passed, pressure lessened and then the Bourbon dynasty suppressed the use of the language again in the 18th century. In the 19th century, there was a Galician literary resurgence, but it targeted mostly lower classes including farmers and sailors, which did not help the language's prestige (Porto Dapena, 1977). In the 20th century, Franco banned the use of the Galician language (as well as other regional languages in Spain) and it wasn't until the implementation of the 1978 Constitution that Galician became a co-official language in Spain.

Regardless of its gradual decadence, Galician continued to be the oral language of the majority of the population of Galicia until the early 20th century (Ramallo, 2007). It was the reign of Franco that created a generational gap which divided those who learned Galician at home but were not allowed to speak it publicly and those post-Franco who learned it in school but didn't use it at home. Despite this generational gap, Hualde and Prieto (2015) state that Galician-Spanish bilingualism is universal in Galicia. Galicians have varying degrees of competence in the two languages, but all are bilingual to some extent. *The Instituto Galego de Estatística* (2018) reports that 98.12% of the population understands Galician and 88.05% know how to speak it (57.59% speak it a lot, and 30.46% speak it sufficiently).

1.2 Sociolinguistic Situation in Galicia

Centuries of attempts at linguistic uniformity across the Iberian Peninsula is what caused Galician to suffer fragmentation. The Linguistic Normalization Law of 1983 declared Galician

a vehicular language for instruction and allowed for the creation of the first bilingual schools. Regueira (1978, pp. 195) notes that this law contains a phrase that has caused some political tension: "all Galicians have the right and the obligation of knowing the Galician language". The issue is that some people believe that having the right to know how to speak the language does not imply that one has an obligation to know how to speak it. This effort to implement a uniform Galician language was considerably difficult to do when the varieties spoken at home are different from the normative Galician taught at school. This standardized variety is so new that the Real Academia Galega, which dictates what the correct orthographic norms are, wasn't even created until the beginning of the twenty-first century. After centuries of oppression, piecing back together a language to create a normative Galician may make the language seem artificial which results in its rejection by speakers of other varieties.

Although normative Galician is rejected by some (Regueira, 2009, pp. 195-199), its implementation in schools has undoubtedly increased the number of speakers as well as literacy rates among language users. Instruction in both Spanish and Galician greatly varies across schools in the region because the language that is chosen for instruction is based on the L1 (first language) of the majority of the students. This is how the language of instruction is chosen in preschool and primary school (Montrul, 2013). In secondary schools, social sciences, physics, chemistry and math are taught in Galician and all other courses are taught in Spanish. Galician instruction even continues at the university level in universities such as University of A Coruña and University of Santiago de Compostela.

Normative Galician is the variety of Galician used in academic environments. It is supposed to be a standard variety that all Galician speakers can subscribe to, but it faces difficulties with seeming artificial. Mariño Paz (2017, p. 535) states that the principles which guided the creation of normative Galician were the following: (1) Normative Galician must be based on popular spoken Galician and must rid itself of Spanish characteristics; (2) Normative Galician must be based off of several varieties so that the majority of Galicians identify with it and not just those of a particular variety; (3) The normative variety must make a formidable bridge between historic Galician and that found in modern literature; (4) Varieties of Galician chosen to form part of the new normative language must work harmo-

niously with Spanish and Portuguese [1]. Although, some parts of Galician were recreated to an extent in an effort to group together all Galician, varieties, the creation of these rules results in a normative variety of Galician which could be taught formally in the regional school system.

The the creation of normative Galician for use in academic and official settings had several consequences. According to Iglesias Álvarez (2002), works on linguistic attitudes (e.g, Regueira, 1978, pp. 195-200) show that there are dichotomous views towards the creation of a bilingual education system. Some believe it to generate Galician pride and others believe that Galician schooling reduces students' opportunities of economic advancement. This is due to Galician having been known historically as the speech of rural communities and lower classes in Galicia.

Despite those views, according to the 2013 Survey on Household Living Conditions, performed by the Galician Institute of Statistics, over 2 million of the 2.8 million inhabitants of Galicia speak Galician in their everyday life. In an earlier study, Rei-Doval, Fernández Rodríguez, Rodríguez Neira, Fernández Ferreiro, Fernández Ramallo, and Recalde Fernández (1994) stated that 86% of Galicians speak Galician and that 97% of them understand it. 62.4% of the population learns Galician as their first language, 25.6% learns it as their second language (Spanish as their first), and 11.4% acquire it as their L1 alongside Spanish. The remaining 0.6% of the population acquires a different L1. Even though there is a cross-generational decrease of Galician speakers, there is an increase in Galician language literacy rates (Instituto Galego de Estatística, 2019). As one of the participants of this study eloquently put it, "te lo meten hasta en la sopa", translating to 'it (Galician) is put even in the soup'. He was referring to the drastic increase of Galician in ad campaigns and scholastic materials eliciting pride of cultural identity.

[1] Original Galician text of the principles which guided the creation of normative Galician (Mariño Paz, 2017): (1) A lingua normative débese basear na lingua falada e popular, maid depurándoa de castelanismos. (2) O galego normativo ten que ser supra dialectal. Para que a maioría dos galegos se identifiquen con el, non pode inspirarse nunha variedade xeolectal. (3) Esta variedade debe enraizarse nas boas tradicións da lingua antiga e da moderna, pero sen caer na adopción de formas mediavais xa periclitadas. (4) As variantes seleccionadas para a variedade normativa teñen que gardar coherencia interna, e además, deben ser harmónicas coas das otras linguas, especialmente coas románicas e, sobre todo, coa portuguesa.

The Galician Institute of Statistics published its most recent findings from 2018 regarding habitual language use in Galicia. They found that older populations are more likely to only speak Galician as their habitual language, and that younger people are more likely to only speak Spanish as their habitual language. These tendencies held true as well for speakers who use both languages habitually. Older people who use both languages habitually were more likely to use Galician more and younger people who use both languages habitually were more likely to use Spanish more. Table 1.1 illustrates these data.

Table 1.1: Percentage of Language(s) Spoken in Galicia by Age (Based on Instituto Galego de Estatística, 2019)

Age	**Only Galician**	**Only Spanish**	**Gal. > Spn.**	**Spn. > Gal.**
Years	[%]	[%]	[%]	[%]
5-14	14	44	12	30
15-29	19	32	18	31
30-49	24	27	21	28
50-64	33	20	25	22
65+	48	14	25	13

Additionally, the Galician Institute of Statistics found that 12.6% of people can understand Galician but cannot write in the language and that 1.88% of people understand but do not speak Galician at all. This shows the impact bilingual education has had in the region.

Since the Linguistic Normalization Law, Galicia has experienced the implementation of several changes. Article 10 of this law called for the reinstitution of Galician names to cities that had Spanish names replace their Galician names. For example, La Coruña is now A Coruña. Here is where political disagreement becomes problematic for the creation of normative Galician. There are two groups in Galicia: the *reintegracionistas* 'reintegrationists' who believe that Galician has more in common in Portuguese, and the *aislacionistas* 'isolationsists' who believe that Galician shares more with Spanish. Reintegracionistas believe the spelling should be *A Corunha*, reflecting Portuguese orthographic characteristics. Aislacionistas, on the other hand believe the spelling of the city's name should be *A Coruña*, resembling the *ñ* found in *España* (Porto Dapena, 2001).

According to Porto Dapena (2001), the Galician language has long been associated with the rural, lower class and has been depicted in Spanish literature by characters who are clumsy, uncultured and ingenuous. He even notes that a young Galician person looking for a job in television, theater or radio may face a difficult time finding a place that will hire them if they do not leave their accent behind. Unfortunately, it is this accent that is linked to these unfavorable characteristics.

1.3 Similarities and Differences Between Galician and Spanish

Galician has many similarities to Spanish, most notable lexical similarities, but it also shares similarities with Portuguese due to its geographic proximity and interlaced history. Like Spanish, Galician has morphological gender markings (feminine, masculine and neuter). It has gender agreement between the determiner, noun and adjective as well as number agreement. It has rich verb morphology with person, number, tense-aspect and mood marking. Galician also has plural morphological marking and augmentative and diminutive suffixes on nouns and adjectives. Another similarity between these two languages is that Galician in a pro-drop language, meaning that the subject can be dropped because it has already been coded for morphologically (Perez-Pereira, 2008).

With regards to word order, Galician follows patterns closer to Portuguese than Spanish. In declaratives and interrogatives (which are predominantly SVO), the object pronoun usually follows the verb in an enclitic pronoun. However, in other clauses, such as subordinate and negative, the pronoun precedes the verb. Distinct from both Portuguese and Spanish, Galician does not have composite past verbal forms such as *haber* + past participle (Perez-Pereira, 2008).

Lexically speaking, Spanish and Galician often coincide. For example, un litro de aceite 'one liter of oil' is the same in both languages. "Galleguizaciones", as Porto Dapena (2001) describes, may also occur when phonetic characteristics of Galician are applied to Spanish to invent words such a *conexo* 'rabbit' (Spanish: conejo, Galician: coello) and *reduxo* 'reduced' (Spanish: redujo, Galician: reduceu).

Overall, it is clear that there are linguistic and sociolinguistic consequences of Spanish and Galician having an intertwined history, sharing the same region for hundreds of years. Spanish is the dominant language with more positive attitudes due to its association with higher education and higher economic status whereas Galician has historically been the minority language used orally by the common folk although it was publicly prohibited in part of the past century. The efforts being made to revive this language can be seen though the creation of bilingual schools, the restoration of Galician names to cities, and regional ad campaigns meant to elicit regional pride (such as those found in other bilingual regions of Spain like Catalonia or the Basque Country) as seen by the author during data collection. However, considering that Galicians have a history of being depicted as having high poverty levels and lower education, their language has the misfortune of being affiliated with said stereotypes and eliciting regional pride with this language has its challenges.

1.4 Language Transfer

The current study investigates whether there is transfer present in Galician intonation from contact with Spanish and/or whether there is transfer to Spanish intonation from contact with Galician. When languages are in contact, there can be different linguistic outcomes, like transfer and borrowing. Thomason and Kaufman (1988) discuss what is more likely in what situation and what factors affect the outcome. Thomason and Kaufman (1988, pp. 37-42) define borrowing as what happens when native speakers of a language incorporate foreign features into their first language (L1) and maintain a changed version of the L1 with the incorporated features. They note that for borrowing to take place, the borrowing language has to have a long-standing history of several hundred years of intimate contact with the language it is borrowing from. Additionally, the borrowing of features from one language to another is dictated by various social factors such as attitudes, prestige, long-term bilingualism, level of bilingualism and population size. Transfer, on the other hand, as defined by Winford (2003, pp. 345) is the result of L1 influence on the target language from the perspective of the target language. In other words, the difference between borrowing and transfer is that borrowing occurs when a lexical item (or other linguistic feature) is taken from

a source language and used in the recipient language by a speaker who has more knowledge of the recipient language (Van Coetsem, 1988, pp. 10) and transfer occurs when a speaker's L1 influences his L2. Another term that is important to define is interference which is similar to transfer, but has more wide-spread repercussions. Thomason and Kaufman (1988, p.39) define interference as what happens when a group of speakers fail to learn a target language perfectly during a language shift. The errors made by these speakers in the target language are then imitated by the original speakers of the language, thus spreading the errors made by members of the shifting group to the target language as a whole.

According to Hickey (2012), contact is responsible for more than just transfer of lexical and syntactic characteristics. He defines contact-induced change as change which would not have happened outside of a specific contact situation and notes that there are three important linguistic predictors for change caused by language contact: typological distance, universal markedness and degree of integration within a linguistic system. The greater the typological distance, the easier it is to see that the change is due to language contact. Markedness is related to how easy a feature is to learn (marked features are easier to learn than marked features) as well as frequency of cross-linguistic occurrence (marked features are less common) and age of acquisition (marked features are acquired after unmarked features). Degree of integration within a linguistic system is also important because the less integrated linguistic subsystems are, the more common contact-induced change is. Inflectional morphology for example is very integrated, and thus less commonly affected by contact-induced change (Hickey, 2012). Similarly, Thomason (2001, p. 62) defines contact-induced change as any linguistic change that would be less likely to occur outside of a particular contact situation.

According to Thomason and Kaufman (1988), anything can be transferred under the right sociolinguistic circumstances. Thomason and Kaufman describe a borrowing scale divided into five categories based on the degree of language contact. Category 1 occurs in casual contact and category 5 occurs in intense contact. Content words fall under category 1. Function words, minor phonological features and lexical semantic features fall under category 2. Derivational suffixes, phonemes and adpositions fall under category 3. Word order, inflectional morphology and distinctive features in phonology fall under category 4. Finally,

significant typological disruption and phonetic changes fall under category 5. Although intonation is not specifically discussed in the Borrowing Scale, it can be assumed that intonation fits either in category 4 or category 5 which involve intense contact.

Other researchers, such as Anderson (1983), Otheguy (1995) and Silva-Corvalán (1998), do not agree that anything can be transferred. Silva-Corvalán (1998) focuses on morphosyntax and argues that a grammatical system may incorporate foreign structures if they are somehow compatible with the structure of the borrowing language. She believes that lexicon and pragmatics is what is transferred, not syntax.

Matras (2009) argues that borrowing does not occur because of the convenience or inconvenience of the structure, nor because of social or cultural attitudes, but rather because of the language-processing mechanism itself. The speaker borrows because he/she wishes to recreate the specific contextual associations the donor-language word-form offers. For example, certain lexical items from one's first language may elicit feelings and be associated with a certain history that just doesn't make sense contextually in one's second language. For example, although *croqueta* has the translation 'croquette', it will always be a *croqueta* to some Spanish-English bilinguals even if they are familiar with the word 'croquette' in English. This is where history of one's lexical use is important.

The direction of transfer is usually from the region's majority language to the minority language. In diglossic situations, elements from the more prestigious language (usually the majority language) tend to get transferred to the less prestigious language (Gugenberger, 2008). Ferguson (1959) describes diglossia as a linguistic situation in which two language varieties are used in distinct circumstances. One variety has higher prestige, a strong literary history, and is learned through formal education for written and formal speech. The other variety has less prestige and is used for ordinary conversations. This applies to Spanish and Galician because younger generations of Galicians in bigger cities go to bilingual schools and while the formal instruction is in Galician, the students speak amongst themselves in Spanish. The Instituto Galego de Estatística (2019) shows this through data that indicates that younger Galicians speak less Galician than older Galicians. This is despite the increase of formal education in Galician.

Returning to the discussion on transfer, the first elements to get transferred from the dominant language are lexical items. Over time, even the syntax and morphology of the dominant language can get transferred to the minority languages (Thomason & Kaufman 1988, p.37-39). In areas that are more bilingually balanced, the transfer is bidirectional and mixed varieties of both languages are created. For example, there can be an Asturianized Castilian Spanish or a Castilianized Asturian that are mixtures of pure Asturian and pure Castilian Spanish as noted by D'Andrés (2000, p. 77) and Pérez Fernandez (2006, p. 250). This ties in with the borrowing scale.

Recent studies on prosody in contact situations (which will be discussed more in depth in Chapter 2) have shown that the prosodic features of a language can be affected by another language with which it has a history of contact. Prosody refers to the patterns of stress, rhythm and intonation in a language. Examples of speakers transferring intonation from one language to another are documented in Bullock (2009) on French and English in Frenchville Pennsylvania, Elordieta (2003) and Elordieta and Calleja (2005) on Basque and Spanish, Muntendam and Torreira (2016) on Spanish and Quechua in Peru, Simonet (2011) on Catalan and Spanish, among others. Studies such as these which exemplify prosodic transfer, can be linked to Thomason and Kaufman's borrowing scale because the two languages in each of these studies have a long history of contact. Therefore, using the prosody of one language in another language can happen when there is intense contact between the two languages. As will be discussed in the following chapter introducing intonation, Galician and Peninsular Spanish differ greatly in intonation patterns, specifically in yes/no-questions (also known as absolute questions).

Even though Galician is a minority language, there is evidence that suggests the existence of transfer from Galician to Spanish across several domains. For instance, there is a degree of periphrastic transfer from Galician to Spanish (Álvarez Cáccamo, 1983). In this study, Álvarez Cáccamo showed that Spanish speakers in Galicia can be heard using the periphrasis *dar* + past participle (give + past participle), a construction that does not exist in standard Spanish. For example, the periphrasis *doy hecho* 'can complete' in the sentence no *doy hecho*

todo el trabajo 'I cannot complete all of the work' is used instead of the modal periphrasis *soy capaz de/puedo* 'I am able to' (Chamorro, 2012).

There are also examples of lexical borrowing from Galician to Spanish of the region, like how common it is to say *pota* for 'pot' while speaking Spanish, although it is a Galician word. Other phenomena such as *gheada* or *seseo*, which are common in some varieties of Galician, transfer over to Spanish when spoken by Galician L1 bilinguals. This, however, is far less common in native speakers of Spanish in Galicia (Rojo 2004). Regueira (2009, p. 158-161) defines these two terms. *Gheada* is the debuccalizing of the voiced velar stop /ɡ/ to a voiceless pharyngeal fricative [ħ] and *seseo* is the constant use of alveolar fricative [s] instead of the distinction between /s/ and interdental fricative /ɵ/.

Influence from Spanish to Galician is also common. Many examples of Spanish lexical transfer can be found in normative and non-normative Galician varieties. For example, instead of using the words ventá or fiestra for 'window' it is common to hear the Spanish word ventana (Porto Dapena, 2001). Some examples of Spanish lexical transfer and borrowing has become so widely used in Galician that native speakers no longer perceive them to be such. Some people may refer to this as 'Castrapo', or the mixing of Galician and Spanish (Gugenberger, 2008).

Besides syntactic and lexical influence like the examples mentioned above, prosodic transfer from Galician to Spanish has also been documented. Prosodic transfer will be discussed further in the Chapter 2, including the transfer of intonation, which is the focus of this thesis. With regards to intonational transfer, it is of importance to note that studies such as Fernandez Rei (2016) and Rodriguez Vazquez (2018) found results showing that there was direct transfer from Galician to Spanish. However, it is possible that these studies did not find transfer from the other direction because they did not take into consideration sociolinguistic factors into their studies such as age, gender, language dominance, language use and language attitudes. There very well could be transfer vice-versa. For this reason, a phonetic study taking into account sociolinguistic factors needs to be carried out. Additionally, the current study aims to offer more prosodic information of Galicia's Spanish because previous studies have focused more on describing Galician intonation than Spanish intonation.

1.5 Overview of the Thesis

The current study investigates Spanish-Galician bilinguals' intonation contours in yes/no-questions in both languages. There are many types of yes/no-questions, but the current study specifically examines the intonation contours of information-seeking-yes/no-questions. The task created for the current study elicits the production of this question type in Galician and in Spanish. The questions were analyzed acoustically and were compared across the two languages to see if there are differences in intonation patterns across languages and across participants based on language, language dominance, age and gender.

The organization for the remaining chapters is as follows: Chapter 2 provides a review of the relevant literature on intonation of yes/no-questions in Galician and in Peninsular varieties of Spanish. This chapter also reviews the intonation framework used and provides the motivation for the current study, the research questions and the corresponding hypotheses. Chapter 3 outlines the methodology. This includes information on the participants, materials used, procedures taken and how the data analysis was performed. Chapter 4 reports the findings of the study. Chapter 5 offers a a summary of the main findings from the data, a discussion of the findings, the main findings from the data, limitations of the study and directions for future research.

CHAPTER 2

YES/NO-QUESTIONS IN SPANISH AND GALICIAN

This chapter reviews the background information on intonation patterns of yes/no-questions in Peninsular Spanish and Galician. Section 2.1 introduces the term intonation and discusses the prosodic framework used in the current study. Next, Section 2.2 focuses on the contours of yes/no-questions in Peninsular varieties of Spanish. Section 2.3 then focuses on the contours of yes/no-questions in Galician. Section 2.4 covers the intonation patterns found specifically in yes/no-questions of Galician Spanish. Next, Section 2.5 discusses examples of intonational transfer of languages in contact. Finally, Section 2.6 discusses the motivation for the current study as well as the research questions and corresponding hypotheses.

2.1 Intonation

Allen (1971, p.74) defines intonation as the quality of language that includes melody and rhythm produced by height changes in tone (highs and lows), stress, volume and duration. Levis (1999) adds to this definition noting the importance of final rising versus final falling pitch (voice quality determined by the rate of vibrations produced) which convey pragmatic meaning in some languages. This makes intonation an important communicative tool. Quilis (1993) notes that intonation is also socially representative and allows for individual expression at the sentence level. Following Quilis's definition, intonation serves three functions: a linguistic function, a sociolinguistic function and a self-expression function. The linguistic function refers to for instance the ability intonation has to differentiate between declaratives and yes/no-questions, an otherwise lexically identical pair of sentences in some languages, such as Spanish. Consequently, utterances such as *Eres de Galicia* 'you are from Galicia' and *¿Eres de Galicia?* 'are you from Galicia?' are only differentiated by intonation. According to Hualde (2005), intonation differences across varieties of Spanish are clearest in

the intonation of yes-no questions. The sociolinguistic function mentioned in Quilis refers to how intonation can offer personal information regarding the speaker's gender, age, place of origin, education level and social group. Finally, the self-expression function refers to the varying intonation patterns used within different sentence types such as *wh*-questions, tag-questions, exclamations, among other sentence types. Although certain sentences may follow the same structure syntactically, they may offer different meanings or insights to the speaker's feelings.

The annotations for the current study follow the SP_ToBI labeling system (Beckman, Diaz Campos, McGory, Tevis and Terrell, 2006; Hualde and Prieto, 2015). The Spanish ToBI labeling system (Sp_ToBI) is used for the prosodic, phonetic and intonational annotation of Spanish speech. The ToBI annotation system (Tones and Break Indices) was first designed for the prosodic annotation of English (Pitrelli, Beckmand and Hirschberg, 1994). In recent years, following ToBI conventions has become common practice and specific ToBI annotation systems have been created for many different languages. As Hualde and Prieto (2016) cite: there is an English ToBI (Beckman et al., 2005), a Dutch ToBI (Gussenhoven, 2005), a German ToBI (Grice et al., 2005), a Japanese ToBI (Venditti, 2005), a Greek ToBI (Arvaniti and Baltazani, 2005), a Korean ToBI (Jun, 2000), a Chickasaw ToBI (Gordon, 2005), a Bengali ToBI (Khan, 2014), a Basque ToBI (Elordieta and Hualde, 2014), a Portuguese ToBI (Frota, 2014), a Catalan ToBI (Prieto, 2014), and a Spanish ToBI (Beckman et al., 2006; Hualde & Prieto, 2015). ToBI consist of annotating speech by separating pitch accents and boundary tones.

Nuclear pitch accents refer to the last stressed syllable of an intonational phrase. These are marked with the direction of the contour (L for low or H for high or a combination of the two like L+H* which shows a bitonal syllable) followed by an asterisk. The asterisk marks a syllable containing a pitch accent. Boundary tone marks the end of the intonational phrase and it is marked with the direction of the contour (L or H or a combination of the two) and a percent symbol %.

The current study focuses on the intonation patterns of information-seeking yes/no-questions. These are questions that ask for specific information and require either a yes

or no as an answer, such as the previously mentioned example: *¿Eres de Galicia?* 'are you from Galicia?'. Martínez Celdrán, Fernández-Planas and Carrera-Sabaté (2003) describe how intonational contours of yes/no-questions are analyzed. The nuclear tone is found in the last stressed syllable of the intonation group. When the nuclear tone is not the last syllable in the group (words with penultimate stress for example), the nuclear pitch movement continues in the post-tonic syllable. In this study, the nuclear tone will be referred to as the nuclear pitch accent (the final pitch accent) and the rising or falling pitch on the last syllable in the intonation phrase will be referred to as the boundary tone. See Figure 3.10 for an example of annotation using Spanish ToBI.

2.2 Yes/No-Questions in Peninsular Spanish

Yes/no-questions in many varieties of Peninsular Spanish are characterized by having final-rising intonation (Face, 2004; 2006; Navarro Tomás, 1974; Prieto, 2004; Quilis 1988; 1993; Sosa, 1999). Final rising intonation is indicated with a rising boundary tone HH% and final falling is indicated with a falling boundary tone L%. However, northern varieties in the Iberian Peninsula do not follow this rising pattern. López-Bobo and Cuevas-Alonso (2010) note that regions such as Cantabria, Asturias, the Basque Country and Galicia all have descending intonation patterns quite different to those in the central part of the country use for these same questions. This is a relatively new finding considering that for the greater part of the last 45 years, it was thought that there was one standard rising intonation contour for yes/no-questions in Peninsular Spanish (Navarro Tomás, 1944; Sosa, 1999).

Navarro Tomás (1944) stated that most, if not all, varieties of Spanish have a sentence-final ascending contour (HH%) for yes/no-questions. Moreover, Navarro Tomás (1974) repeatedly made reference to one standardized "Spanish intonation", in which the pitch at the end of yes/no-questions across the Peninsula always rises. Sosa (1999) also reported that all Peninsular varieties of Spanish have a rising intonation in yes/no-questions from a low point on the last stressed syllable of an intonation phrase.

Other linguists were not as convinced that only one prosodic contour existed for yes/no-questions in Spain. Garrido (1996) conducted a corpus study based on two speakers of

Peninsular Spanish (no further regional information is given) and compiled lists of possible configurations that occurred across sentence types demonstrating that almost any kind of tonal pattern can appear in any kind of sentence. That is, she showed that falling patterns can also occur in yes/no-questions. This is a stark contrast to what was previously believed about all Peninsular varieties.

Now it is well known that intonation patterns in yes/no-questions vary greatly depending on the geographic location of the Spanish variety (Prieto & Roseano, 2010). Studies have found that Madrid and Castilian Spanish have similar final-rising L+H* HH% patterns for yes/no-questions. This contour means that the tone starts low and then rises within the last stressed syllable of the intonational phrase and continues rising in the boundary tone. Nearby Manchego Spanish also shares the final HH%, but can have different nuclear pitch accents (Henriksen, 2010), but other varieties of Peninsular Spanish, as well as other languages spoken in the Peninsula, do not share the same rising contour. Examples of yes/no-questions such as those in Cantabria (Lopez-Bobo & Cuevas-Alonso, 2010), the Basque Country (Elordieta & Romero, 2017; Robles-Puente, 2011), Manchego Spanish (Henriksen, 2010), Catalan (Martínez-Celdrán et al., 2007), A Fala in Extremadura (Masa Rodriguez & Elordieta, 2017) and Galician/Spanish of Galicia (Fernandez-Rei, 2011; 2016; 2019; Porto Dapena, 1977; Robles Puente, 2011) show very different nuclear configurations for yes/no-questions.

Starting with the region that previously generalized as 'standard Peninsular Spanish', Castilian Spanish is the variety of Spanish spoken in the central region of Spain including Madrid and its surrounding areas. Quilis (1988, 1993) analyzed yes/no-questions in Madrid Spanish, and identified a rising boundary tone. The yes/no-questions that he described had a medium tone at the beginning of the intonational phrase and then the pitch gradually descended until reaching the phrase's penultimate syllable. The pitch then rose on the final syllable of the intonational phrase. Sosa (1999) and Prieto (2004) shared similar findings. Face's (2004, 2006) results for Castilian Spanish also matched the intonations described in Navarro Tomás (1944) and Sosa (1999).

Face (2004) conducted a study with 5 participants from Madrid who partook in a reading task of declarative and interrogative sentences. Participants were each presented with 12 pairs of lexically and syntactically identical declaratives and yes/no-questions. The nuclear pitch accent for yes/no-questions was L* or L+H* followed by a HH% boundary tone. Face (2006) conducted another study on the intonation of yes/no-questions in Castilian Spanish, this time with 5 native Castilian Spanish speakers. They participated in a dialogue reading task totaling to 150 tokens of yes/no-questions. Results revealed that the most common intonation contour was similar to that found in his 2004 study, L+H* HH%. This contour shows a low pitch that rises in the stressed syllable followed by a rising boundary tone.

Estebas-Vilaplana and Prieto (2010) also described intonation patterns found in Madrid. Two female speakers, aged 42 and 45, each recorded 69 sentences (statements, yes-no questions,*wh*-questions, commands, requests and vocatives) elicited in a semi-spontaneous way. Results showed that information-seeking yes-no questions are characterized by a high rising nuclear configuration L* HH%. This is similar to the previous studies of yes/no-questions of the region, but they did not find a rise in the pitch accent.

Henriksen (2010) had very similar findings to those of Estebas-Vilaplana and Prieto (2010). Similar to Castilian Spanish, Manchego Spanish also has final rising intonation in yes/no-questions, but it may vary in nuclear pitch accent. Manchego Spanish is spoken in the province of Castile-La Mancha, just south of Madrid. Henriksen (2010) recruited 16 participants (8 males and 8 females) from the town of Socuéllamos in this province. Speakers participated in a reading task. In this computer-based task, a context was given to them to read on a slide, and the following slide contained a question they had to read aloud. A total of 795 yes/no-questions were analyzed. Participants produced either a low-rise pitch accent (annotated as L*) or a high-rise pitch accent (annotated as H*), but both had a rising HH% boundary tone.

These studies on Madrid, Castilian and Manchego Spanish show that there is a strong tendency to use a final-rising contour in yes/no-questions. As is seen in these studies, Spanish speakers in central Spain may not always produce the same nuclear configurations; there may be differences in their nuclear pitch accents in yes/no-questions.

As previously mentioned, northern varieties of Spanish, such as that found in Cantabria, demonstrate descending patterns in this same question type. Canellada (1944, 1984, as cited in López-Bobo and Cuevas-Alonso, 2010) makes an argument for there being a northwestern group of Peninsular Romance including Spanish spoken in Galicia, Asturias, the Basque Country and Cantabria Spanish. These regions show that there is a trend for speakers to use falling intonation for yes/no-questions.

Lopez Bobo and Cuevas Alonso (2009) found two intonation patterns used for information-seeking yes/no-questions in Cantabria. The two intonation patterns, one falling H* HL% and the other rising L* HH%, are found in two distinct areas. The falling pattern exists mostly in rural Cantabria and resembles intonation patterns common in northern Spain, while the rising pattern is found in more urban cities and resembles the intonation found in central Spain. There are also other regional differences, such as upstepping (unexpected rise in tone), which is found in Western Cantabria but not in the east. Lopez-Bobo and Cuevas-Alonso (2010) conducted another study with a larger set of data provided by 4 women from 2 towns in north-western Cantabria, which confirmed the results of their previous study.

Another northern variety of Peninsular Spanish is Asturian Spanish. Troncoso-Ruiz and Elordieta (2017) looked at Amestáu (the regional language of Asturias) and Asturian Spanish yes/no-questions. The final contour of yes/no-questions in both languages showed a high tone followed by a falling tone, which can start either on the nuclear accent or later in the boundary tone (H+L* L% or H* (H)L%).

Alvarellos Pedrero, Muñiz, Díaz, and González (2011) carried out a comparative study of declaratives and yes/no-questions in Amestáu across different regions of Asturias. These regions were divided as such: Gallego-Asturiano/Asturiano-Occidental/Asturiano centro-norteño, Asturiano centro-sureño, and Asturiano oriental. This study had 10 female participants (ages 25-50 years) who produced at total of 270 yes/no-questions. These three groups had distinct nuclear configurations, but all shared the common feature of a falling boundary tone. It is of interest to note that yes/no-questions in the Gallego-Asturiano group has a nuclear configuration of H+L* L%, which has been documented in Troncoso-Ruiz & Elordieta (2017) for Asturias and in Galician (Fernandez-Rei, 2016).

Lopez-Bobo et al. (2008) found similar results to Alvarellos Pedrero et al. (2011) across central and eastern varieties of Spanish in Asturias in both rural and urban settings. All boundary tones in their data were L%. Troncoso-Ruiz and Elordieta (2017) and Alvarellos Pedrero et al. (2011) conclude that there is a lack of high boundary tones both in Amestáu and Asturian Spanish (in both declaratives and yes/no-questions).

Another variety of Spanish is found in the Basque Country. Robles-Puente (2011) compared the intonation of Spanish yes/no-questions in the Basque country to yes/no-questions in Madrid Spanish. 5 male speakers and 1 female speaker were recruited from the Bilbao area. Two were high-functioning Spanish-Basque bilinguals, 3 were passive bilinguals (they understood but did not speak Basque), and 1 was a Spanish monolingual. The controls for this experiment were a male speaker from Madrid and a female from Puerto Rico. A yes/no-question elicitation task was used to collect data. Results showed that all speakers from the Basque Country, regardless of sex, age, or language background used a circumflex (rising-falling) pattern with a rising pitch starting at the onset of the accented nuclear syllable, followed by a post-nuclear peak and a low boundary tone. This pattern found in Bilbao Spanish resulted very different from the intonation attested in Madrid.

Elordieta and Romera (2017) studies the influence of social factors on the prosody of Spanish in contact with Basque. Data were collected from 12 participants (from Bilbao and San Sebastian) through semi-directed conversations in Spanish. Speakers were separated into 3 different groups (monolingual Spanish, L1 Spanish-L2 Basque and L1 Basque-L2 Spanish). The results based on 172 yes/no-questions showed that 79% of them had final configurations with a rising-falling circumflex contour: L+(¡)H* (H)L% and only 21% showed a final rising intonation. Additionally, they found a correlation between percentages of final rising-falling contours and the linguistic attitudes and the degree of contact with Basque of the participants. Specifically, speakers with a higher degree of contact and more positive attitudes produced more final falling contours

2.3 Galician Intonation

There are few studies that have looked at Galician prosody (Castro, 2003; Carril, 1973; Escourido Pernas, 2007; Fernandez Rei, 2007; Gupton, forthcoming; Porto Dapena, 1977; Rojo, 2004) and even fewer on the intonation of yes/no-questions in Galician (Fernández Rei and Escourido Perna, 2008; Fernandez Rei, 2016, 2019; Martínez Celdrán et al., 2007; Sobrino Perez, 1999). These studies indicate a falling contour in yes/no-questions in Galician, but not all contours are described to be exactly the same. In recent years, it has been proposed that there is more than one intonation pattern for yes/no-questions in Galician and there may be differences across subregions of Galicia.

One of the first studies describing Galician intonation, Carril (1973) asserted that the difference between declaratives and yes/no-questions in Galician is that the questions start with a more elevated tone than the former. The last accented syllable of the yes/no-questions Carril describes also has a longer duration than the declaratives. Carril describes these questions to be completely descending and not circumflex, unlike Elordieta and Romera (2017) in Basque Country Spanish, Sobrino Perez (1999) and Fernandez Rei (2016, 2019) in Galician, and Carrasco Gonzalez (1996) in A Fala.

Porto Dapena (1977) describes three different contours for three yes/no-questions (*é certo?* 'Is that true?', *é un bo peixe?* 'Is that a good fish?' and *vendiches a vaca?* 'Did you sell the cow?') in Galician. The first shows a rising-falling contour starting at a medium tone and rising in the syllable before the last tonic syllable of the sentence. The second shows a descending contour, which starts at a very high pitch and slowly descends until the end of the intonational phrase where the frequency of the F0 is much lower than it was at the beginning. Finally, the third type of contour starts high, descends after the first tonic syllable of the intonational phrase until the syllable prior to the last tonic syllable and then rises slightly. This is a notable finding, but no information was provided regarding the speakers that produced these sentences or how the data were collected.

More recently, Sobrino Perez (1999) did a study on eight Galician speakers (4 males and 4 females) from different towns in Southwestern Galicia (A Guarda, O Rosal, Oia e Tomiño) who asked 6 questions, only one of which was a yes/no-question. This leaves the study with

a total of 8 tokens for this particular question type. The researcher describes the descending contour found in most yes/no-questions in Galician as starting at a medium height at the beginning of the intonational phrase and maintaining this pitch until the nuclear tone. At the nuclear tone, pitch rises and then descends to a much lower point than which it started at. This low pitch continues throughout the boundary tone. This contour could be described as rising-falling or circumflex. This was not the only contour Sobrino Perez found. Results showed four different patterns: two circumflex patterns (one ascended in the nuclear tone and the other ascended twice), rising (similar to 'standard Madrid Spanish') and a falling pattern (i.e., without rise in the last stressed syllable). Three out of the fours contours showed final falling patterns except for the rising pattern which was used mostly by women. Sobrino Perez notes that there may be a correlation between subregions of Galicia and the different contours found in the study because these contours are not the same as the ones described by Carril (1973), Porto Dapena (1977) or Fernández Rei (1995). However, considering that she only had eight participants, a future study would require more participants and a higher number of tokens.

Fernández Rei and Escourido (2008) found three main intonation patterns in Galician yes/no-questions depending on subregions of Galicia: a Rías Baixas pattern, a Costa da Morte pattern and a common Galician pattern found in the rest of Galicia. The three patterns vary in pitch accent but all show a common L% boundary tone. The common Galician pattern shows the fall H+L* later in the syllable and the Costa da Morte pattern shows the fall H+L* early in the stressed syllable. It is only the Rías Baixas pattern that ascends in the final stressed syllable L+H*.

In Fernandez Rei (2016), 22 Galician participants did a discourse completion task (some in Galician, some in Spanish and some in both) and tended to show H+L* L% patterns in both Galician and Spanish. However, only 5 out of 22 participants in this study were bilingual and participated in both Galician and Spanish. These participants were young (20-25 years old) bilingual females students. The author suggests that since H+L* L% is found in both Galician and Galician Spanish, Galician prosody is transferred to Galician Spanish.

Martínez Celdrán et al. (2007) carried out a study on perception with the aim of comparing intonation patterns across Catalan, Galician, and Spanish from the Canary Islands and seeing which ones participants found to be normal, strange or impossible. One middle-aged female speaker from each region recorded a total of 12 phrases (declaratives and yes/no-questions) 3 times. An acoustic description of a woman from Santiago de Compostela shows that there is a difference between declaratives and yes/no-questions. The declaratives seemed to have two peaks and a fall of about 150Hz, whereas the yes/no-questions rise once from around 250Hz to 400Hz and then descended dramatically to about 150Hz.

What most researchers concur at the moment is that Galician yes/no-questions are asked with a falling intonation, but there is not much consensus as to the specific configuration. Perhaps there is more than one configuration as Porto Dapena (1977) and Sobrino Perez (1999) mention. There could be regional differences, as Fernández Rei and Escourido (2008) suggest. More research also needs to be done in order to determine if there are other factors (e.g., age, sex, language dominance, language background and language attitudes) which could cause this variation in prosody. Not to mention, perhaps speakers use different intonation patterns since Porto Dapena's (1977) publication.

Although the following study is not on Galician, it describes A Fala which is a Galician-Portuguese language branch found in Caceres, Extremadura Spain. A group of migrants brought the language to the Sierra de Gata region of Extremadura in the 14th century. Carrasco González (1996) proposes that this is the third language of the Galaico-Portuguese language family. This is an oral language with 5,500 speakers. Masa Rodriguez and Elordieta (2017) studied the speech of 12 falantes (speakers). For this study, they conducted two types of interviews: one for semi-spontaneous speech (64 tokens) and another one for read speech (82 tokens). For semi-spontaneous speech they found that 52% of questions were asked with a circumflex (rise-fall) L+H* L% contour. Another 14% of the data showed falling intonation (9% L* L% and 5% H+L* L%). This shows that 66% of semi-spontaneous questions have falling intonation. Of the read yes/no-questions, only about 7% of questions had falling contours, and the rest had final-rising intonation (48% L* H% and 46% L+H* H%).

It is possible that their read intonation shares more similarities with the 'typical Peninsular' rising intonation because they received education in Spanish and therefore, read more in Spanish. Although this was an exemplary study of a galaico-portuguese language, it leaves the question of how the data would look like with a higher number of participants and higher number of tokens in spontaneous speech.

2.4 Intonation of Yes/No-Questions in Galician Spanish

Rojo (2004) describes the Spanish that is spoken in Galicia as a consequence of transfer that has being ongoing for generations. Rojo hypothesizes that Galicians who learned Spanish as an L2 had transfer in their speech from their L1 and it remained present in their Spanish. This Spanish was passed on to future speakers who then suffered the same transfer without even having Galician as an L1 or main language of use. Therefore, although some younger Galicians may not use Galician habitually, they likely received input from someone who did use Galician habitually and have certain characteristics of Galician present in their Spanish that is not present in the rest of the Spanish varieties spoken across the Iberian Peninsula. Rojo (2004) is commonly cited in prosodic studies of Galician Spanish, but unfortunately, she does not mention intonation patterns specific to yes/no-questions. Castro (2003) concluded that there is prosodic transfer from Galician to Galician Spanish in certain sentence types such as *wh*-questions, but again, the intonation of yes/no-questions is not covered. This was also not an empirical study.

Hualde, Olarrea, Escobar and Travis (2009, p. 118) briefly mention how Galician Spanish has final-falling intonation for yes/no-questions. In Pérez Castillejo's (2012), there were 24 participants (10 women and 14 men) from La Coruña, Santiago y Vigo. Participants ranged from 18 to 64 years of age. An interview eliciting yes/no-questions in a less formal way than reading was used as a task. A total 1152 tokens of a combination of declarative statements and yes/no-questions were collected from participants during a reading task. Participants filled out a brief questionnaire indicating if they had received education in Galician and if their family spoke it at home. Results showed that the vast majority of participants preferred L* H% or L+H* HH% in the reading task. 19 out of the 24 participants used H%, L% and

HL% interchangeably in the semi-spontaneous speech task. This stylistic variation along with the tendency to use a rising intonation in the more formal reading task may indicate stigmatization of Galician features in Spanish and a contact-induced change. Fernandez Rei (2016) compared the speech of 22 female participants who were monolinguals of Galician and Spanish or bilinguals of these two languages and noted that yes/no-questions in Galicia Spanish descend starting at the last tonic syllable of the intonational phrase. Most varieties of Galician Spanish show H+L* L% contours for yes/no-questions, except for varieties found in the Rías Baixas area, which show the following circumflex contours: L+H* L%.

Fernandez Rei (2019) compared yes/no-questions in Galician and in Spanish from Galicia. 22 female participants were recruited for this study and produced a total of 57 tokens for this question type. Similar results from the 2016 study were found for Galician Spanish and were compared to yes/no-questions in Galician. Results showed that in Galician, just like in Spanish, there is a drastic fall in the last tonic syllable followed by a low boundary tone in the following syllable. Because the intonation patterns in Galician Spanish resemble the descending contour of Galician instead of the rising pattern characteristic of Madrid Spanish, she argues that there is prosodic transfer.

2.5 Intonational Transfer

Now that transfer and contact-induced change has been defined in Chapter one and intonation has been described in Chapter 2, previous literature on intonational transfer can be discussed. Several studies on prosody have shown that if two languages have a long history of contact, prosodic features of a language can be affected by another language. For example, Muntendam and Torreira (2016) examined prosodic features of declarative sentences with different focus structures in Peruvian Spanish and Quechua (and compared them to Peninsular Spanish). All 16 bilingual participants were either simultaneous bilinguals or early sequential bilinguals of Quechua and Spanish. Results showed a unidirectional influence. Intonation patterns from Quechua were transferred to Spanish, but no examples of Spanish contours were found in Quechua. Muntendam and Torreira's findings fall in line with other works on intonational transfer. Elordieta (2003) and Elordieta and Calleja (2005)

compared the prosodic features of Basque Spanish and Basque, another two languages which had a long history of contact. Results showed that Spanish intonation was present in Basque spoken by bilinguals

Romera and Elordieta (2013) acknowledge that most prosodic transfer occurs from the L1 to the L2, but in their 2013 study they examined prosodic accommodation of adult monolinguals of Spanish who arrived to Majorca. Here, L1 Spanish speakers spoke to L2 Spanish speakers (L1 Majorcan Catalan) in a semi-directed conversation. Results showed that transfer could take place even after a short period of exposure to intonation characteristics. The L1 Spanish speakers showed prosodic features of L2 Spanish speakers which came from their L1 Catalan.

Simonet (2011) investigated language contact in the same region, but he looked at utterance-final pitch accents in declaratives in Catalan and Spanish. Participants were early bilinguals and results showed that Catalan-Spanish bilinguals in Majorca tend to transfer intonation features from Catalan to Spanish.

Bullock (2009) recorded linguistic interviews with the last two speakers of Frenchville, Pennsylvania French. French was commonly spoken in this region from the mid-nineteenth century to the mid-twentieth century. The researcher compared the discourse with European French and found that prosodic characteristics of English were found in the French spoken by bilinguals in Frenchville, but not in France.

Prosodic studies in search of evidence of transfer have also been conducted in Galicia, Spain. As mentioned, Fernandez Rei's (2016) results show that speakers maintain Galician intonation in yes/no-questions in Spanish demonstrating transfer from Galician to Spanish. She emphasizes that Spanish of the region does not affect speakers' intonation in Galician, but instead Galician prosody influences Spanish prosody. However, perhaps different results could have been attained if language dominance of speakers had been measured, male participants had been analyzed and a wider age range had been present in the participants.

Similarly, Rodriguez Vazquez (2018) found that Galician intonation patterns of *wh*-questions in Spanish *wh*-questions. In this study there were 7 bilingual participants (4 women and 3 men) whose dominant language was Galician. A discourse completion task

was used to elicit 13 questions, which were repeated 3 times in each language. Results showed that there was direct transfer from Galician intonation to Spanish intonation.

Although Fernandez Rei (2016, 2019) and Rodriguez Vazquez (2018) offered contributions to what is known about Galician intonation in contact, more participants and a higher number of tokens is needed to draw the conclusion that there is no prosodic transfer from Spanish to Galician. Perez Castillejo (2012) is the only study until now to have recruited as many as 24 participants of both genders and have over 1,000 tokens. She looked at bilinguals' intonation of yes/no-questions in Galician Spanish and found four main contours: rising L+H* HH%, a different rising with a monotonal nuclear pitch accent L* HH% (the current thesis refers to this as alternate rising), falling H+L* L%, and circumflex L+H* HL%. Perez Castillejo's examples of rising contours in Spanish yes/no-questions indicate that rising patterns typical of other Peninsular varieties of Spanish can be observed in Galician Spanish even though Galician is known for its falling contours. Now, more information regarding bilinguals' speech in both Spanish and Galician are needed for comparison.

2.6 The Present Study

Overall, studies on Galician prosody have come a long way starting with impressionistic descriptions of the rising and falling Galician intonation patterns (Garcia Mouton, 1994; Regueira, 2000) to more empirical studies such as the ones cited in previous sections. All of these works, however, look at several sentence types (declaratives, wh- questions, statements, exclamations, etc.) resulting in a lower number of tokens per study for yes/no-questions. Additionally, little is known about the intonational tendencies of Spanish-Galician bilinguals taking into account gender, age, language use and proficiency in the two languages. Only one study in the past 20 years has included male participants (Perez Castillejo, 2012). Sobrino Perez (1999) suggests that there is a possibility that women tend to use a rising pattern more than men, but that more participants and a larger number of tokens need to be studied to determine this. In addition to requiring a more balanced comparison of gender, speakers from various age groups should also be compared considering the linguistic change in the region led by politics and new education standards implemented the past few decades.

In the current study, bilinguals produced yes/no questions in both Spanish and Galician. These questions were acoustically and statistically analyzed with regards to participants' age, gender and language dominance (based on BLP score).

The following are the research questions this study aims to answer along with the corresponding hypotheses:

1. What characteristics are shown in the intonation of Galician and Spanish in contact?

   Hypothesis 1: Based on the findings of Perez Castillejo (2012), it is hypothesized that Galician and Spanish yes/no-questions will show a variety of final-falling contours and final-rising contours.

2. Do bilinguals use similar or different intonation in Galician and Spanish?

   Hypothesis 2: Participants who are Galician-dominant will use final-falling contours in both languages and participants who are Spanish-dominant will use final-rising contours in both languages. This is based on results from Perez Castillejo's (2012) questionnaire which indicated that participants whose parent spoke to them in Spanish, were more likely to produce rising contours in yes/no-questions. Although this is different from a language dominance score provided with a BLP (which encompasses many aspects of bilingualism), it is the most relevant information in Galician Spanish intonation literature. Also, Perez Castillejo (2012) does not examine bilinguals' intonation in both Galician and Spanish (only Spanish), but if these were the results in previous studies for Galician Spanish, we hypothesize that it is the same for Galician.

3. Is there a preference for a certain intonation contour based on language dominance, gender and age?

   Hypothesis 3: According to Thomason and Kaufman (1988), factors such as these can affect borrowing that takes place between two languages in contact. It is hypothesized that language dominance will affect the speakers' preferences for a certain intonation contour. The more dominant a participant is in Spanish, the less likely he/she will produce falling contours in Galician. Male participants are more likely to produce falling contours (following Sobrino Perez, 1999) and older participants might be more likely to produce falling contours considering that older generations have higher proficiency rates of Galician (Instituto Galego de estatística, 2019).

CHAPTER 3

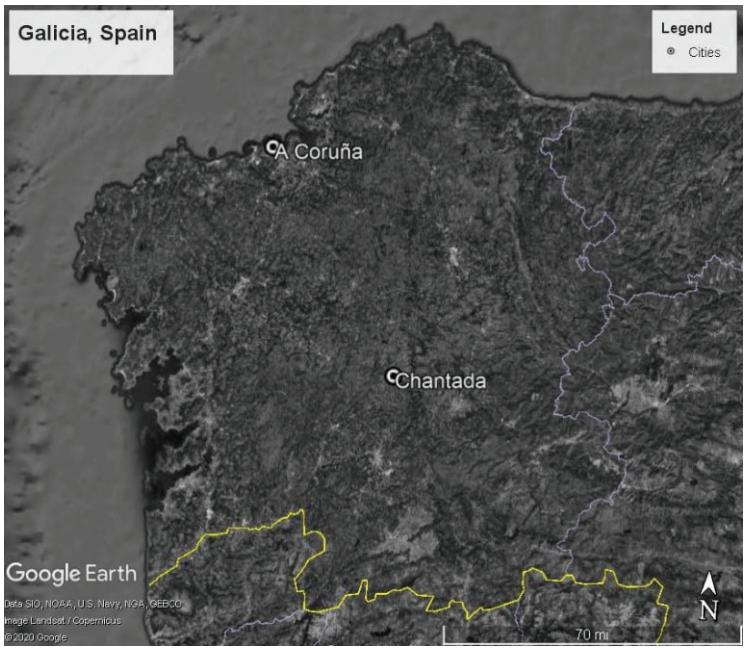
METHODOLOGY

This chapter outlines the methodology used to obtain intonation data for yes/no-questions produced by Galician-Spanish bilinguals in Spanish and Galician. It explains how the data were collected and analyzed for the current study. Section 3.1 summarizes participant information including whether they are simultaneous, early or late bilinguals, city of residence, Bilingual Language Profile scores, and education levels. Section 3.2 outlines the materials used for the study and explains the concept of the game used to elicit yes/no-questions, and section 3.3 discusses the procedures taken for the study. Finally, Section 3.4 reports how the data were analyzed acoustically and statistically.

3.1 Participants

Twenty adult Spanish-Galician bilinguals (10 males and 10 females) participated in the current study. Ages ranged between 21 and 62 years. For reasons explained in the analysis section, participant 14 had to be eliminated, leaving the study with nineteen participants with a mean age of 37.4 years. Ten participants were simultaneous bilinguals, three were early sequential bilinguals with Spanish as their L1, three were early sequential bilinguals with Galician as their L1, and three were late sequential bilinguals with Spanish as their L1. This information can be seen in Table 3.1.

Participants were recruited through the researcher's personal connections in Galicia as well as through the University of A Coruña. Some of the participants lived in small towns and commuted to A Coruña (the most populous city of Galicia) for their jobs, while others lived in the heart of the city. Other participants lived and worked in a rural village 157km southeast of A Coruña, Chantada. Figure 3.1 shows a map of Galicia with the two cities where recruitment took place.



"Galicia, Spain," by Google, Digital Globe, 2020
(https://www.google.com/earth/)

Figure 3.1: Map of Galicia

Participants filled out the Bilingual Language Profile (BLP) (Birdsong, Gertken & Amengual, 2012) in order to obtain a score of their language dominance based on self-evaluations of their language history, language use, language proficiencies and language attitudes. The full BLP questionanire can be found in Appendix B. Questions asked included the participants' education levels, years of education received in each language, attitudes towards each language, and language competency/preference for reading, listening, talking and writing. The responses were scored and added up to attain a global language score for each language. Then a language dominance score was calculated by subtracting the Galician global language score from the Spanish global language score. Dominance scores can range from -218 to +218. Scores closer to zero indicate that the participant is a balanced bilingual. The more negative a score, the more dominant the participant is in Galician and the more positive a score is, the more dominant the participant is in Spanish. Table 3.1 illustrates participant age, gender, BLP score, language dominance, education level and city of residence.

Table 3.1: Participant Demographics

Participant	**Age**	**Gender M/F**	**Bilingual Type**	**BLP Score**	**Dominant Language**	**Education**	**City of Residence**
1	26	M	Early Sequential (L1 Span.)	82.01	Spanish	Univ.	A Coruña
3	37	M	Simultaneous	46.96	Spanish	Some Univ.	A Coruña
4	21	M	Simultaneous	79.56	Spanish	Some Univ.	A Coruña
6	52	F	Late Sequential (L1 Span.)	58.48	Spanish	Some Master's	Chantada
7	43	M	Simultaneous	42.32	Spanish	High School	A Coruña
9	27	F	Early Sequential (L1 Span.)	136.31	Spanish	Master's	A Coruña
10	62	F	Early Sequential (L1 Gal.)	13.17	Spanish	Univ.	Chantada
16	59	F	Late Sequential (L1 Span.)	82.55	Spanish	Univ.	A Coruña
18	26	F	Early Sequential (L1 Span.)	113.97	Spanish	Master's	A Coruña
19	24	M	Simultaneous	81.74	Spanish	Univ.	A Coruña
2	48	F	Early Sequential (L1 Gal.)	117.42	Galician	Univ.	Chantada
5	29	F	Simultaneous	-59.22	Galician	Univ.	A Coruña
8	27	M	Simultaneous	-10.9	Galician	Master's	A Coruña
11	50	F	Early Sequential (L1 Gal.)	-41.06	Galician	High School	Chantada
12	44	M	Simultaneous	-34.79	Galician	Univ.	A Coruña
13	31	F	Simultaneous	-10.9	Galician	Master's	A Coruña
15	23	M	Simultaneous	-67.12	Galician	Univ.	A Coruña
17	58	F	Late Sequential (L1 Span.)	-33.7	Galician	Univ.	Chantada
20	23	M	Simultaneous	-81.46	Galician	Univ.	A Coruña

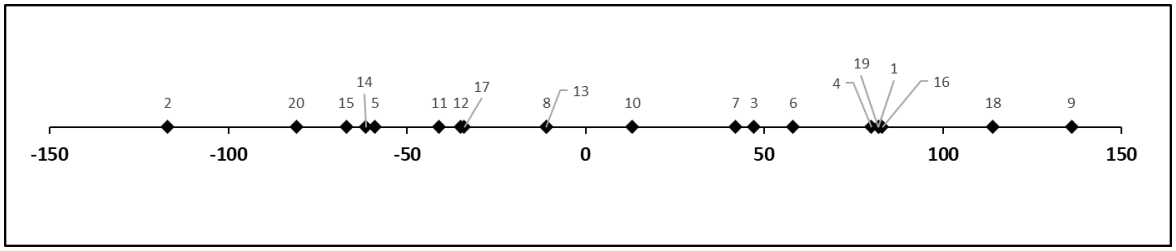


Figure 3.2: Participant BLP Scores

Figure 3.2 illustrates BLP scores on the horizontal axis and participants' BLP scores are plotted along the axis with their participant numbers over their plotted points. It can be observed that 10 participants were Galician-dominant and 10 were Spanish-dominant. Considering that BLP scores can range from -218 to +218, but the figure shows that none of these participants have scores above +/- 150. The most balanced bilinguals found closest to the zero point are participants 8, 13 and 10. The scores are distributed relatively evenly with the exception of one small cluster on the Spanish-dominant (right) side at around 80.

3.2 Materials

The task used for the current study was based on the one in Muntendam and Torreira (2016) and was designed to elicit yes/no-questions of varying lengths (3-4 words), as well as declaratives and *wh*-questions. The discussion here is limited to yes/no-questions.

In this task, each participant received a stack of cards (pertaining to either participant A or participant B) with different colored objects with either a picture and interrogation mark or just a picture or color. Participants played the game in pairs and both of them asked and answered the same questions, so that the same data were collected from everyone. The images on the cards elicited either an information-seeking yes/no-question or a statement. Participants were randomly assigned to be either participant A or participant B. Whenever participant A asked if participant B had the image in his/her interrogation picture card, participant B would have to answer yes or no based on which answer card he/she had. Cards that elicited questions had interrogation marks on them and the answer cards were

just of a colored or colorless image. All cards were organized in an order so that there would be a question card followed by an answer card. The game was played in the same order every time and all questions were asked in the same order across participants who played as participant A and those who played as participant B. A full list of yes/no-questions elicited in this game can be found in Appendix A. All images used for the cards were freely licensed photos labeled for reuse and modification.

Examples 1-3 are examples of the questions elicited and figures 3.3-3.8 are the images that appeared on the cards. Game cards used to elicit a yes/no-question with three words could either have a noun, as seen in example 1 or an adjective, as seen in example 2. Cards that elicited four word yes/no-questions included a noun and an adjective as in example 3.

Example 1

a. *¿Tienes una nube?/ Tes una nube?*
have-prs.2sg a cloud
'Do you have a cloud?'

Figure 3.3: Sample Question 1

b. *Sí. Tengo una nube amarilla.*
yes have-prs.1sg a cloud yellow
'Yes. I have a yellow cloud.

Figure 3.4: Sample Answer 1

Example 2

a. *¿Tienes algo verde?/ Tes algo verde?*
have-prs.2sg something green
'Do you have something green?'

Figure 3.5: Sample Question 2

Example 2

b. *Sí. Tengo una lámpara verde./*
Sí. teño una lámpada verde.
yes have-prs.1sg a lamp green
'Yes. I have a green lamp.'

Figure 3.6: Sample Answer 2

Example 3

a. *¿Tienes un árbol rojo?/*
Tes una árbore vermello?
have-prs.2sg a tree red?
'Do you have a red tree?'

Figure 3.7: Sample Question 3

b. *No. Tengo un árbol verde./*
No. Teño una árbore verde.
no have-prs.1sg tree green
'No. I have a green tree.'

Figure 3.8: Sample Answer 3

Participants were also provided an object sheet to mark off the responses their partner gave. Two cardboard folders served as dividers during the game and were placed between the participants so that they did not see their partner's cards. The entire object sheet given to the participants can be found in Appendix A.

The target items used in the game were chosen taking into consideration the voicing of the consonants of the words they represented in both Spanish and Galician in order to create an optimal environment for acoustic analysis. During the design of the materials, voiceless consonants were avoided as much as possible in order to capture unbroken pitch contours. The location of stress was also taken into account. Specifically, sentence final words had either antepenultimate or penultimate stress in order to obtain a clear picture of both the nuclear pitch accent and the final boundary tone. Another consideration for the target

items during the question design process was imageability. The target word could have been completely voiced throughout, but if there was no way to show an easy to interpret picture for the word in the game, it could not be used.

Twenty target items and four colors were used in the design of the materials to produce 80 yes/no-questions. Colorless images required the participant to just ask if their partner had the image pictured in the card.

In the design of the task, distractor questions were placed between similar questions so that participant B did not ask the same question immediately after participant A had asked that question. This was done to make sure that participant A's question (or answer) would not influence participant B's questions or answer. For example, cases were avoided where participants could ask *¿y tú?* 'and you?' or respond *yo también* 'me too'.

The game elicited a total of 80 yes/no-questions (20 questions with just a noun, 20 questions with just an adjective, 40 questions with a noun and an adjective) from each participant in each language. There were also 30 distractors.

3.3 Procedure

Once the participants arrived in pairs to the place of recording, they completed the BLP and were then given instructions on how to play the card game. Participants knew their partner and were not randomly assigned one, allowing for them to be more comfortable during the execution of the task. Once the instructions were given, a practice game with non-target items was used to introduce participants to the setup of the game and ensure that they understood how to play the game. All participants were given an object sheet to mark off their partner's objects in the actual game. Both the target phrases and the distractors were on the sheet, but not the fillers or the objects used in the practice game.

In the game, the participants were recorded while taking turns asking and answering questions as they flipped through the cards in order. By the end of the game, each participant had asked and answered the same questions. These questions were randomized so that participants did not expect to repeat the same questions that their partners had asked

them. As they played the game, they had to cross out objects from a sheet so that they could keep track of what objects their partners already mentioned that they had. The winner of the game was the participant who first filled out the entire object sheet. This distracted the participants from the actual purpose of the experiment.

The card game was completed once in Spanish and a second time in Galician. Participants chose which language to start the game in so that they would feel more comfortable starting this new task. Six pairs chose to start in Galician and four pairs chose to start in Spanish. Each pair of participants completed the task in both languages in one session, which lasted approximately an hour. A ten-minute break was given between games.

Tokens were collected in ten sessions (one session per pair). Participants played the game in the following pairs: participant 10 and participant 17 (game 1 in Galician), participant 2 and participant 11 (game 1 in Galician), participant 6 and participant 14 (game 1 in Galician), participant 5 and participant 13 (game 1 in Galician), participant 3 and participant 7 (game 1 in Spanish), participant 8 and participant 12 (game 1 in Galician), participant 15 and participant 20 (game 1 in Galician), participant 18 and participant 19 (game 1 in Spanish), participant 4 and participant 16 (game 1 in Spanish), and finally, participant 1 and participant9 (game 1 in Spanish).

All recordings took place in a quiet room in A Coruña or Chantada with a Zoom H4N Pro Digital Multitrack recorder set at 44Hz in mono. After the completion of the two tasks, participants were paid for their participation.

3.4 Data Analysis

All recordings were first segmented into individual question files and were then annotated and analyzed using *Praat* (Boersma and Weenink, 2018). Recordings with hesitations or code-switching were discarded, as were utterances with sentence-final devoicing because they did not display pitch tracking. During this process, participant 14 had to be eliminated due to devoicing the last syllable of every utterance which made it impossible to accurately analyze his intonation. This resulted in the inclusion of 19 participants (9 male participants and 10 female participants) in the study.

As previously mentioned, target items were designed taking into consideration the voicing of the consonants in the words they represented. However, due to lexical variation across Galician varieties, not all words used in the game coincided with the normative Galician the game was planned around. For example, some speakers used the normative *vermello* for 'red' while others used *roxo.* In this case, the fricative [ʃ] in roxo makes the last syllable of the utterance voiceless. If the fricative affected the sonority of the utterance's target regions, the token was discarded.

In other cases, participants sometimes used different nouns for the pictures than the ones which were intended, but as long as the yes/no-question made sense and the pitch was still visible, the tokens were kept. For example, sometimes participants would ask *Tes una pita negra?* 'Do you have a black chicken?' because that is the word for chicken in their variety of Galician instead of the normative way which is galiña. Regardless, the voiceless plosive in pita in this context does not affect the target region of the question. It was when participants sometimes misinterpreted the questions to be wh-questions that they had to be eliminated. For example, instead of asking *Tes algo amarillo?* 'Do you have something yellow?' in Galician, they would ask *Que tes amarelo?* 'What do you have that is yellow?'.

The game was designed to have participants produce 80 questions in Spanish and 80 in Galician (160 in both languages together), totaling to 3,040 yes/no-questions uttered by 19 participants. 487 questions had to be discarded (12.5% of Spanish tokens and 19.5% Galician tokens) due to noise and/or hesitations. 2,553 is the total number of yes/no-questions that were acoustically analyzed for this study (1,330 in Spanish and 1,223 in Galician).

Sound files were annotated using the Spanish ToBI annotating conventions in Praat. First, a textgrid was created for each sound file and four tiers were created in each textgrid: one for utterances, one for syllables, one for the contour and one for notes. Since I specifically looked at nuclear pitch accent and the boundary tone, only the necessary syllables were annotated. The target words had either penultimate or antepenultimate stress so only the last two or three syllables in question were marked. Nuclear pitch accents corresponded to the last stressed syllable in the intonational phrase and boundary tones corresponded to the last syllable in the intonational phrase. For example, Figure 3.10 shows the annotation of

the question: *Tes un xeado verde?* 'Do you have a green ice-cream?'[1]. Here, the nuclear pitch accent is the syllable [ver] and the boundary tone is the syllable [de]. The contour in the nuclear pitch accent shows that tone starts out high and then falls within the syllable so it is annotated as H+L* and the boundary tone shows a low tone, so it is annotated as L%.

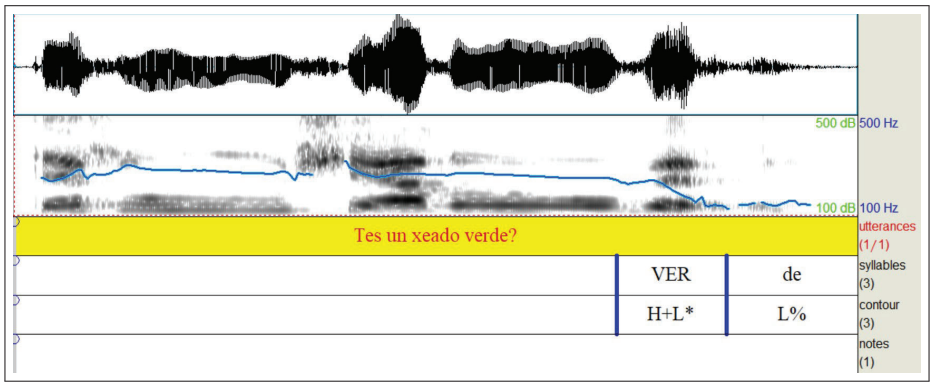


Figure 3.9: Annotation Example

Pitch settings were changed for each participant. For males, pitch settings were usually set from 75Hz to 200Hz and for women, they were usually set from 100Hz to 500Hz. Figure ten shows a token from a female participant (participant 2) as can be seen through the pitch settings to the right of the spectrogram. While determining the contours for each relevant syllable, a minimum difference of 7 Hz was used to determine a rise or a fall. This can be seen in the nuclear pitch accent in Figure 3.10 which is H+L* because the low tone was much lower than the beginning and the difference was more than 7Hz from the syllable's initial frequency. Cases that were unclear were discussed with two other researchers and if no agreement was reached, the token was discarded.

An excel spreadsheet was created including acoustic information from participants' sound files (nuclear pitch accents, boundary tones, and the nuclear configuration combining the two) along with their age, gender, and BLP score.

[1]The syllable tier is transcribed orthographically and the stressed syllable is indicated in all caps.

For the statistical analysis, χ^2 analyses were used to isolate independent variables and determine if they had a statistical main effect on the dependent variable[2] . BLP scores and age were divided into groups. BLP scores were divided into Galician-dominant (negative scores) and Spanish-dominant (positive scores) groups. Age was divided into younger (21-48 years old) and older (50-62 years old) groups. The number of configurations produced by participants will be discussed in the following chapter, but as these were many, this variable was also further grouped to include the top three most common nuclear configurations as separate groups and another group labeled as 'other' which contained the less frequent configurations.

Chi-squares were run to determine whether age (younger vs. older), gender (male vs. female), and language dominance (Spanish-dominant vs. Galician-dominant) had an effect on the nuclear configurations produced. This was done once for the Spanish data and once for Galician data. Also tested was whether Language (Spanish vs. Galician) had a significant effect on some configurations being produced more in one language over the other. Finally, nuclear configurations that each participant used in Spanish vs. Galician were analyzed to determine whether participants used the same or different intonation patterns in their two languages. The next chapter provides the results of the tasks in Spanish and Galician.

[2]A multinomial regression would have been an ideal statistical analysis to run so that continuous variables such as BLP scores and age did not have to be categorized, but due to missing data points and not meeting the goodness of fit assumption, this statistical analysis was unsuccessful.

CHAPTER 4

RESULTS

This chapter discusses the findings of the yes/no question elicitation game in Galician and in Spanish. The general results from the Spanish game are discussed in Section 4.1 along with the effects of gender, age and language dominance on intonation patterns produced. The general results from the Galician game are discussed in Section 4.2 along with the effects of age, gender and language dominance on intonation patterns produced. Section 4.3 focuses on the contours used in Spanish versus in Galician, and discusses individual results while connecting them to participants age, gender and language dominance. Finally, Section 4.4 summarizes the results.

4.1 Contours Produced in Spanish Yes/No-Questions

A total of 1,330 Spanish yes/no-questions were analyzed acoustically and statistically. Participants produced a total of thirteen different nuclear configurations, but three were the most prevalent in the data: Rising L+H* HH% accounted for 48% of the tokens (633 yes/no-questions), falling H+L* L% accounted for 26% of the data (348 yes/no-questions), and alternate rising L* HH% accounted for 14% of the data (190 yes/no-questions). Only 11% of the data (148 yes/no-questions) were produced with nuclear configurations that were not one of the main three contours. These uncommon contours were: H+L* HH%, H+L* HL%, H+L* LH%, L* HL%, L* L%, L* LH%, L+>H* L%, L+H* HL%, L+H* L% and L+H* LH%.

Figures 4.1, 4.2 and 4.3 show examples of the three most common contours produced in Spanish yes/no-questions and the following descriptions refer to the pitch movements in the final region of the sentence. Figure 4.1 shows a pitch contour which started with a low tone which rose to a high tone within the last stressed syllable and ended in a high boundary tone (L+H* HH%). Figure 4.2 shows a pitch contour that started with a high tone which

fell to a low tone within the last stressed syllable of the utterance and was followed by a low boundary tone (H+L* L%). Figure 4.3 shows a contour with a low tone throughout the stressed syllable of the first nuclear word and then a rise in the boundary tone (L* HH%).

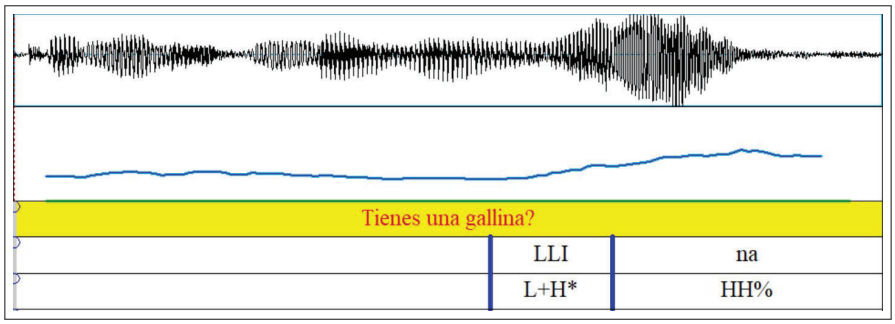


Figure 4.1: Rising L+H* HH% Contour in Spanish

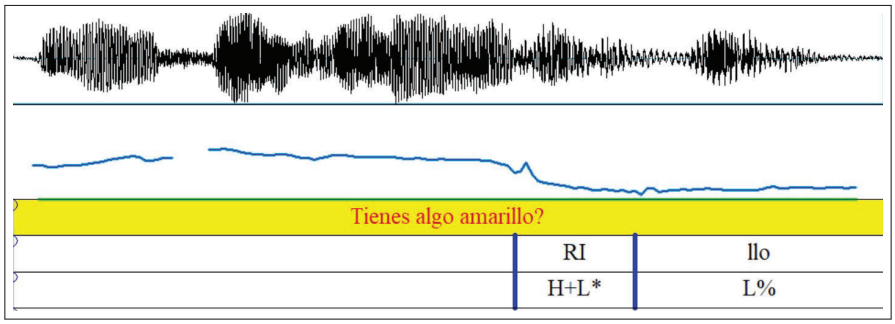


Figure 4.2: Falling H+L* L% Contour in Spanish

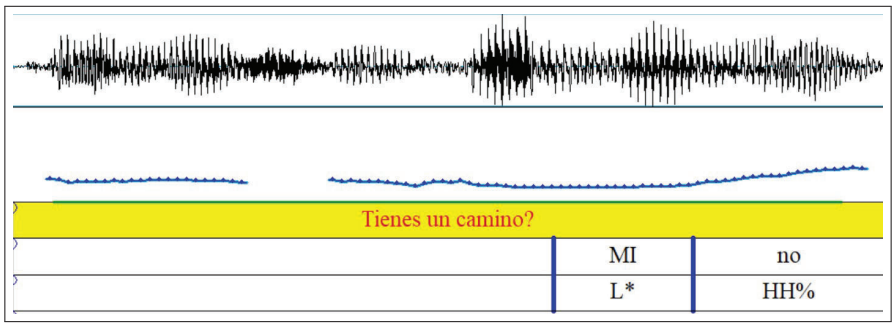


Figure 4.3: Alternate Rising L* HH% Contour in Spanish

Figure 4.4 illustrates the percentages of all nuclear configurations produced in Spanish yes/no-questions. If nuclear configurations are separated by rising and falling boundary tones, about 67% of the data (890/1330 tokens) showed rising contours and 33% of the data (440/1330 tokens) showed falling contours. In general, results showed a preference for the use of rising contours over falling contours in yes/no-questions in Galician Spanish.

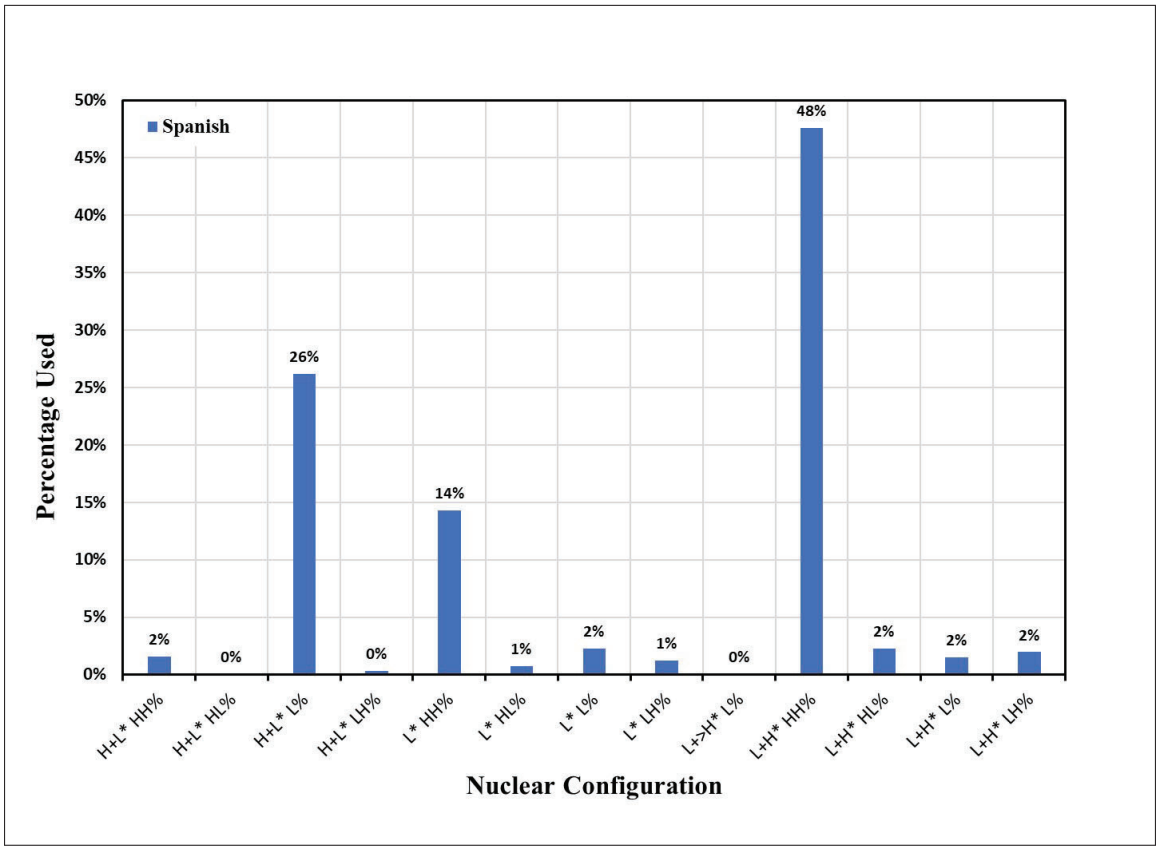


Figure 4.4: Distribution of Nuclear Configurations in Spanish Yes/No-Questions

No participant produced a nuclear configuration under the 'other' category as their most frequent intonation contour for Spanish yes/no-questions. Therefore, Figure 4.5 only features the 3 most common nuclear configurations: L+H* HH%, L* HH%, H+L* L%. The x-axis of the graph displays participants' BLP scores and the y-axis shows the percentage of participants' most frequent nuclear configuration. Recall that negative scores indicate that the participant was dominant in Galician, whereas positive scores indicate that the partici-

pant was dominant in Spanish. The figure shows that most Spanish-dominant participants preferred L+H* HH%. Galician-dominant participants showed more mixed results.

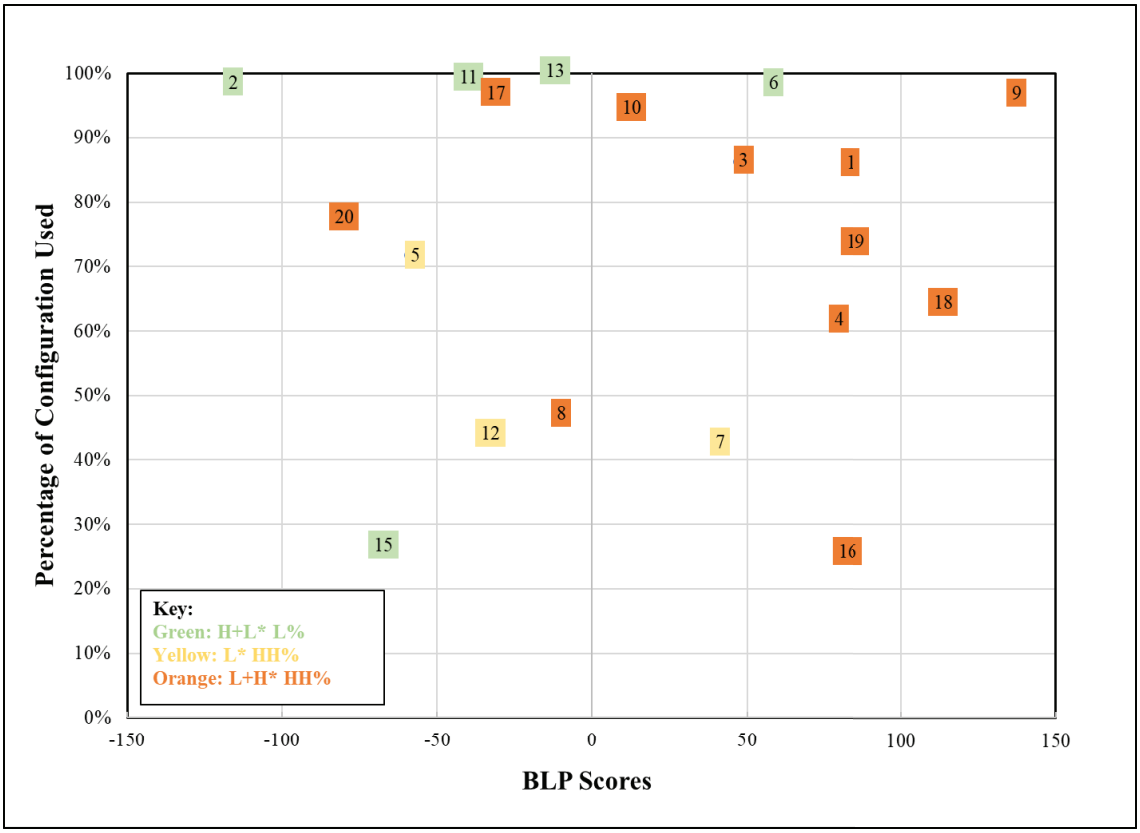


Figure 4.5: Most Common Nuclear Configurations for Spanish Yes/No-Questions

4.1.1 Effects of Age, Gender and Language Dominance on Contours Used in Spanish

A Chi-square test was performed to examine the relation between nuclear configurations and age. As mentioned in the methodology, participants were divided into two age groups: younger (21-48 years old) and older (50-62 years old). The two age groups differed significantly in their use of nuclear configurations χ^2 (4, N = 1330) = 122.4, $p < 0.001$. Older participants tended to use falling H+L* L% and younger participants tended to use rising L+H* HH%. The most common nuclear configuration for Spanish, rising L+H* HH%, was produced much more by the younger group (ages 21-48) (67%) than by the older group (ages

50-62) (33%). The second most common nuclear configuration for Spanish yes/no-questions was H+L* L%. The older group used this nuclear configuration much more often than the younger group. The older group produced 68% of the H+L* L% contours in the data, whereas the younger group produced 32% of it. The third most common contour was L* HH%. Results show that the younger group produced 56% of the L* HH% contours and the older group produced 44% of them (see Table 4.1).

Table 4.1: Nuclear Configurations Produced in Spanish Yes/No Questions by Age

Nuclear	**Younger Group**		**Older Group**		**Total**	
Configuration	[N]	[%]	[N]	[%]	[N]	[%]
L+H*HH%	424	67	209	33	633	100
H+L*L%	112	32	236	68	348	100
L*HH%	107	56	83	44	190	100
Other	107	67	52	33	159	100

An additional Chi-square test was performed to examine the relation between nuclear configurations and gender. The two genders differed significantly in their use of nuclear configurations χ^2 (4, N = 1330) = 303, $p < 0.001$. Men used mostly rising contours: they produced 59% of all alternate rising L* HH% configurations and 56% of all rising L+H* HH% configurations. Women produced mostly a falling H+L* L% contour; 92% of all falling H+L* L% contours were produced by women (see Table 4.2).

Table 4.2: Nuclear Configurations Produced in Spanish Yes/No Questions by Gender

Nuclear	**Female**		**Male**		**Total**	
Configuration	[N]	[%]	[N]	[%]	[N]	[%]
L+H*HH%	277	44	356	56	633	100
H+L*L%	319	92	29	8	348	100
L*HH%	78	41	112	59	190	100
Other	35	22	124	78	159	100

Finally a third Chi-square test was performed to examine the relation between nuclear configurations and language dominance. Language dominance was divided into two groups: Galician-dominant (negative BLP scores) and Spanish-dominant (positive BLP scores). The

two language dominance groups differed significantly in their use of nuclear configurations χ^2 (4, N = 1330) = 183.2, $p < 0.001$. 69% of rising L+H* HH% contours were produced by Spanish-dominant bilinguals. 73% of falling H+L* L% contours were produced by Galician-dominant bilinguals. 67% of alternate rising L* HH% contours were produced by Galician-dominant bilinguals (see Table 4.3).

Table 4.3: Nuclear Configurations Produced in Spanish Yes/No Questions by Language Dominance

Nuclear	**Galician-Dominant**		**Spanish-Dominant**		**Total**	
Configuration	[N]	[%]	[N]	[%]	[N]	[%]
L+H*HH%	199	31	434	69	633	100
H+L*L%	254	73	94	27	348	100
L*HH%	127	67	63	33	190	100
Other	78	49	81	51	159	100

Overall, in Galician Spanish, rising L+H* HH% was the most common nuclear configuration, followed by falling H+L* L% and alternate rising L* HH%. Older participants, Galician-dominant participants, and women were the participants who produced the most falling H+L* L% contours. Younger and Spanish-dominant participants were the ones more likely to produce rising L+H* HH% contour. The alternate rising pattern, L* HH% was produced slightly more by the younger participants, slightly more by men, and more by Galician-dominant participants.

4.2 Contours Produced in Galician Yes/No-Questions

A total of 1,223 Galician yes/no-questions were analyzed acoustically and statistically. The same three nuclear configurations that were most common in Spanish were also the most common in Galician yes/no-questions. The rising L+H* HH% nuclear configuration was produced in 44% of the data (537 yes/no-questions), falling H+L* L% was produced in 36% of the data (437 yes/no-questions), and alternate rising L* HH% was produced in 9% of the data (104 yes/no-questions). The uncommon nuclear configurations that were grouped together as 'other' accounted for 12% of the data (145 yes/no-questions). These uncommon

contours were: H+L* HH%, H+L* HL%, H+L* LH%, L* HL%, L* L%, L* LH%, L+H* HL%, L+H* L% and L+H* LH%.

Although, rising L+H* HH% was the most common configuration in Galician yes/no-questions (as it was in Spanish), more falling H+L* L% examples can be seen in Galician yes/no-questions than in Spanish yes/no-questions and the following descriptions refer to the pitch movements in the final region of the sentence. Figures 4.6, 4.7 and 4.8 show examples of the three main contours used in Galician. Figure 4.6 shows a pitch contour pitch that starts with a low tone which rises within the stressed syllable of the final word and ends in a high boundary tone (L+H* HH%). Figure 4.7 shows a pitch contour that starts with a high tone which falls within the stressed syllable and is followed by a low boundary tone (H+L* L%). Figure 4.8 shows a low tone throughout the stressed syllable of the final word and then a rise in the boundary tone (L* HH%).

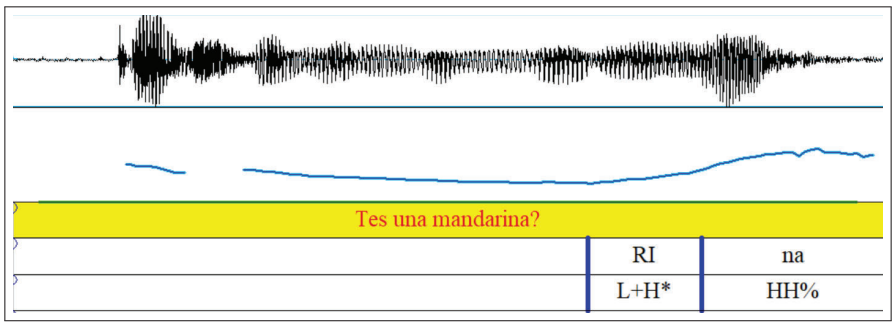


Figure 4.6: Rising L+H* HH% Contour in Galician

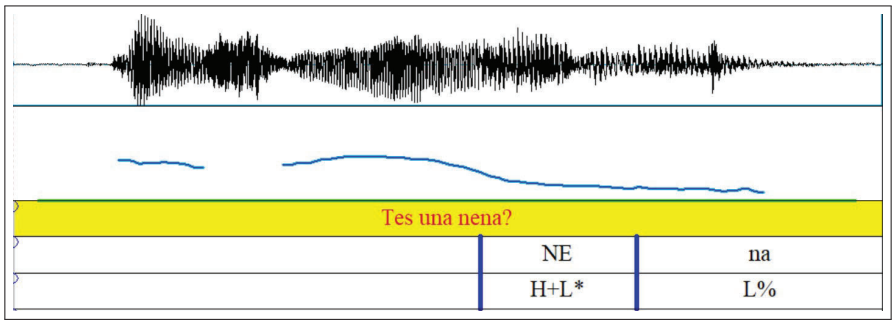


Figure 4.7: Falling H+L* L% Contour in Galician

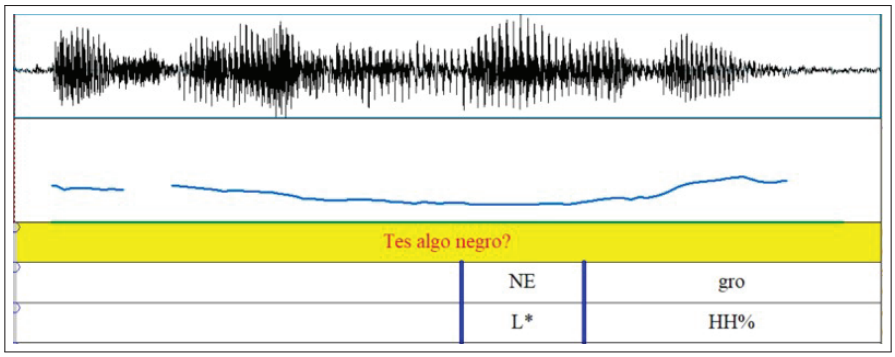


Figure 4.8: Alternate Rising L* HH% Contour in Galician

Figure 4.9 illustrates the percentages of all nuclear configurations produced in Galician yes/no-questions. If all nuclear configurations are separated by rising versus falling boundary tones, data showed that about 43% of yes/no-questions (531 tokens) were produced with final-falling contours and about 57% of the data (691 tokens) were produced with final-rising contours . Therefore, just considering the results of boundary tones, descending contours occurred almost as frequently as rising contours in Galician yes/no-questions.

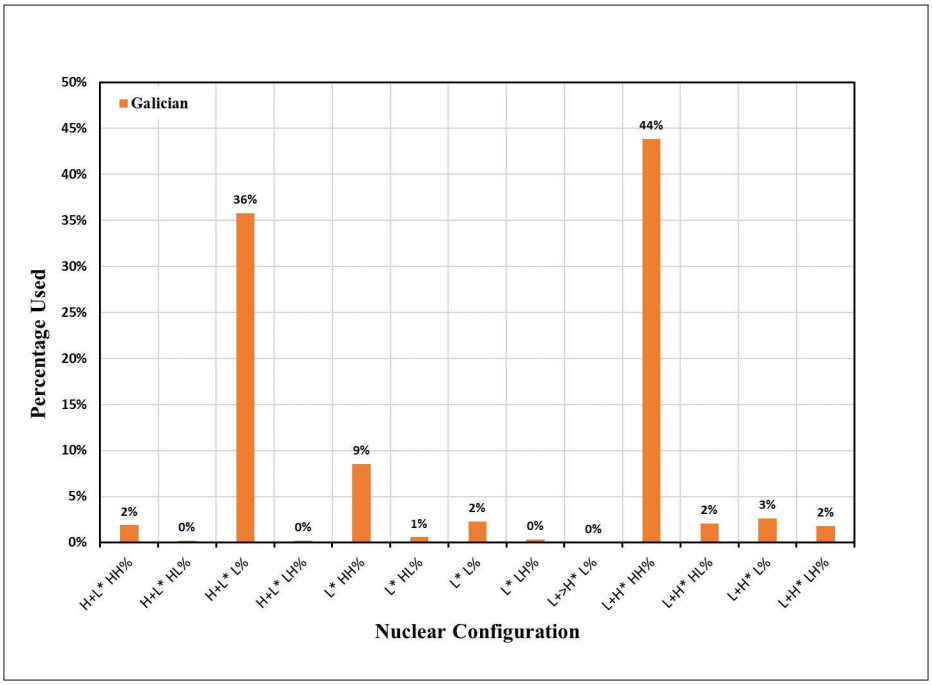


Figure 4.9: Distribution of Nuclear Configurations in Galician Yes/No-Questions

Figure 4.10 illustrates which contour each participant used the most in Galician. No participant produced a nuclear configuration under the 'other' category as their most frequent intonation contour for Galician yes/no-questions, nor was the alternate rising pattern L* HH% a preferred configuration for any participant. The only two configurations participants used as their most frequent nuclear configurations were rising L+H* HH% and falling H+L* L%. Therefore, Figure 4.10 only features the 2 most common nuclear configurations: rising L+H* HH% and falling H+L* L%. The x-axis features the participants' BLP score (negative score = Galician-dominant; positive score = Spanish-dominant) and the y-axis features the percentage the participant's preferred nuclear configuration was used.

Seven out of ten Spanish-dominant participants produced rising L+H* HH% and six out of nine Galician-dominant participants falling H+L* L% for yes/no-questions in Galician. Three Galician-dominant participants rising L+H* HH% as their preferred nuclear configuration and three Spanish-dominant participants falling H+L* L% as their preferred nuclear configuration.

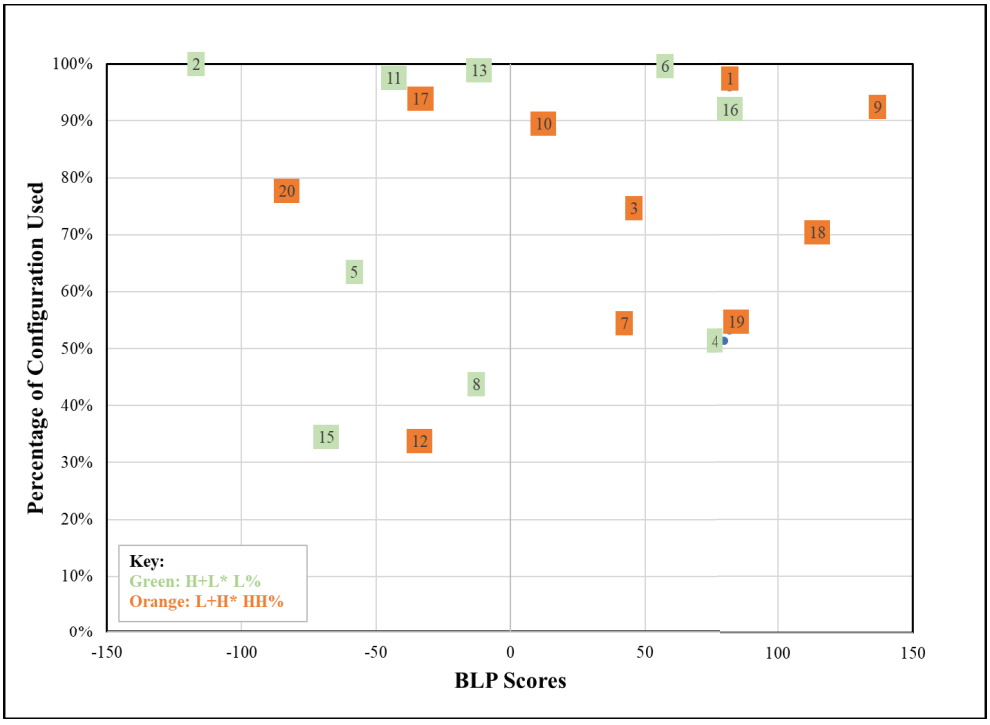


Figure 4.10: Bilinguals' Preferred Nuclear Configuration in Galician Yes/No-Questions

4.2.1 Effects of Age, Gender and Language Dominance on Contours Used in Galician

A Chi-square test was performed to examine the relation between nuclear configurations and age. As mentioned in the methodology, participants were divided into two age groups: younger (21-48 years old) and older (50-62 years old). The two age groups differed significantly in their use of nuclear configurations χ^2 (3, N = 1223) = 56.2, $p < 0.001$. The younger group 63.5% of the rising L+H* HH% pattern. Conversely, the older group 57% of all falling H+L* L% configurations in Galician. In addition to producing the majority of L+H* HH% contours, the younger group also produced 71% of all L* HH% patterns in Galician yes/no-questions. Therefore, younger bilinguals have a tendency to produce rising patterns: either L* HH% or L+H* HH% (see Table 4).

Table 4.4: Nuclear Configurations Produced in Galician Yes/No Questions by Age

Nuclear	**Younger Group**		**Older Group**		**Total**	
Configuration	[N]	[%]	[N]	[%]	[N]	[%]
L+H*HH%	341	64	196	37	537	100
H+L*L%	188	43	249	57	437	100
L*HH%	74	71	30	29	104	100
Other	94	65	51	35	145	100

Another Chi-square test was performed to examine the relation between nuclear configurations and gender. The two genders differed significantly in their use of nuclear configurations χ^2 (3, N = 1223) = 237.5, $p < 0.001$. Men produced 57% of the total rising L+H* HH% configurations while women produced 81% of the total falling H+L* L% contours. Men also produced the majority of the alternate rising L* HH% configurations produced in Galician (71%). Therefore, men produced most of the rising patterns (either L+H* HH% or L* HH%) whereas women produced most of the falling H+L* L% patterns (see Table 4.5).

Table 4.5: Nuclear Configurations Produced in Galician Yes/No Questions by Gender

Nuclear	**Female**		**Male**		**Total**	
Configuration	[N]	[%]	[N]	[%]	[N]	[%]
L+H*HH%	233	43	304	57	537	100
H+L*L%	355	81	82	19	437	100
L*HH%	30	29	74	71	104	100
Other	33	23	112	77	145	100

Finally, a Chi-square test was performed to examine the relation between nuclear configurations and language dominance. Language dominance was separated as Galician-dominant (negative BLP scores) and Spanish-dominant (positive BLP scores). The two language dominance groups differed significantly in their use of nuclear configurations χ^2 (3, N = 1223) = 165, $p < 0.001$. Spanish-dominant participants produced 70% of the rising peninsular pattern, L+H* HH%. Conversely, Galician-dominant participants produced 68% of the falling H+L* L% configuration. The Galician-dominant participants also produced 71% of the alternate rising pattern L* HH% (see Table 4.6).

Table 4.6: Nuclear Configurations Produced in Galician Yes/No Questions by Language Dominance

Nuclear	**Galician-Dominant**		**Spanish-Dominant**		**Total**	
Configuration	[N]	[%]	[N]	[%]	[N]	[%]
L+H*HH%	162	30	375	70	537	100
H+L*L%	298	68	139	32	437	100
L*HH%	74	71	30	29	104	100
Other	35	22	124	78	145	100

Similar to the Spanish results, in Galician, women tended to produce falling H+L* L% contours and men produced the highest percentage of alternate rising L* HH%. This alternate rising pattern was more common among younger and Galician-dominant speakers. The rising L+H* HH% pattern is more common for younger and Spanish-dominant participants.

4.3 Intonation of Yes/No-Questions in Spanish versus Galician

Results showed that rising L+H* HH% was the most commonly produced nuclear configuration in both Spanish and Galician. Falling H+L* L% appeared more frequently in Galician than in Spanish and the alternate rising L* HH% occurred more times in Spanish than in Galician. Figure 4.11 compares the frequency of the nuclear configurations across both languages. Several other contours were present in both languages but none of these were used for more than 3% of the language's data.

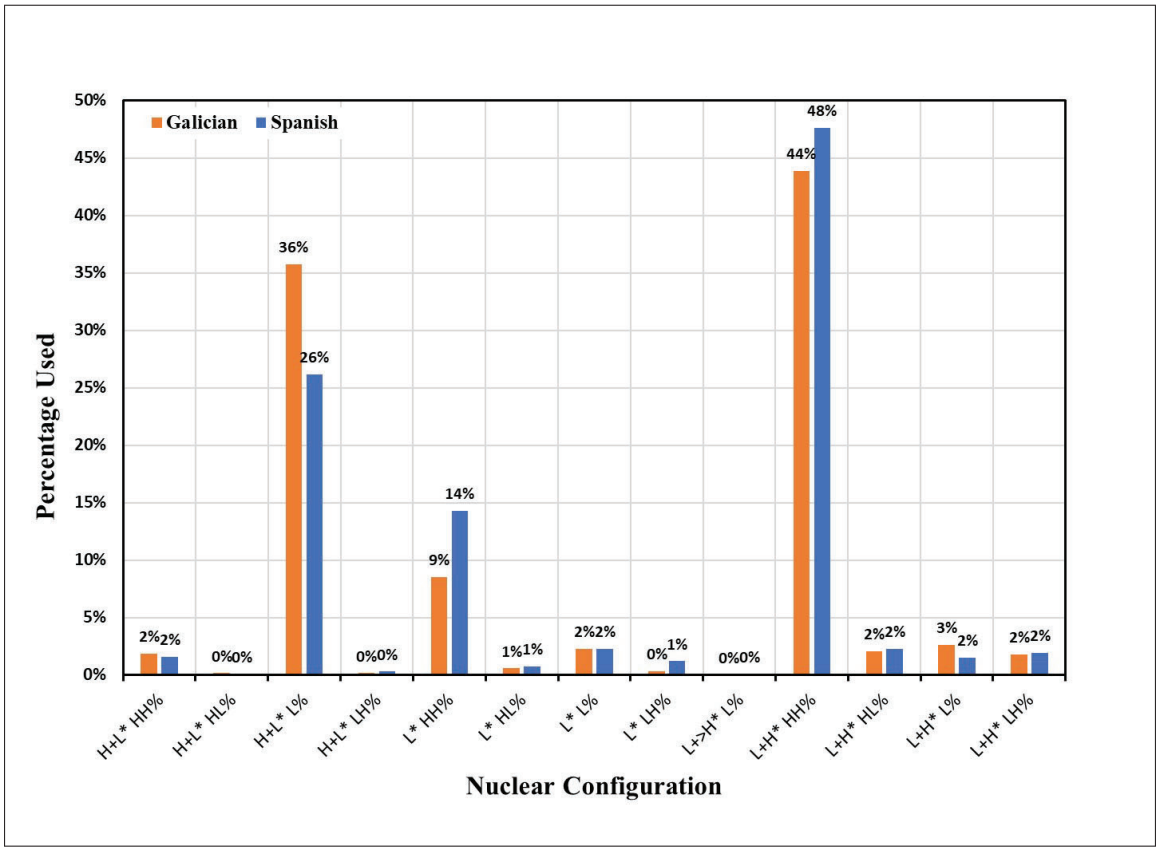


Figure 4.11: Distributions of Nuclear Configurations Across Spanish and Galician

4.3.1 Significant Effects for Nuclear Configurations and Language

A Chi-square test was performed to examine the relation between nuclear configurations and language. The test showed that the two languages differed significantly in their use of nuclear configurations χ^2 (3, N = 2553) = 39.4, $p < 0.001$. 54% of all L+H* HH% contours were produced in Spanish while 46% of these were produced in Galician. 56% of all falling H+L* L% contours were produced in Galician while 44% of these were produced in Spanish (see Table 4.7). The alternative rising contour L* HH% was produced mostly in Spanish (65%), while only 35% of these were produced in Galician. In sum, both falling H+L* L% and rising L+H* HH% commonly appeared in both languages, but the alternative rising contour L* HH% appeared mostly in Spanish.

Table 4.7: Nuclear Configurations Produced by Language

Nuclear	**Galician**		**Spanish**		**Total**	
Configuration	[N]	[%]	[N]	[%]	[N]	[%]
L+H*HH%	537	46	633	54	1170	100
H+L*L%	437	56	348	44	785	100
L*HH%	104	35	190	65	294	100
Other	145	48	159	52	304	100

4.3.2 Individual Results in Spanish

Table 4.8 illustrates the percentage of times each participant used the main three nuclear configurations and the 'other' configuration group in both languages. Eleven participants produced rising L+H* HH% as their preferred contour for yes/no-questions in Spanish, three participants produced alternate rising L* HH%, and five participants produced falling H+L* L%. Rates at which preferred intonation patterns were produced varied greatly though. In other words, some participants, like participant 11 produced their preferred contour for 100% of Spanish yes/no-questions while other participants, like participant 7, produced their preferred contour for 42% of Spanish yes/no-questions. This means that participants like participant 7 showed greater intonational variation.

Seven participants used a specific contour for over 90% of their Spanish yes/no-questions. Three of these used rising L+H* HH% and four used falling H+L* L%. It would be more

all-encompassing, however, to group together participants who produced a specific contour for at least 50% of their total yes/no-questions in Spanish and those who did not. In this case, seven participants produced their preferred contour at least 50% of the time. Of these, nine participants produced rising L+H* HH% as their preferred intonation pattern, one participant preferred alternate rising L* HH%, and four participants preferred falling H+L* L%. This leaves five participants (7, 8, 12, 15 and 16) who produced their preferred intonation pattern for less than 50% their yes/no-questions in Spanish. This means that they produced other contours at relatively high frequencies. Participants 7, 8 and 12 used rising L+H* HH% and alternate rising L* HH% the most. Participant 15 used 10 different contours for Spanish yes/no-questions and thus, had the highest production of 'other' contours (L* L% was produced for 17% of Spanish tokens). Participant 16 also produced several intonation contours at around 20% each (L+H* L% was produced for 17% of Spanish tokens).

Although participant 5 was mentioned with the participants who produced a specific contour over 50% of the time and participants 7 and 12 were not, it is important to note that these three participants used alternate rising L* HH% as their preferred contour. This is different from the typical rising pattern found in other varieties of peninsular Spanish (L+H* HH%) and it is also different from the falling pattern typical of Galician (H+L* L%). This contour was only a preferred contour in Spanish yes/no-questions.

4.3.3 Individual Results in Galician

As seen in Table 4.8, nine participants produced rising L+H* HH% as their preferred contour and ten participants produced falling H+L* L% as their preferred contour. All of these participants were Galician-dominant except for participants 4 and 16). Just like in Spanish, rates at which participants produced their preferred intonation pattern varied greatly. Nine participants produced one of these two contours for at least 90% of their total yes/no-questions in Galician. Of these nine, four produced rising L+H* HH% and five produced falling H+L* L%.

Again, it would be more all-encompassing to group together participants who produced a specific contour for at least 50% of their total yes/no-questions in Spanish versus those who

did not. Fifteen participants produced a specific contour for at least 50% of their Galician yes/no-questions. Nine of these produced rising L+H* HH% and seven produced falling H+L* L%.

This leaves three participants whose preferred contours were produced for less than 50% of their Galician yes/no-questions. These happen to be the same participants who had the same issue in Spanish yes/no-questions. Participant 8 produced falling H+L* L% as his preferred intonation and his second preferred was rising L+H* HH%. Participants 12 and 15 both produced falling H+L* L% as their most common contour followed by their second favorite contour, alternate rising L* HH%.

4.3.4 Individual Results across Spanish and Galician

As seen in Table 4.8, results show that fifteen out of nineteen participants produced the same (most frequent) intonation pattern for both Spanish and Galician. This number includes participants 7 and 12 who produced a different contour in one of the languages by 1% more than the contour that was used in both languages.

Nine participants (1, 3, 7, 9, 10, 17, 18, 19 and 20) used rising L+H* HH% across both languages and six participants (2, 6, 11, 12, 13 and 15) used falling H+L* L% across both languages. There were four participants (4, 5, 8 and 16) who had different preferred intonation patterns for Spanish and Galician.

Of the participants who used rising L+H* HH% across the two languages, all belonged to the younger group except for participants 10 and 17. Five of these participants were females and three were males. All of these participants were Spanish-dominant except for participants 17 and 20.

As for the participants who produced falling H+L* L% across the two languages, all of these participants were older, except for participants 13 and 15. All of these participants were female except for participant 15. These participants were also Galician-dominant except for participant 6. Possible reasons for why these participants strayed from the intonation tendencies associated with their age, gender or dominant language group will be discussed in Chapter 5.

Table 4.8: Nuclear Configurations Produced by Individuals by Language

	Spanish				**Galician**			
Participant [#]	**L+H*HH%** [%]	**H+L*L%** [%]	**L*HH%** [%]	**Other**[a] [%]	**L+H*HH%** [%]	**H+L*L%** [%]	**L*HH%** [%]	**Other** [%]
1	87	-	-	14	96	-	-	4
2	-	99	1	-	-	100	-	-
3	86	-	-	14	75	1	1	23
4	62	24	2	12	38	51	8	3
5	14	7	72	7	3	64	31	6
6	-	99	-	1	-	100	-	-
7	42	-	43	16	54	-	6	40
8	47	1	29	22	30	44	13	14
9	97	-	1	1	92	2	-	6
10	95	-	-	5	90	-	-	11
11	-	100	-	-	-	97	-	3
12	27	3	45	26	34	20	33	14
13	-	100	-	-	-	99	-	1
15	12	27	20	42	3	35	22	40
16	26	24	22	28	2	92	2	4
17	97	-	3	-	94	-	3	3
18	65	-	18	17	70	-	7	22
19	74	-	7	19	53	-	27	19
20	78	-	6	17	77	-	8	16

[a]Nuclear Configurations Grouped under "Other": H+L*HH%, H+L*HL%, H+L*LH%, L*HL%, L*L%, L*LH%, L+>H*l%, L+H*HL%, L+H*L%, L+H*LH%

As previously mentioned, there were four participants who had different preferred intonation patterns for Spanish and Galician. Two of these were Spanish-dominant (4 and 16) and the other two were Galician-dominant (5 and 8). Two of these four participants were males (4 and 8), while the other two were females (5 and 16), and all four were part of the younger group. Participants 4 and 8 both used rising L+H* HH% in Spanish and switched to falling H+L* L% in Galician yes/no-questions. Participant 5 also used a rising pattern in Spanish, but it was alternate rising L* HH%, and then used falling H+L* L% in Galician. Finally, participant 16 produced an array of intonation patterns for Spanish yes/no-questions but was very consistent in using falling H+L* L% in Galician yes/no-questions.

Figures 4.12 - 4.15 illustrate a difference between two participants who used the same intonation pattern for yes/no-questions in both Spanish and Galician. Figures 4.12 and 4.13 show that participant 2, who was Galician-dominant, used the same falling H+L* L% contour for both Spanish and Galician yes/no-questions. Figures 4.14 and 4.15 show how participant 1, who was Spanish-dominant, used the same rising L+H* HH% contour for both Spanish and Galician. Figures 4.16 and 4.17, on the other hand, show that participant 4, although Spanish-dominant, used different intonation patterns for Spanish and Galician yes/no-questions.

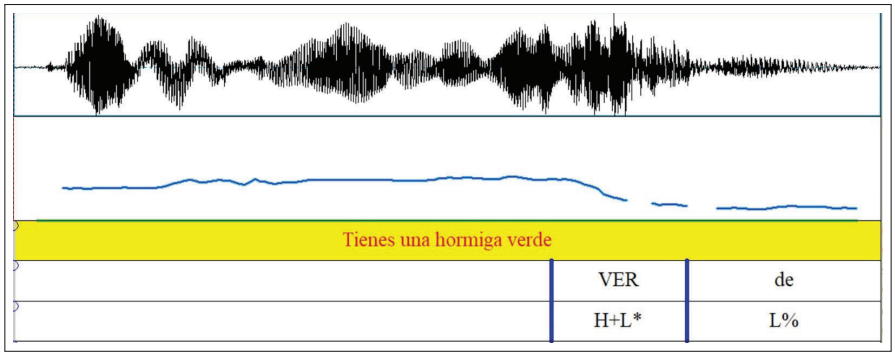


Figure 4.12: Galician-Dominant Bilingual's Yes/No-Question in Spanish

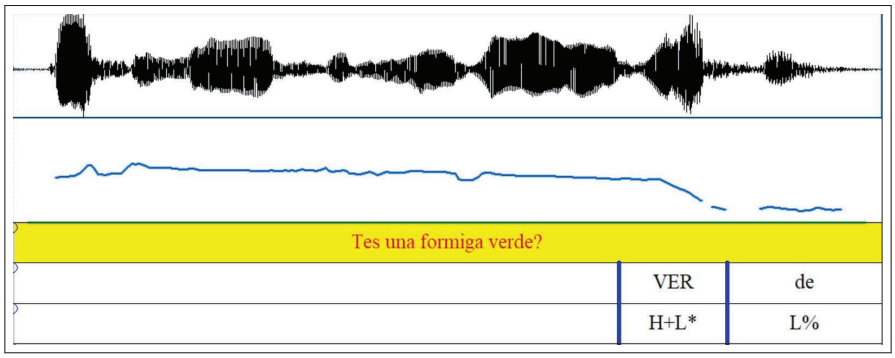


Figure 4.13: Galician-Dominant Bilingual's Yes/No-Question in Galician

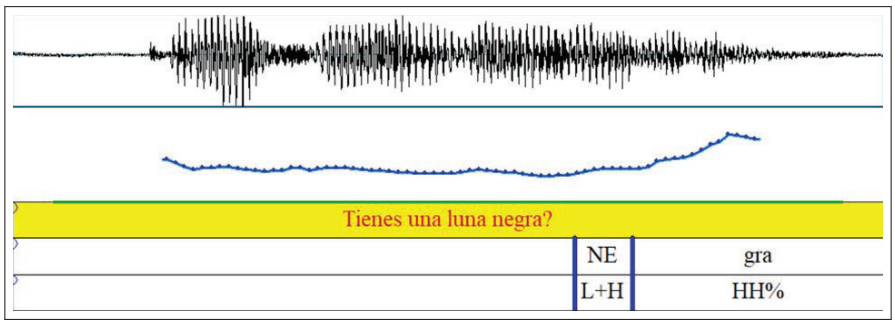


Figure 4.14: Spanish-Dominant Bilinguals' Yes/No-Question in Spanish

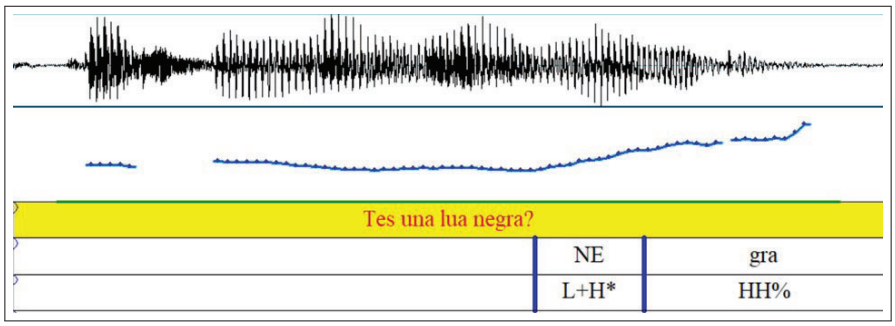


Figure 4.15: Spanish-Dominant Bilinguals' Yes/No-Question in Galician

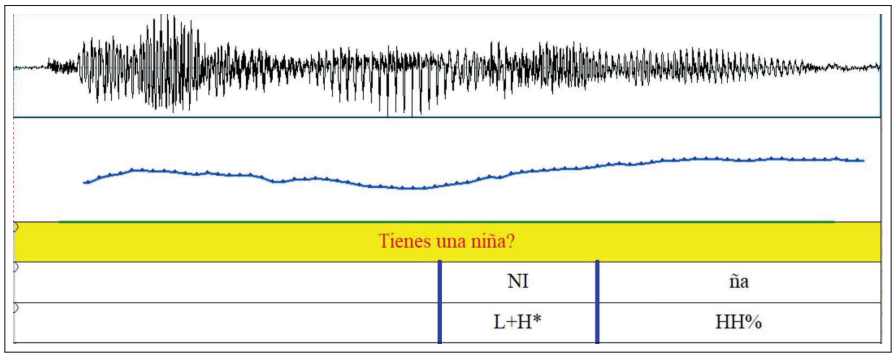


Figure 4.16: Spanish-Dominant Bilinguals' Rising Intonation in Spanish Yes/No-Question

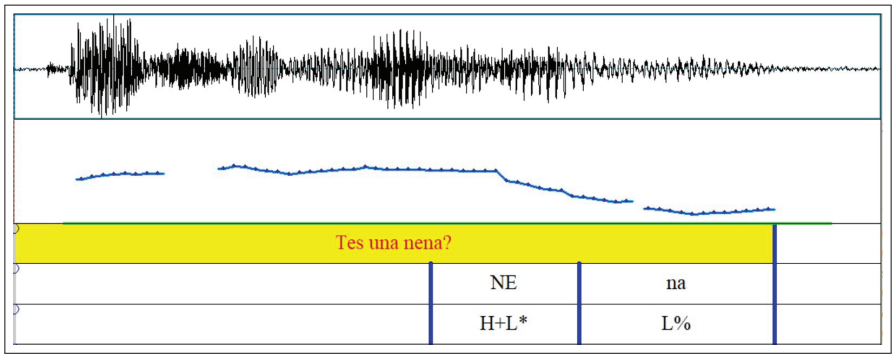


Figure 4.17: Spanish-Dominant Bilinguals' Falling Intonation in Galician Yes/No-Question

4.4 Summary

In Spanish yes/no-questions, we found that the three most common contours were rising L+H* HH%, falling H+L* L% and alternate rising L* HH%. In Galician yes/no-questions we found that these same contours were also the most frequent. The difference between Spanish and Galician was significant, reflecting that falling H+L* L% contours were used more in Galician than in Spanish and that alternate rising L* HH% was used more in Spanish than in Galician.

The data showed variation among participants. Significant effects were found for gender, age and language dominance. Specifically, younger bilinguals tended to produce rising L+H* HH% and alternate rising L* HH% contours in Spanish and Galician and older bilinguals

produce more falling H+L* L% contours in both languages. Considering gender, women produced mostly falling contours in Galician and Spanish while men produced mostly rising L+H* HH% or L* HH%. With regards to language dominance, Spanish-dominant bilinguals tend to produce rising contour L+H* HH%, but not alternate rising L* HH%. Galician-dominant bilinguals, on the other hand, tend to produce more falling H+L* L% contours.

The comparison of a bilingual's two languages showed that some people used the same intonation pattern in both languages, whereas other participants used different intonation patterns. The participants who produced rising L+H* HH% in both Spanish and Galician were mostly Spanish-dominant. The participants who produced H+L* L% in both Spanish and Galician, conversely, were mostly Galician-dominant. We will discuss the implications of these results in the next chapter.

CHAPTER 5

DISCUSSION AND CONCLUSION

This chapter discusses the results found in Chapter 4 in connection to the research questions stated at the end of Chapter 2. Section 5.1 summarizes the intonation patterns found in Galician Spanish and Galician. Section 5.2 discusses whether participants used similar or different intonation patterns for yes/no-questions in the two languages. Section 5.3 examines preferences for certain intonation contours based on age, gender and language dominance. Section 5.4 recognizes limitations and states directions for future research. Finally, Section 5.5 concludes the current study with the main findings and contributions to the field.

5.1 Intonation Patterns in Spanish and Galician Yes/No-Questions

The first research question asked which intonation patterns are found in Galician and Galician Spanish yes/no-questions. This question was of interest considering that in Spanish, speakers could use either a rising pattern like most Peninsular varieties of Spanish (Face, 2004; 2006; Navarro Tomas, 1974; Prieto, 2004; Sosa, 1999; Quilis 1988; 1993) or a final-falling pattern like other northern varieties of Spanish and Galician (Elordieta & Romero, 2017; Fernandez-Rei, 2011; 2016; 2019; Lopez-Bobo & Cuevas-Alonso, 2010; Porto Dapena, 1977; Robles-Puente, 2011). In Galician, bilinguals could either use a final-falling pattern (Fernández Rei & Escourido Perna, 2008; Fernandez Rei, 2016, 2019; Martinez Celdrán et al. 2007), typical of the northern regions of Spain in both Spanish and other languages (Basque and Galician), a circumflex contour (Perez Castillejo, 2012; Sobrino Perez, 1999) or a rising pattern indicating Spanish influence. The hypothesis for this research questions was that Galician and Spanish yes/no-questions would show a variety of final-falling contours and final-rising contours as were found in yes/no-questions in Galician Spanish in Peres Castillejo (2012).

Findings from the current study suggest that various rising and falling patterns are found in yes/no-questions in both Spanish and Galician. Yes/no-questions in our data showed the same intonation patterns across both languages, but they occurred with different frequencies. Out of 1,330 yes/no-questions in Spanish, 88% were produced with one of three intonation patterns. 48% of yes/no-questions in Spanish had a typical Peninsular rising pattern L+H* HH%. 26% had a falling intonation pattern H+L* L%, typical of northern varieties of Peninsular Spanish and 14% had an alternate rising pattern L* HH% without a rise in the nuclear pitch accent. Although examples of 10 additional intonation patterns were documented in Spanish yes/no-questions, none of them exceeded 2% of the total data.

Similar to Spanish, 89% of the 1,223 yes/no-questions in Galician were produced with one of the same three intonation patterns. Rising L+H* HH% made up 44% of Galician yes/no-questions, falling H+L* L% made up 36%, and the alternate rising pattern L* HH% made up 9%. Examples of 9 other nuclear configurations were attested in the data, but again, none of these occurred more than 2% of the time.

The main difference between contours used in Spanish versus in Galician was that most standard of the standard rising L+H* HH% patterns (54% in Spanish and 46% in Galician) were found in Spanish and most of the falling patterns were found in Galician (56% in Galician and 44% in Spanish). The alternate rising pattern L* HH% had a starker difference between its use in Spanish and in Galician. The alternate rising contour was produced much more frequently in Spanish (65%) than in Galician (35%).

The three main intonation patterns found in the current study were also documented in Perez Castillejo (2012) for Galician Spanish. However, one contour that was previously documented for yes/no-questions in Galician Spanish (Fernandez Rei, 2007; Perez Castillejo, 2012) is circumflex L+H* HL%. Fernandez Rei (2007) and Perez Castillejo (2012) found that this pattern is produced by participants from the Baixo Minho region (southwestern Galicia). None of the participants in the current study were from this region and this contour was only found in 3% of Spanish data and 2% of Galician data.

5.2 Bilinguals' Intonation Patterns across Spanish and Galician

The second research question examined in this thesis is whether bilinguals exhibit the same intonation pattern for yes/no-questions in both Spanish and Galician or if they use different intonation patterns in each language. Results of the current study confirm the hypothesis presented in Chapter 2 that stated that participants would use the same intonation across two languages (based on their language dominance).

Although no previous study has looked at the effect of language dominance on intonation in both Spanish and Galician, the hypothesis for this research question was based on Perez Castillejo (2012) which was the first intonation study done on yes/no-questions in Galician Spanish that considered bilinguals' language background through the use of a questionnaire. Perez Castillejo (2012) found that participants whose parents spoke more to them in Spanish, produced more rising L+H* HH% contours. Since the current study examines both the Galician and Spanish contours produced by bilinguals, their language dominance score is the same for both languages, and thus it was hypothesized that bilinguals would produce the same intonation patterns in Galician and Spanish.

Results supported this hypothesis and showed that most bilinguals use the same intonation pattern for yes/no-questions across both languages. Fifteen out of nineteen participants (79%) (including participants 7 and 12) used the same nuclear configurations for yes/no-questions in both Spanish and Galician.

Four participants preferred different intonation patterns for each language. Of these four participants, three participants (4, 8 and 16) used L+H* HH% for Spanish and falling H+L* L% for Galician yes/no-questions, and another participant (participant 5) used alternate rising L* HH% in Spanish and falling H+L* L% in Galician.

Chapter 2 mentioned previous research that has been conducted on intonational transfer. Works such as Elordieta (2003) and Elordieta and Calleja (2005) showed prosodic characteristics of Spanish in Basque in the Basque Country and Bullock (2009) found prosodic characteristics of English in the French of Frenchville, Pennsylvania. These three examples

show prosodic influence from the majority language to the minority language. Intonational transfer can also occur from the minority language to the majority language as seen in Muntendam and Torreira (2016) where prosodic characteristics of Quecua were found in Spanish and in Simonet (2011) where prosodic characteristics of Catalan were found in the region's Spanish. The current study shows examples of bidirectional transfer; there are examples Galician prosody in the region's Spanish as well as examples of Peninsular Spanish prosody in Galician.

5.3 Effects of Age, Gender and Language Dominance

The third research question investigated whether factors such as age, gender and language dominance affect bilinguals' intonation patterns in Spanish and Galician yes/no-questions. Research question 3 is related to research question 2 but differ in that research question 3 focuses on individual results regarding several factors. Thomason and Kaufman (1988) argue that many individual factors (such as age, gender and language dominance) can affect borrowing that takes place between two languages in contact.

Findings showed that age played a role in participants' preference for using rising versus falling contours in both languages. Younger bilinguals produced more rising contours (L+H* HH% or L* HH%), and older participants produced more falling contours H+L* L%. Results were the same for age across both languages. Thus, older participants used the contour that is typical of Galician more than the younger participants, which can be explained by their language use. In line with this is research performed by the Galician Institute of Statistics (2019) which shows that older Galicians speak Galician more than younger Galicians (see Table 1). These results are also in line with a previous study (Perez Castillejo, 2012), which accounted for the effects of age on intonation in yes/no-questions in Galician Spanish and found that speakers who were born before 1975 disfavor rising boundary tones. Older participants tend to produce more falling H+L* L% contours than younger participants.

With regards to gender, results showed that women produced more falling H+L* L% contours than men in both Spanish and Galician. Men produced slightly more L+H* HH% than women in both Spanish and Galician. Finally, L* HH% was produced more by men than

women in both Spanish and Galician. This goes against the hypothesis stated in Chapter 2 which was based on Sobrino Perez (1999) who hinted at the possibility of women producing more rising patterns than men in yes/no-questions.

Findings also demonstrated that language dominance played a role in the intonation pattern used in Spanish and Galician yes/no-questions. Participants had a tendency to produce intonation patterns associated with their dominant language, no matter which language they were speaking in. Galician-dominant participants produced more falling H+L* L% and alternate rising L* HH%, and Spanish-dominant participants produced more rising L+H* HH% contours in yes/no-questions.

These findings fall in line with a previous study that looked at language exposure to Spanish and Galician (Perez Castillejo, 2012). This study did not measure language dominance as we did, by using Bilingual Language Profiles, but rather had participants complete a questionnaire regarding their previous exposure to Galician. The study showed that when participants' parents had not spoken Galician at home, participants produced more final-rising intonation contours. This is how Spanish-dominant bilinguals behaved in the current study.

5.3.1 Unexpected Individual Differences

Although the Chi-square tests showed that women and older bilinguals produced more falling patterns, participants 10 and 17 (two older women who live in Chantada), consistently preferred rising L+H* HH% in both Spanish and Galician yes/no-questions. This may be due to the participants having suffered language discrimination during Franco's regime. Galician was suppressed and not allowed to be spoken during this time which likely lowered the amount of input they received in the language in their younger years. Therefore, although they are older participants and women (and participant 17 is Galician-dominant according to the BLP), they do not produce intonation contours common in northern varieties of Spanish or Galician.

As for language dominance, participants 17 and 20 were both Galician-dominant and consistently preferred rising L+H* HH% in both Spanish and Galician. Participant 17's

preference for rising patterns can be explained with the reasons mentioned above as can her language dominance in Spanish. Because she was not allowed to speak Galician publicly when she was younger, maybe she believes she is not as dominant in the language. Participant 20, on the other hand may identify as Galician-dominant because that is the language he always speaks with his family. However, living in such a highly populated city like A Coruña (a Galician city in which Spanish is spoken more so than in than smaller towns) may have impacted his prosody. Being part of the younger group and male group may also be related to his preference for rising intonation. Participant 6's language dominance also did not match up with her configuration preference (although her gender and age did). She was Spanish-dominant according to the BLP but is married to a man who only speaks to her in Galician, which may have affected her prosody.

Although participants 13 and 15 formed part of the younger group (and despite participant 15 being male), rising L+H* HH% was not their preferred intonation pattern in Spanish or Galician. These two participants used falling H+L* L% as their most frequent contour in both languages. Participant 15, however, did so with very low percentages for his preferred contour, which leads us to the following set of unexpected results.

Several young male participants such as 7, 8, 12 and 15 produced up to ten intonation patterns, resulting in lower percentages for their preferred intonation contours. As the Chi-square test showed, younger participants produced 'other' intonations which in turn made participants produce their preferred configurations in lower percentages. This is similar to stylistic variation previously documented in Galician Spanish by Perez Castillejo (2012). In her study though, participants varied their intonation based on the formality of the task. She concluded that this could be due to the lack of prestige Galician has in formal settings. In the current study, the men were not consistent in using a particular intonation contour, having their most common contours occur only between 20-45% of the time. Their lack of consistency could be due to being part of a work force which values Spanish over Galician. As Dapena (2011) mentions, Galician has lower prestige than Spanish and is associated with a lack of formal education. Regueira (1978) also mentions that linguistic prejudices still exist

today and that the use of Galician in official places can be controversial to some like the Bilingue movement (which does not actually favor official bilingualism).

5.4 Limitations and Directions for Future Studies

Unfortunately, several recordings had to be discarded due to the recording location not being as quiet as expected. Data were collected in several places for the convenience of the participants. Had the game taken place in the same quiet room, these noises could have been avoided. On the other hand though, we might not have had as many participants because transportation would have been an issue.

A second limitation was not being able to maintain language dominance as a continuous variable. Analyzing language dominance as a continuous variable would have provided a more fine-grained analysis. This would have been ideal, but since goodness of fit was not met in the multinomial regression (see footnote 1 in Chapter 3), language dominance was categorized into two groups in order to run Chi-square tests. These two groups were split up by Galician dominance (negative BLP scores) and Spanish dominance (positive BLP scores). Although a binary analysis of this variable was not initially intended, it still proved to be significant.

Age, like language dominance, was also divided into two groups: younger (21-48 years old) and older (50-62 years old). This was not ideal, but it did separate participants who had lived through Franco's regime and those who lived their youth in a more bilingual Galicia. A future study with more participants could include a wider age range to compare the differences between three age groups and see if there is a language change in progress.

5.5 Main Findings and Contributions

The current study set out to document intonation patterns in yes/no-questions in Galician Spanish and Galician. It also aimed to see if bilinguals produce different intonation patterns for the same question type across the two languages. Additionally, this study aimed to

find out if age, gender and language dominance affected bilinguals' preference for a certain intonation contour.

These questions were answered by carefully preparing the task to elicit yes/no-questions, ideal for acoustic analysis. This task resulted in the production of 2,553 tokens (1,330 for Spanish and 1,223 for Galician). Each of these were analyzed acoustically and annotated using SP_ToBI conventions. Bilingual Language Profile scores were calculated to determine language dominance and multiples Chi-square tests were performed in order to see if there was an effect of age, gender and language dominance on the nuclear configurations used. This was done for both Spanish data and Galician data followed by another Chi-square test to see if there was a difference between nuclear configurations used and the language that was being spoken.

There were six main findings in the current study: (1) there are three commonly used intonation patterns present in Galician Spanish and Galician (L+H* HH%, H+L* L% and L* HH%), (2) the majority of bilinguals tended to use the same intonation pattern across both languages, (3) older bilinguals produced more falling H+L* L% contours than younger bilinguals, (4) women produced more falling H+L* L% contours while men produce more rising L+H* HH% and alternate rising L* HH%, (5) Spanish-dominant bilinguals tend to have rising L+H* HH% intonation and Galician-dominant bilinguals tend to have falling H+L* L% or alternate rising L* HH%, (6) both rising L+H* HH% and falling H+L* L% contours were very common in yes/no-questions in both languages, but alternate rising L* HH% was more common in Spanish than in Galician.

The current study makes several contributions to the fields of phonetics and sociolinguistics in Galicia. It is the first large scale study to examine the intonation patterns of yes/no-questions produced by so many male and female bilinguals in Spanish and Galician. Only one previous study (Fernandez Rei, 2019) compared the intonations of bilinguals' yes/no-questions in both Galician and Spanish, but that study was based on the productions of only five participants who were all female. Moreover, previous studies on intonation in the region have used questionnaires (Perez Castillejo, 2012) or linguistic interviews (Fernandez Rei, 2019), but language dominance has never before been measured through a test such

as the Bilingual Language Profile encompassing topics such as language history, language use, language attitudes and proficiency levels. The participants for the current study were carefully chosen to be balanced in gender and language dominance. This study also provided the highest number of tokens recorded and analyzed in both Galician and Spanish to date.

Based on our data, we disagree with Fernández Rei's statement that linguistic change caused by contact has not taken place in Galician Spanish. Fernandez Rei (2019) which was based on 57 questions (26 yes/no-questions in Spanish and 31 in Galician), did not show evidence for linguistic change. Data from the current thesis, which is based on a larger group of participants and more tokens, does suggest an influence from Spanish to Galician. The different findings could be due to differences in participant characteristics, or differences in tasks. The current study supports Perez Castillejo (2012) who found that Peninsular Spanish has influenced Galician Spanish, causing contours such as L* HH% and L+H* HH% to be prevalent in yes/no-questions. These were prevalent in the Spanish data of the current study as well. The current study goes a step further to assert that these contours (especially rising L+H* HH%) are also very common in Galician yes/no-questions.

Galician and Spanish have a long, intertwined history. Contact-induced prosodic influence from one language unto the other and vice-versa was evident in the data. Rising and falling patterns were present in both Galician Spanish and Spanish yes/no-questions. Bilinguals mostly produced the same intonation patterns across languages, but much intonational and individual variation was present too. This individual variation was related to the bilingual's age, gender and language dominance. Future studies on yes/no questions in Galician and Galician Spanish could consider formality of speech in both languages as Perez Castillejo (2012) did and include participants from several small towns in the region. Future studies could also look at intonation patterns of *wh*-questions and statements as these were also collected but not used for the current study.

APPENDIX A

TASK MATERIALS

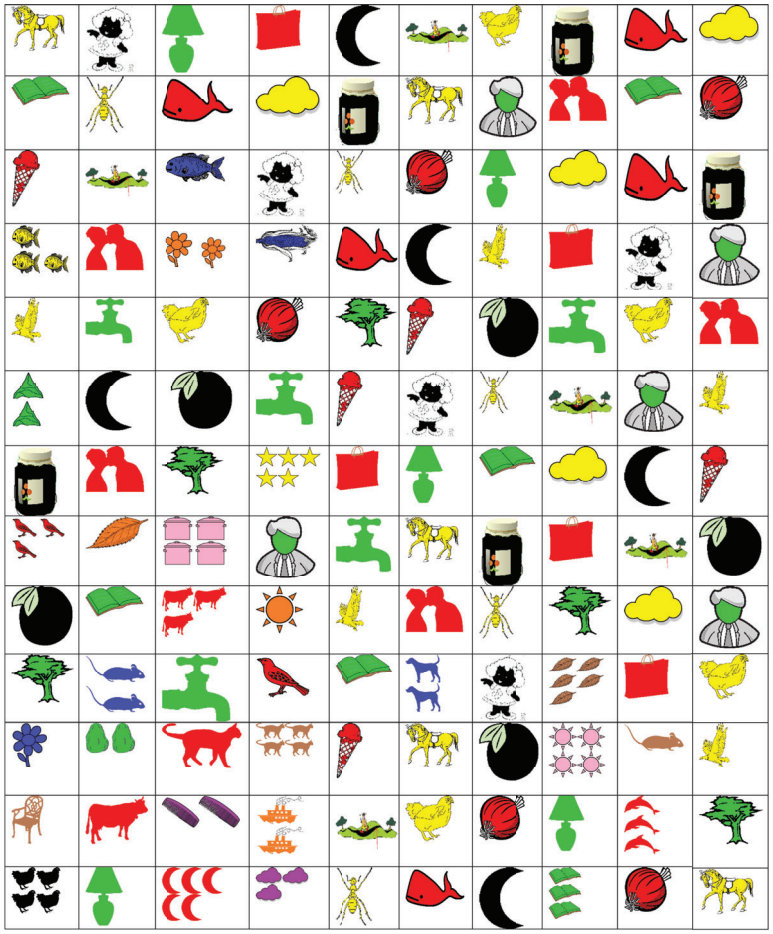


Figure A.1: Object Sheet for Yes/No-Question Elicitation Task

Table A.1: Yes/No-Questions Used in Task

Spanish Questions	**Galician Questions**	**English Translation**
¿Tienes una nube?	Tes una nube?	Do you have a cloud?
¿Tienes un caballo?	Tes un cavalo?	Do you have a horse?
¿Tienes una gallina ?	Tes una galiña?	Do you have a chicken?
¿Tienes una hormiga ?	Tes una formiga?	Do you have an ant?
¿Tienes un águila?	Tes una águia?	Do you have an eagle?
¿Tienes una ballena?	Tes una balea?	Do you have a whale?
¿Tienes un helado?	Tes un xeado?	Do you have an ice-cream?
¿Tienes una bolsa?	Tes una bolsa?	Do you have a bag?
¿Tienes un beso?	Tes un bico?	Do you have a kiss?
¿Tienes una cebolla?	Tes una cebola?	Do you have an onion?
¿Tienes una niña?	Tes una nena?	Do you have a girl?
¿Tienes un camino?	Tes un camiño?	Do you have a path?
¿Tienes una luna?	Tes una lúa?	Do you have a moon?
¿Tienes una mermelada?	Tes una marmelada?	Do you have a jam?
¿Tienes una mandarina?	Tes una mandarina?	Do you have a mandarin?
¿Tienes un hombre?	Tes un home?	Do you have a man?
¿Tienes un libro?	Tes un libro?	Do you have a book?
¿Tienes un grifo?	Tes una billa?	D you have a faucet?
¿Tienes un árbol?	Tes un árbore?	Do you have a tree?
¿Tienes una lámpara?	Tes una lámpada?	Do you have a lamp?
¿Tienes algo amarillo?	Tes algo amarelo?	Do you have something yellow?
¿Tienes algo amarillo?	Tes algo amarelo?	Do you have something yellow?
¿Tienes algo amarillo?	Tes algo amarelo?	Do you have something yellow?
¿Tienes algo amarillo?	Tes algo amarelo?	Do you have something yellow?
¿Tienes algo amarillo?	Tes algo amarelo?	Do you have something yellow?
¿Tienes algo rojo?	Tes algo vermello?	Do you have something red?
¿Tienes algo rojo?	Tes algo vermello?	Do you have something red?
¿Tienes algo rojo?	Tes algo vermello?	Do you have something red?
¿Tienes algo rojo?	Tes algo vermello?	Do you have something red?

Table A.1 Continued

Spanish Questions	**Galician Questions**	**English Translation**
¿Tienes algo rojo?	Tes algo vermello?	Do you have something red?
¿Tienes algo negro?	Tes algo negro?	Do you have something black?
¿Tienes algo negro?	Tes algo negro?	Do you have something black?
¿Tienes algo negro?	Tes algo negro?	Do you have something black?
¿Tienes algo negro?	Tes algo negro?	Do you have something black?
¿Tienes algo negro?	Tes algo negro?	Do you have something black?
¿Tienes algo verde?	Tes algo verde?	Do you have something green?
¿Tienes algo verde?	Tes algo verde?	Do you have something green?
¿Tienes algo verde?	Tes algo verde?	Do you have something green?
¿Tienes algo verde?	Tes algo verde?	Do you have something green?
¿Tienes algo verde?	Tes algo verde?	Do you have something green?
¿Tienes una nube negra?	Tes una nube negra?	Do you have a black cloud?
¿Tienes un caballo verde?	Tes un cavallo verde?	Do you have a green horse?
¿Tienes una gallina negra?	Tes una galiña negra?	Do you have a black chicken?
¿Tienes una hormiga verde?	Tes una formiga verde?	Do you have a green ant?
¿Tienes un águila roja?	Tes una águia vermello?	Do you have a red eagle?
¿Tienes una ballena amarilla?	Tes una balea amarela?	Do you have a yellow whale?
¿Tienes un helado verde?	Tes una xeado verde?	Do you have a green ice-cream?
¿Tienes una bolsa negra?	Tes una bolsa negra?	Do you have a black bag?
¿Tienes un beso amarillo?	Tes un bico amarelo?	Do you have a yellow kiss?
¿Tienes una cebolla verde?	Tes una cebola verde?	Do you have a green onion?
¿Tienes una niña verde?	Tes una nena verde?	Do you have a green girl?
¿Tienes un camino amarillo?	Tes un camiño amarelo?	Do you have a yellow path?
¿Tienes una luna amarilla?	Tes una lúa amarela?	Do you have a yellow moon?
¿Tienes una mermelada roja?	Tes una marmelada vermello?	Do you have a red jam?
¿Tienes una mandarina roja?	Tes una mandarina vermella?	Do you have a red mandarin?
¿Tienes un hombre rojo?	Tes un home vermello?	Do you have a red man?
¿Tienes un libro negro?	Tes un libro negro?	Do you have a black book?
¿Tienes un grifo negro?	Tes una billa negra?	Do you have a black faucet?

Table A.1 Continued

Spanish Questions	**Galician Questions**	**English Translation**
¿Tienes un árbol rojo?	Tes un árbore vermello?	Do you have a red tree?
¿Tienes una lámpara amarilla?	Tes una lámpada amarela?	Do you have a yellow lamp?
¿Tienes un caballo amarillo?	Tes un cavallo amarelo?	Do you have a yellow horse?
¿Tienes una hormiga amarilla?	Tes una formiga amarela?	Do you have a yellow ant?
¿Tienes una nube amarilla?	Tes una nube amarela?	Do you have a yellow cloud?
¿Tienes un árbol amarillo?	Tes un árbore amarelo?	Do you have a yellow tree?
¿Tienes una gallina amarilla?	Tes una galiña amarela?	Do you have a yellow chicken?
¿Tienes una bolsa roja?	Tes una bolsa vermello?	Do you have a red bag?
¿Tienes una ballena roja?	Tes una balea vermella?	Do you have red whale?
¿Tienes un helado rojo?	Tes un xeado vermello?	Do you have a red ice-cream?
¿Tienes una cebolla roja?	Tes una cebola vermello?	Do you have a red onion?
¿Tienes un beso rojo?	Tes un bico vermello?	Do you have a red kiss?
¿Tienes una luna negra?	Tes una luna negra?	Do you have a black moon?
¿Tienes una mermelada negra?	Tes una marmelada negra?	Do you have a black jam?
¿Tienes un camino negro?	Tes un camiño negro?	Do you have a black path?
¿Tienes una niña negra?	Tes una nena negra?	Do you have a black girl?
¿Tienes un águila negra?	Tes una águia negra?	Do you have a black eagle?
¿Tienes una lámpara verde?	Tes una lámpada verde?	Do you have a green lamp?
¿Tienes un grifo verde?	Tes un grifo verde?	Do you have a green faucet?
¿Tienes un libro verde?	Tes un libro verde?	Do you have a green book?
¿Tienes un hombre verde?	Tes un home verde?	Do you have a green man?
¿Tienes una mandarina verde?	Tes una mandarina verde?	Do you have a green mandarin?

APPENDIX B

BILINGUAL LANGUAGE PROFILE QUESTIONNAIRE

Participant # _____

Bilingual Language Profile: Español-Gallego

Nos gustaría pedir su ayuda para contestar a las siguientes preguntas sobre su historial lingüístico, uso, actitudes y competencia. La encuesta contiene 19 preguntas y le llevará menos de 10 minutos para completar. Esto no es una prueba, por tanto no hay respuestas correctas ni incorrectas. Por favor conteste cada pregunta y responda con sinceridad, ya que solamente así se podrá garantizar el éxito de esta investigación. Muchas gracias por su ayuda.

I. Información biográfica

Nombre _____ Fecha de hoy _____/_____/_____

Edad_____ ☐ Hombre / ☐ Mujer Lugar de residencia actual: ciudad/estado_____ País_____

Nivel más alto de formación académica: ☐ Menos de la escuela secundaria ☐ Escuela Secundaria
☐ Un poco de universidad ☐ Universidad (diplomatura, licenciatura.)
☐ Un poco de escuela graduada ☐ Máster
☐ Doctorado ☐ Otra: _____

¿Dónde nació? _____
Uso de lenguas:

En un día típico, está expuesto a:
Sólo español Sólo gallego
1 2 3 4 5 6 7 8 9

En un día típico, usted habla:
Sólo español Sólo gallego
1 2 3 4 5 6 7 8 9

Lengua(s) que usa con su padre: _____ con su madre_____
hermanos/as:_____ amigos/as: _____
¿Dónde nació su padre?_____¿Dónde nació su madre? _____

Cuando tiene que hablar con alguien que no conoce usa **español**
Nunca Siempre
1 2 3 4 5 6 7 8 9
Cuando tiene que hablar con alguien que no conoce usa **gallego**
Nunca Siempre
1 2 3 4 5 6 7 8 9

En el sistema educativo la lengua que ha usado es: español gallego ambos otro
¿Dónde estudió? Primaria:_____Secundaria:_____Otro:_____
La lengua que usa en casa es: español gallego ambos otro
¿Dónde creció? _____
La lengua en que prefiere leer es: español gallego ambos otro
La lengua en que prefiere escuchar es: español gallego ambos otro
La lengua en que prefiere hablar es: español gallego ambos otro
La lengua en que prefiere escribir es: español gallego ambos otro

Acento nativo:

Desde su percepción, ¿cree que tiene un acento que no corresponde con el de un hablante nativo de **español**?
Acento muy fuerte Acento nativo (sin acento)
1 2 3 4 5 6 7 8 9

Desde su percepción, ¿cree que tiene un acento que no corresponde con el de un hablante nativo de **gallego**?
Acento muy fuerte Acento nativo (sin acento)
1 2 3 4 5 6 7 8 9

1

II. Historial lingüístico

En esta sección, nos gustaría que contestara algunas preguntas sobre su historial lingüístico marcando la casilla apropiada.

1. ¿A qué edad **empezó a aprender** las siguientes lenguas?

Español

☐ Desde el Nacimiento ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20+

Gallego

☐ Desde el Nacimiento ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20+

2. ¿A qué edad **empezó a sentirse cómodo** usando las siguientes lenguas?

Español

☐ Tan pronto como recuerdo ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20+ ☐ aún no

Gallego

☐ Tan pronto como recuerdo ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20+ ☐ aún no

3. ¿Cuántos años de **clases (gramática, historia, matemáticas, etc..)** ha tenido en las siguientes lenguas (desde la escuela primaria a la universidad)?

Español

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20+

Gallego

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20+

4. ¿Cuántos años ha pasado en un **país/región** donde se hablan las siguientes lenguas?

Español

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20+

Gallego

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20+

5. ¿Cuántos años ha pasado en **familia** hablando las siguientes lenguas?

Español

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20+

Gallego

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20+

6. ¿Cuántos años ha pasado en **un ambiente de trabajo** donde se hablan las siguientes lenguas?

Español

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20+

Gallego

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13 ☐ 14 ☐ 15 ☐ 16 ☐ 17 ☐ 18 ☐ 19 ☐ 20+

III. Uso de lenguas

En esta sección, nos gustaría que contestara algunas preguntas sobre su uso de lenguas marcando la casilla apropiada. El uso total de todas las lenguas en cada pregunta debe llegar al 100%.

7. En una semana normal, ¿qué porcentaje del tiempo usa las siguientes lenguas con **sus amigos**?

	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Español	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Gallego	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Otras lenguas	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

8. En una semana normal, ¿qué porcentaje del tiempo usa las siguientes lenguas con **su familia**?

	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Español	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Gallego	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Otras lenguas	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

9. En una semana normal, ¿qué porcentaje del tiempo usa las siguientes lenguas en **la escuela/el trabajo**?

	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Español	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Gallego	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Otras lenguas	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

10. Cuando se habla a usted mismo, ¿con qué frecuencia **se habla a sí mismo** en las siguientes lenguas?

	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Español	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Gallego	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Otras lenguas	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

11. Cuando hace cálculos contando, ¿con qué frecuencia **cuenta** en las siguientes lenguas?

	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Español	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Gallego	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Otras lenguas	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

IV. Competencia

En esta sección, nos gustaría que considerara su competencia de lengua marcando la casilla de 0 a 6.

	0=no muy bien						*6=muy bien*
12. a. ¿Cómo habla en **Español**?	☐0	☐1	☐2	☐3	☐4	☐5	☐6
b. ¿Cómo habla en **Gallego**?	☐0	☐1	☐2	☐3	☐4	☐5	☐6
13. a. ¿Cómo entiende en **Español**?	☐0	☐1	☐2	☐3	☐4	☐5	☐6
b. ¿Cómo entiende en **Gallego**?	☐0	☐1	☐2	☐3	☐4	☐5	☐6
14. a. ¿Cómo lee en **Español**?	☐0	☐1	☐2	☐3	☐4	☐5	☐6
b. ¿Cómo lee en **Gallego**?	☐0	☐1	☐2	☐3	☐4	☐5	☐6
15. a. ¿Cómo escribe en **Español**?	☐0	☐1	☐2	☐3	☐4	☐5	☐6
b. ¿Cómo escribe en **Gallego**?	☐0	☐1	☐2	☐3	☐4	☐5	☐6

V. Actitudes

En esta sección, nos gustaría que contestara a las siguientes afirmaciones sobre actitudes lingüísticas marcando las casillas de 0 a 6.

	0=no estoy de acuerdo						*6=estoy de acuerdo*
16. a. Me siento "yo mismo" cuando hablo en **Español**.	☐0	☐1	☐2	☐3	☐4	☐5	☐6
b. Me siento "yo mismo" cuando hablo en **Gallego**.	☐0	☐1	☐2	☐3	☐4	☐5	☐6
17. a. Me identifico con una cultura **Hispanohablante**.	☐0	☐1	☐2	☐3	☐4	☐5	☐6
b. Me identifico con una cultura **Gallegohablante**.	☐0	☐1	☐2	☐3	☐4	☐5	☐6
18. a. Es importante para mi usar/llegar a usar **Español** como un hablante nativo.	☐0	☐1	☐2	☐3	☐4	☐5	☐6
b. Es importante para mi usar/llegar a usar **Gallego** como un hablante nativo.	☐0	☐1	☐2	☐3	☐4	☐5	☐6
19. a. Quiero que los demás piensen que soy un hablante nativo de **Español**.	☐0	☐1	☐2	☐3	☐4	☐5	☐6
b. Quiero que los demás piensen que soy un hablante nativo de **Gallego**.	☐0	☐1	☐2	☐3	☐4	☐5	☐6

APPENDIX C

IRB APPROVAL

Florida State UNIVERSITY

Office of the Vice President for Research
Human Subjects Committee
Tallahassee, Florida 32306-2742
(850) 644-8673 · FAX (850) 644-4392

APPROVAL MEMORANDUM

Date: 06/12/2019

To: Erika Hernandez [redacted]

Address: [redacted]

Dept.: MODERN LANGUAGES AND LINGUISTICS

From: Thomas L. Jacobson, Chair

Re: Use of Human Subjects in Research
Effects of Bilingualism on Intonation in Galicia

The application that you submitted to this office in regard to the use of human subjects in the proposal referenced above have been reviewed by the Secretary, the Chair, and two members of the Human Subjects Committee. Your project is determined to be Exempt per 45 CFR § 46.101(b)3 and has been approved by an expedited review process.

The Human Subjects Committee has not evaluated your proposal for scientific merit, except to weigh the risk to the human participants and the aspects of the proposal related to potential risk and benefit. This approval does not replace any departmental or other approvals, which may be required.

If you submitted a proposed consent form with your application, the approved stamped consent form is attached to this approval notice. Only the stamped version of the consent form may be used in recruiting research subjects.

If the project has not been completed by No Expirat you must request a renewal of approval for continuation of the project. As a courtesy, a renewal notice will be sent to you prior to your expiration date; however, it is your responsibility as the Principal Investigator to timely request renewal of your approval from the Committee.

You are advised that any change in protocol for this project must be reviewed and approved by the Committee prior to implementation of the proposed change in the protocol. A protocol change/amendment form is required to be submitted for approval by the Committee. In addition, federal regulations require that the Principal Investigator promptly report, in writing any unanticipated problems or adverse events involving risks to research subjects or others.

By copy of this memorandum, the chairman of your department and/or your major professor is reminded that he/she is responsible for being informed concerning research projects involving human subjects in the department, and should review protocols as often as needed to insure that the project is being conducted in compliance with our institution and with DHHS regulations.

This institution has an Assurance on file with the Office for Human Research Protection. The Assurance Number is IRB00000446.

Cc: Antje Muntendam [redacted] Advisor
HSC No. 2019.27427

APPENDIX D

INDIVIDUAL PARTICIPANT DATA

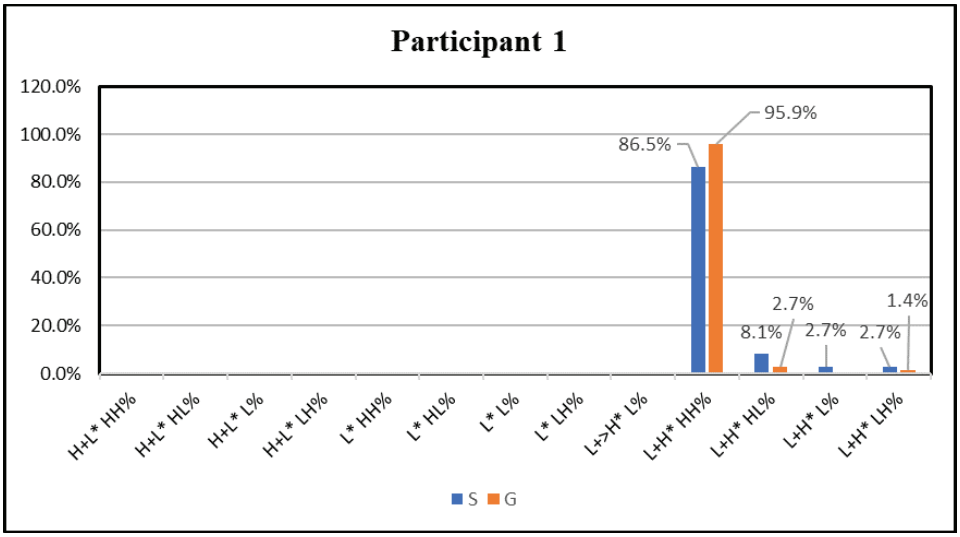


Figure D.1: Nuclear Configuration Distribution for Participant 1 (BLP: 82)

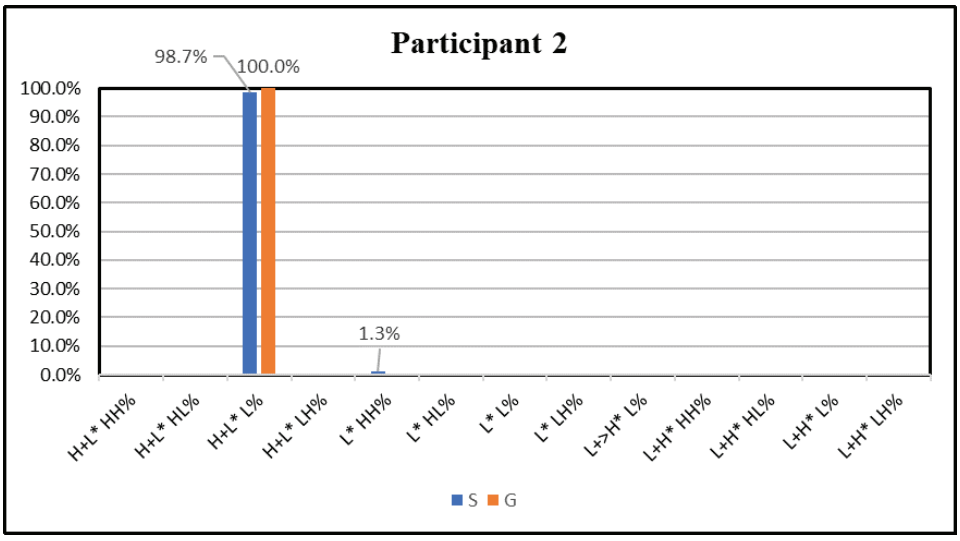


Figure D.2: Nuclear Configuration Distribution for Participant 2 (BLP: -117)

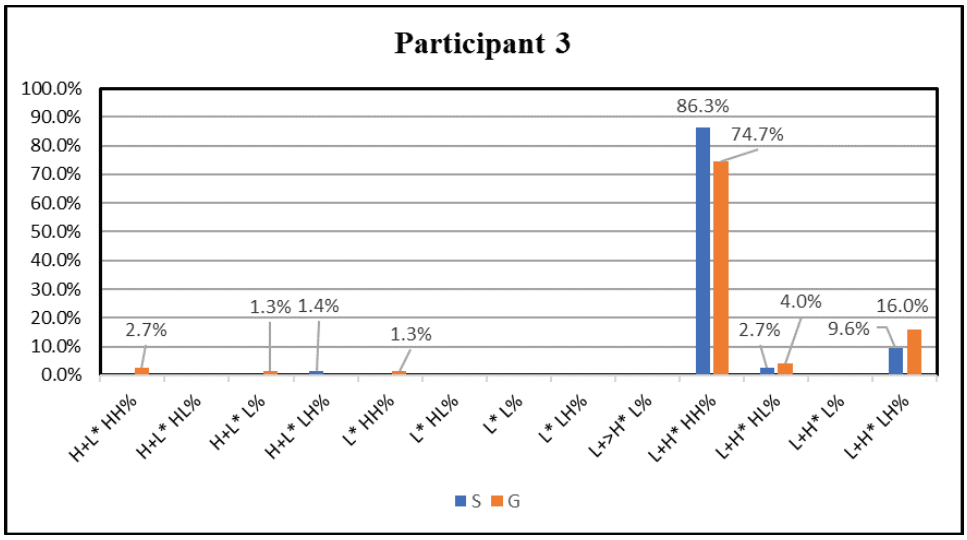


Figure D.3: Nuclear Configuration Distribution for Participant 3 (BLP: 47)

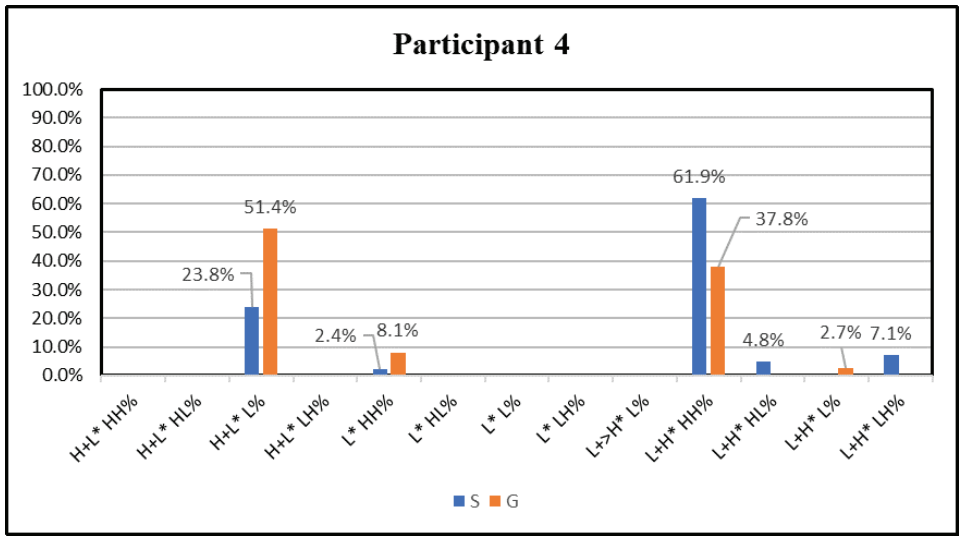


Figure D.4: Nuclear Configuration Distribution for Participant 4 (BLP: 80)

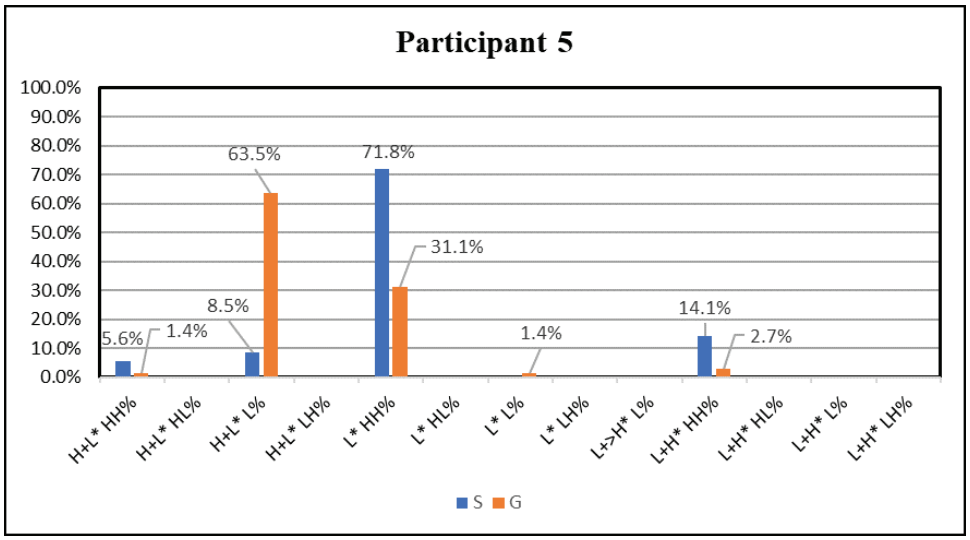


Figure D.5: Nuclear Configuration Distribution for Participant 5 (BLP: -59)

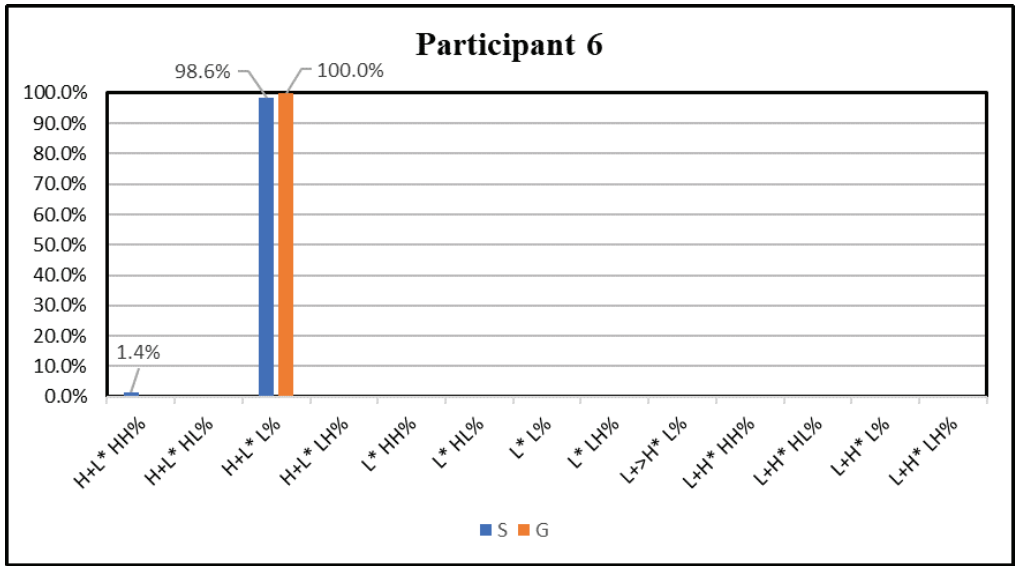


Figure D.6: Nuclear Configuration Distribution for Participant 6 (BLP: 58)

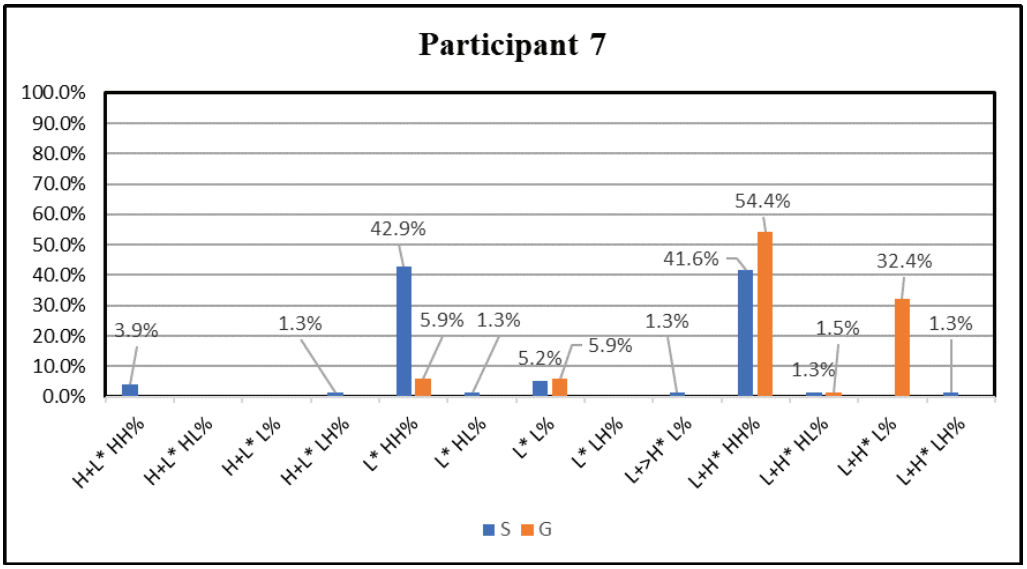


Figure D.7: Nuclear Configuration Distribution for Participant 7 (BLP: 42)

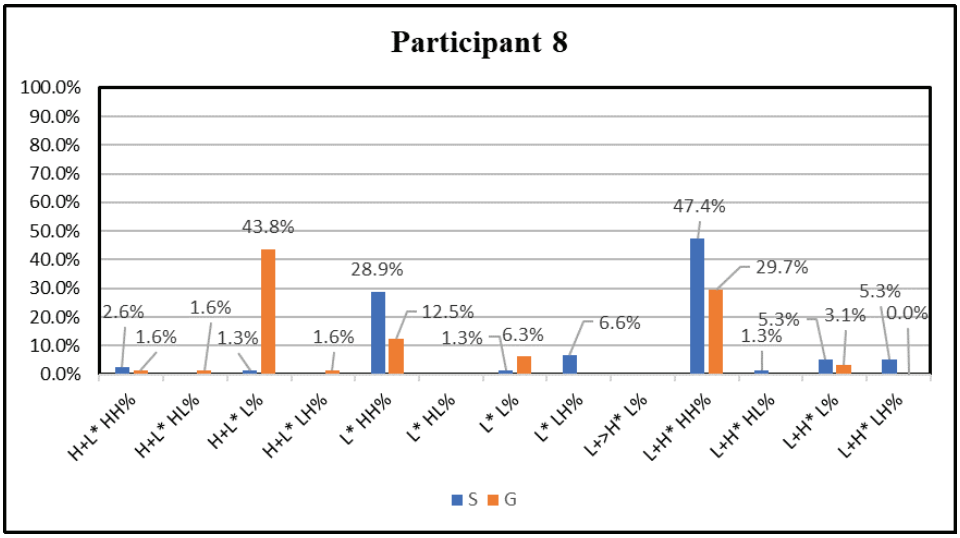


Figure D.8: Nuclear Configuration Distribution for Participant 8 (BLP: -11)

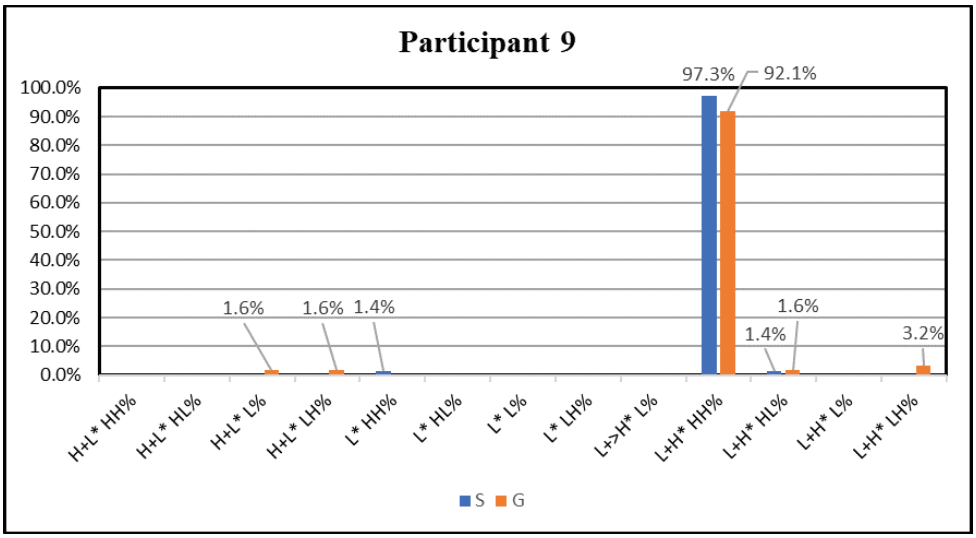


Figure D.9: Nuclear Configuration Distribution for Participant 9 (BLP: -11)

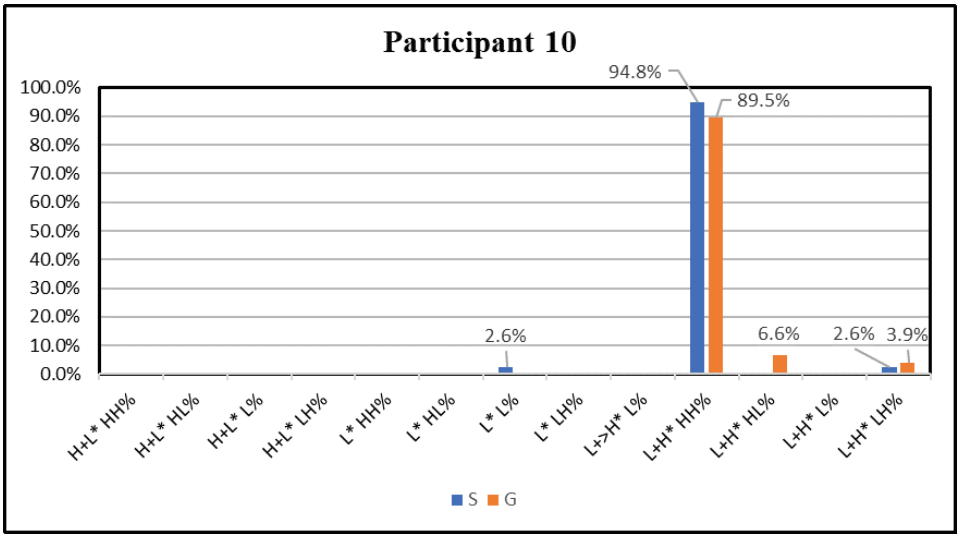


Figure D.10: Nuclear Configuration Distribution for Participant 10 (BLP: 13)

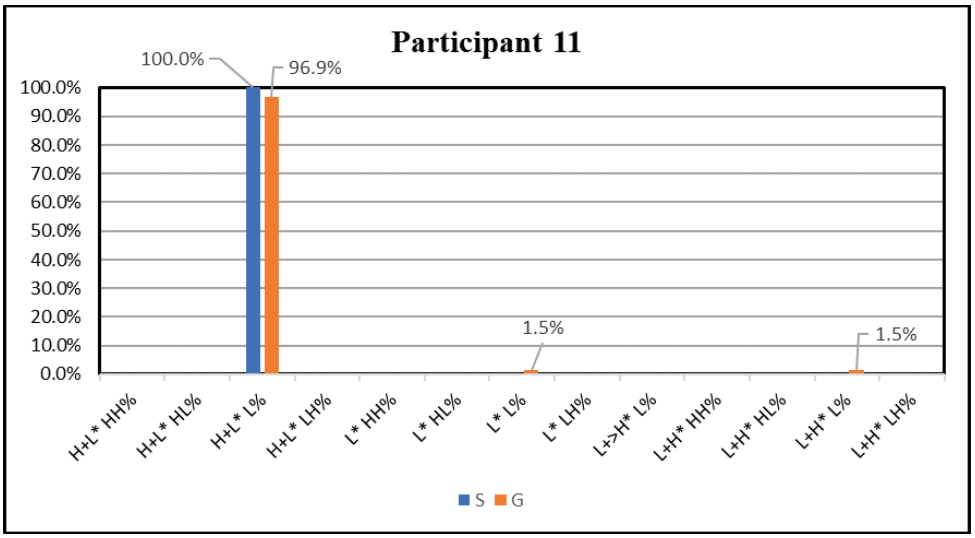


Figure D.11: Nuclear Configuration Distribution for Participant 11 (BLP: -41)

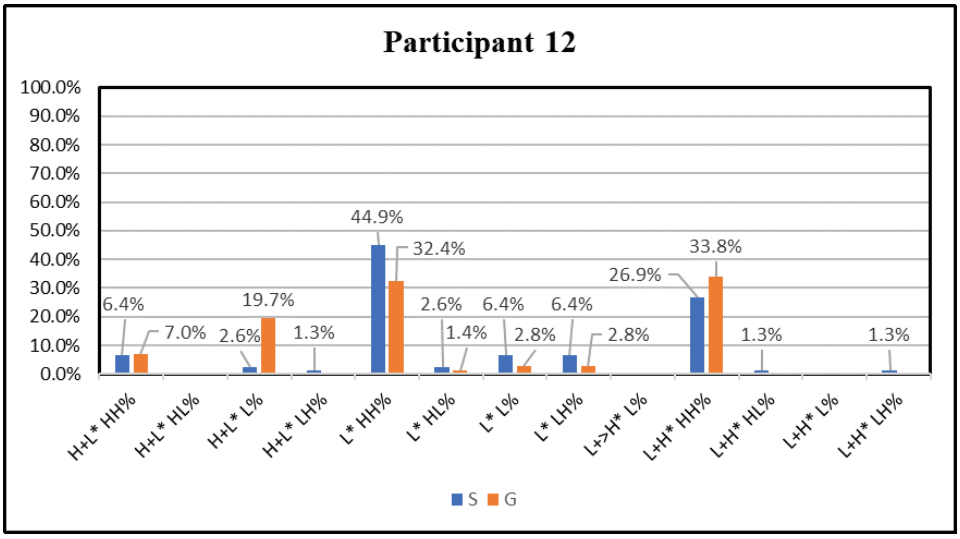


Figure D.12: Nuclear Configuration Distribution for Participant 12 (BLP: -35)

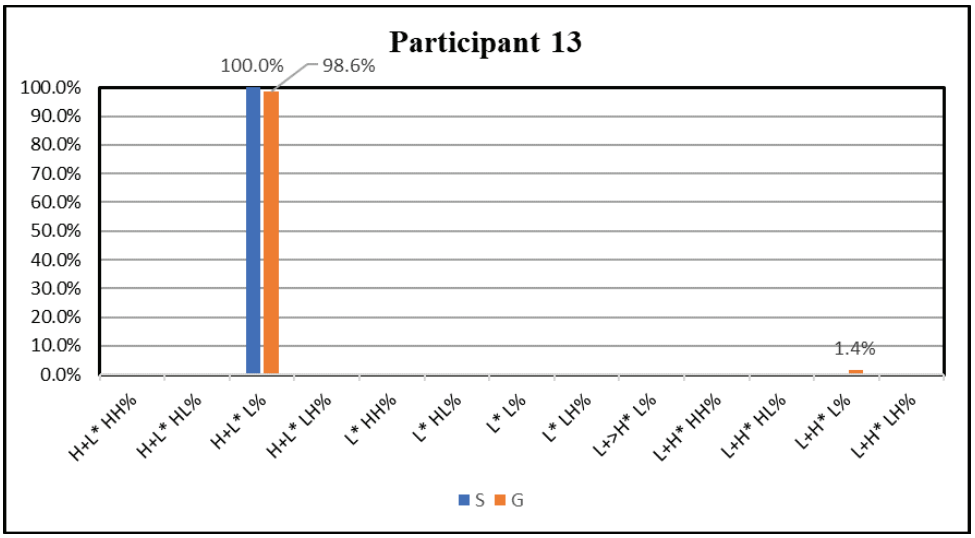


Figure D.13: Nuclear Configuration Distribution for Participant 13 (BLP: -11)

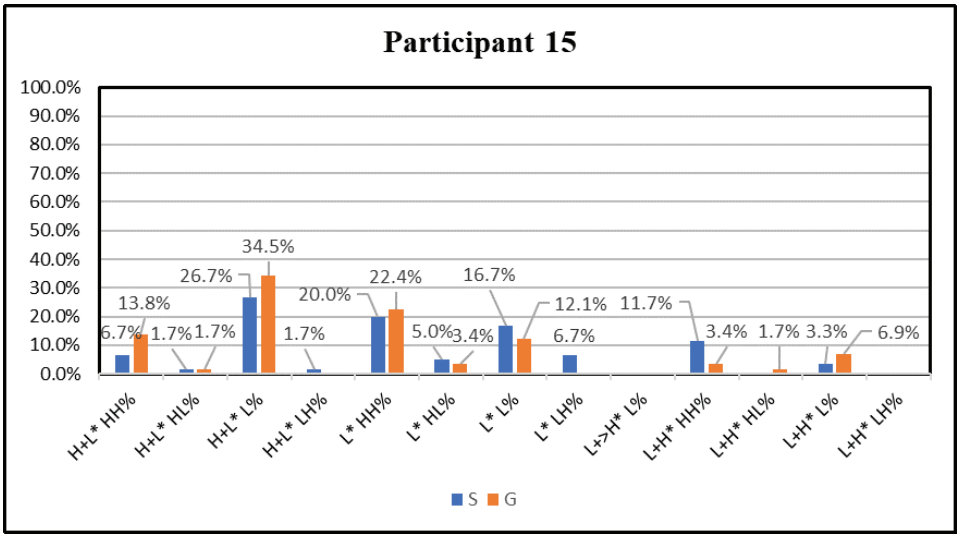


Figure D.14: Nuclear Configuration Distribution for Participant 15 (BLP: -67)

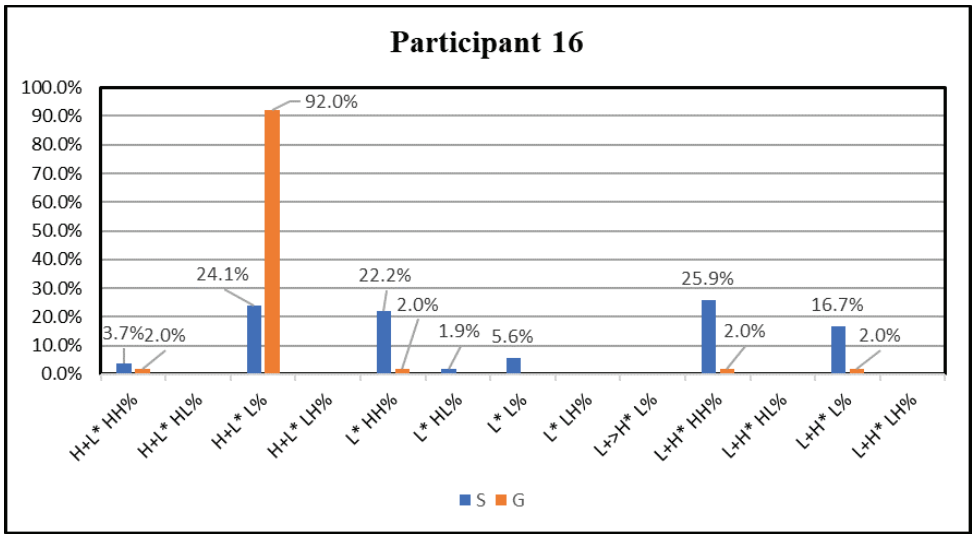


Figure D.15: Nuclear Configuration Distribution for Participant 16 (BLP: 83)

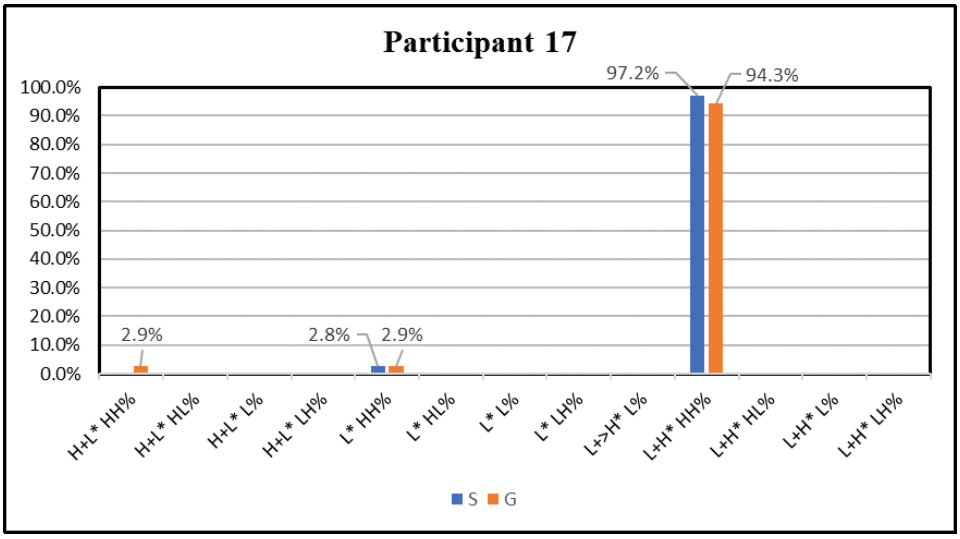


Figure D.16: Nuclear Configuration Distribution for Participant 17 (BLP: -34)

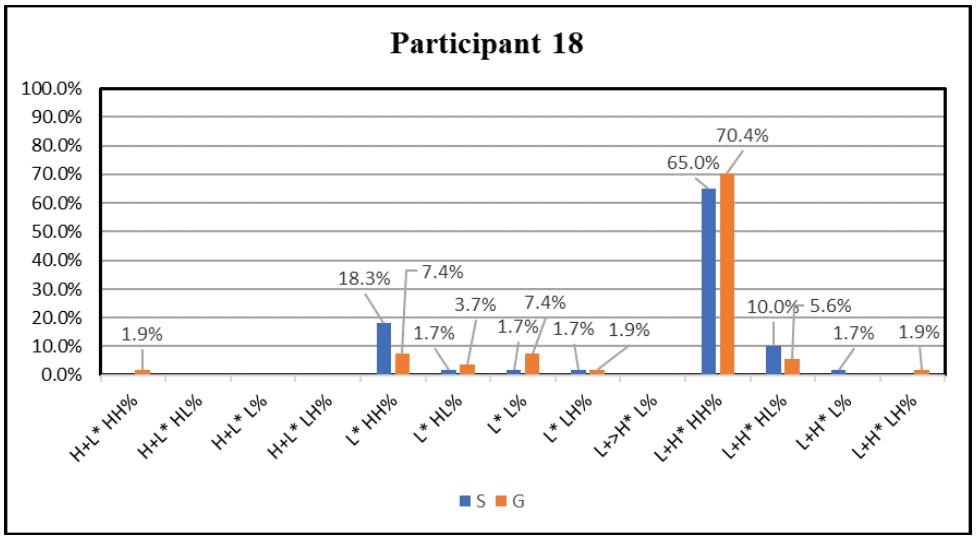


Figure D.17: Nuclear Configuration Distribution for Participant 18 (BLP: 114)

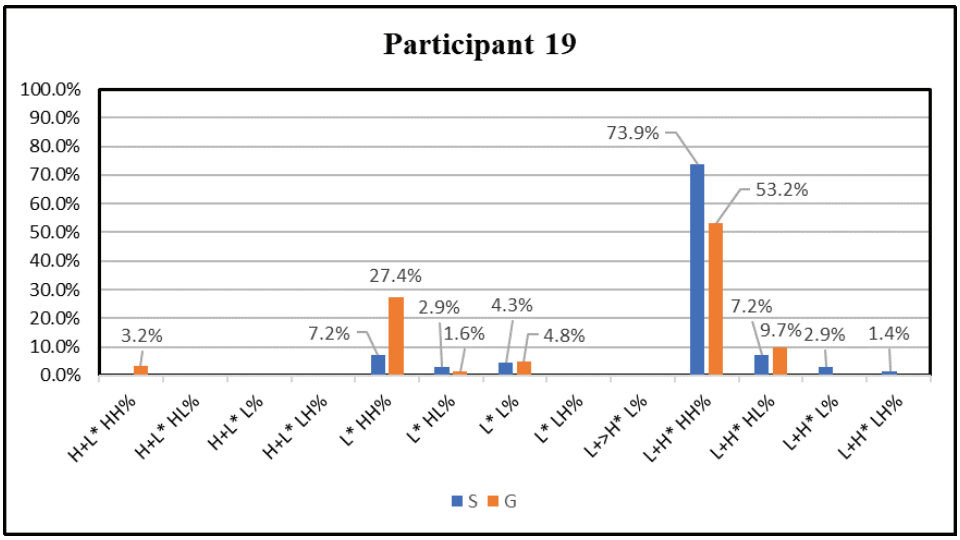


Figure D.18: Nuclear Configuration Distribution for Participant 19 (BLP: 82)

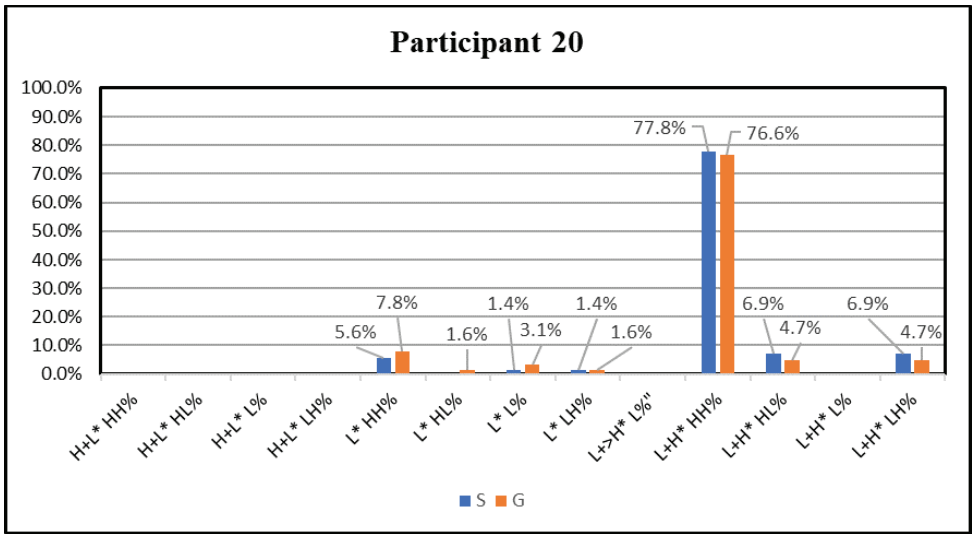


Figure D.19: Nuclear Configuration Distribution for Participant 20 (BLP: -81)

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