THE ACQUISITION OF THE SYNTACTIC AND MORPHOLOGICAL PROPERTIES
OF SPANISH IMPERATIVES IN HERITAGE AND SECOND LANGUAGE
SPEAKERS

by

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ABSTRACT OF THE DISSERTATION

The acquisition of the syntactic and morphological properties of Spanish imperatives in heritage and second language speakers

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Imperatives are one of the three major clause types of human language, along with declaratives and interrogatives (Aikhenvald, 2010; Alcázar & Saltarelli, 2014; Portner, 2016). Imperatives are usually employed to express commands, but they can convey other meanings such as entreaties, requests, advice or instructions (Aikhenvald, 2010). The current study investigates the acquisition of syntactic and morphological properties of imperatives in Spanish in order to test previous proposals on the order of acquisition of language components for L2 learners and heritage speakers. Moreover, this study examines whether the acquisition of this structure is modulated by extra-linguistic factors (e.g., proficiency in Spanish, age of onset of acquisition of Spanish and English, and patterns of language exposure and use) and by lexical frequency (i.e., how frequently a given lexical item appears in the input).
Previous proposals on the order of acquisition of language components in L2 learners agree on that morphology is the most challenging language component to acquire for L2 learners (Jiang, 2000; Lardiere, 2008, 2009; Slabakova, 2013). A similar focus on the difficulty to acquire morphology is found in proposals on heritage language acquisition and maintenance (Putnam & Sánchez, 2013). This study aims to test the validity of these proposals by examining the acquisition of imperatives in Spanish, which present a complex syntax and a relatively poor morphology (Alcázar & Saltarelli, 2013; Ezeizabarrena, 1997; Rivero & Terzi, 1995). Furthermore, this study also tests previous approaches that underline the importance of language activation in the acquisition of second and heritage languages (Gollan, Weissberger, Runnqvist, Montoya, & Cera, 2012; Paradis, 1993; Putnam & Sánchez) by examining the role of extra-linguistic factors that measure the activation of their non-dominant language, Spanish, throughout their lives. Along the lines of language activation, this study also investigates the effects of lexical frequency on the acquisition of morphology. Specifically, lexical frequency is used as a proxy for language activation: more frequent lexical items are more frequently activated in the bilingual mind for production and comprehension purposes (Putnam & Sánchez, 2013).

A group of L2 learners \((n = 51)\) and heritage speakers \((n = 58)\) of varied proficiency levels completed an elicited production task, an acceptability judgment task, and a self-reported lexical frequency test, as well as several screening tasks and tests. A group of 12 Spanish-dominant bilinguals and 20 Spanish instructors served as comparison groups for the heritage speakers and the L2 learners, respectively. The results, which are not consistent with previous second language proposals and hypotheses
(Jiang, 2000; Lardiere, 2008, 2009; Slabakova, 2013), show that L2 learners acquire some functional morphology, namely number morphology (e.g., ¡mira! ‘(singular you) Look!’ vs ¡miren! ‘(plural you) Look!’), which is less challenging than purely syntactic operations, as seen in clitic placement. The heritage speakers, on the other hand, present a more stable syntax than morphology, consistently with Putnam and Sánchez (2013). Additionally, language activation, as measured by proficiency and age of onset of acquisition of Spanish and English, has an effect on the acquisition of the properties under examination. On the other hand, patterns of language exposure and use, and lexical frequency (e.g., ¡mira! ‘Look!’ vs ¡cose! ‘Sew!’) only play a role in the acquisition of morphology in heritage speakers, but not in L2 learners. These findings support claims that heritage language activation is crucial for its acquisition and maintenance (Putnam & Sánchez, 2013) and that heritage speakers present differential access to their grammatical knowledge as a function of lexical frequency (Pérez-Cortés, Putnam, & Sánchez, 2019).

The contributions of this study are threefold: First, this is the first study that investigates the acquisition of Spanish imperatives in L2 learners and heritage speakers. Second, this study challenges previous literature (Lardiere, 2008, 2009; Slabakova, 2013, 2019) by finding that L2 learners acquire functional morphology earlier than a purely syntactic operation. Third, this is the first study that found lexical frequency effects in the acquisition of morphology with morphologically regular verbs in heritage speakers.

**Keywords:** imperative, heritage language, L2 Spanish, second language acquisition, morphology, lexical frequency
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Chapter 1

Introduction

In this chapter, I present the focus of the study as well as the contributions it aims to make in the fields of second language acquisition and heritage language acquisition and maintenance. Additionally, this chapter provides an outline of the other chapters of this dissertation.

1.1. Focus of the study

The present study examines the acquisition of Spanish imperatives among two groups of bilinguals: heritage speakers, “a student who is raised in a home where a non-English language is spoken, who speaks or merely understands a heritage language and who is to some degree bilingual in English in the heritage language” (Valdés, 2000, p. 1), and second language learners, who first started learning Spanish after puberty. Specifically, this study looks at the acquisition of a series of syntactic and morphological properties present in Spanish imperatives by English-speaking heritage speakers and second language learners and examines their pattern of acquisition, which may feature a specific order of acquisition of these properties as well as cross-linguistic influence from English into Spanish. Cross-linguistic influence has been defined as the adoption of previously learned patterns onto a less dominant language, which has an effect on the speaker’s linguistic performance or development (Gass & Selinker, 1994; Kellerman & Sharwook-Smith, 1986; Odlin, 1989; Pérez-Cortés, 2016). In English and Spanish, imperatives present different morphosyntactic properties. First, English imperatives are not morphologically marked for either person or number, whereas Spanish imperatives
mark person and number morphologically (Alcázar & Saltarelli, 2014; Ezeizabarrena, 1997). Second, Spanish imperatives feature a different verb paradigm when combined with negation, whereas English imperatives make use of do-support when combined with negation (Alcázar & Saltarelli, 2014; Harris, 1997, 1998; Rivero & Terzi, 1995).

Imperatives are one of the three major clause types of human language, along with declaratives and interrogatives (Aikhenvald, 2010; Alcázar & Saltarelli, 2014; Portner, 2016). Imperatives are usually employed to express commands, but they can convey other meanings such as entreaties, requests, advice or instructions (Aikhenvald, 2010). Additionally, most languages have a grammatical distinctive class of sentences associated with expressing commands (Portner, 2016). Rivero and Terzi (1995) and Alcázar and Saltarelli (2013) have developed syntactic accounts for some properties of imperatives in Spanish. The present study tests those syntactic accounts by examining the acquisition of some syntactic and morphological properties of imperatives in Spanish.

The acquisition of the Spanish imperative is still underexplored. It has been mostly examined in Spanish-speaking children in Spain, in both monolingual and bilingual contexts (Ezeizabarrena, 1997; Gathercole, Sebastián & Soto, 1999; 2002; Grinstead, 1998, 2000), with few exceptions discussing imperatives in child second language learners (Herschensohn, Stevenson, & Waltmunson, 2005). However, no studies have looked at the acquisition of the Spanish imperative in heritage speakers or adult second language learners. As Gathercole et al. (1999, 2002) discuss that the acquisition of imperatives is lexically driven in first language acquisition, this study investigates whether the acquisition of the properties under examination is modulated by how frequently the verb in the test item appears in the input.
The current study investigates the acquisition of syntactic and morphological properties present in imperatives in Spanish. Particularly, I examine the acquisition of several features (e.g., addressee, person, and number) and their morphological instantiation as well as the acquisition of movement in the CP layer of imperative clauses, and whether the acquisition of these properties presents a pattern of order of acquisition. Furthermore, this study investigates the impact of extra-linguistic factors, such as proficiency in Spanish, patterns of language use and exposure, and age of onset of acquisition of Spanish/English, on the participants’ production and receptive grammatical knowledge. Finally, the present study explores the role of lexical frequency in within-subject variability.

Extending previous work on second language acquisition (Jiang, 2000; Lardiere, 2008, 2009; Slabakova, 2013, 2019), I hypothesize that second language learners present a specific pattern of order of acquisition in which syntax is preceded by morphology across proficiency levels in spite of imperatives in Spanish presenting a complex syntax and relatively poor morphology (Ezeizabarren, 1997). Failing to find such acquisition pattern would present a challenge to second language acquisition proposals, which claim that morphology is the last language component to be acquired (Jiang, 2000; Lardiere, 2008, 2009; Slabakova, 2013, 2019). Following Putnam and Sánchez (2013), I hypothesize that heritage speakers present a variable morphology but a stable syntactic knowledge. Furthermore, I hypothesize that, as reported in previous studies (Cuza & Frank, 2015; Hyltenstam & Abrahamsson, 2003; Jia, 1998; Montrul, Foote, & Perpiñán, 2008a, 2008b), age of acquisition plays a role in the acquisition of morphosyntax. Finally, I hypothesize that the lexical frequency of the lexical item under examination
plays a role in the bilinguals’ performance, both production and receptive grammatical knowledge, of the morphosyntax of Spanish imperatives, as documented by previous research in second language speakers (Ellis & Collins, 2009) and heritage speakers (Giancaspro, 2017; Hur, forthcoming).

For the present study, I adopt two main theoretical accounts: on the one hand, I adopt Putnam and Sánchez’s (2013) activation approach to heritage language acquisition and maintenance for the group of heritage speakers; on the other hand, I adopt a combination of Jiang’s (2000) lexical representation and development in second language speakers and Lardière’s (2008, 2009) Feature Re-assembly Hypothesis for the group of second language learners. I integrate the two theoretical accounts for second language acquisition above by claiming that the acquisition of morphological specifications in the last stage of the developmental path established by Jiang (2000) is consistent with Lardière’s (2008, 2009) claims on the importance of the notion of lack of morphological competence in feature re-assembly processes among second language learners. Both theoretical accounts emphasize the difficulty that second language learners face when acquiring morphology in the second language.

Specifically, the variability found among the second language learners could be explained in terms of Jiang (2000), who argues that morphology is the last component to be acquired in lexical items. Therefore, it could be argued that Spanish learners have knowledge of the semantic and syntactic properties of the Spanish imperative but, regarding mapping such properties to morphology, they still show differences when compared to dominant Spanish speakers. Furthermore, these possible outcomes are consistent with those presented by Putnam and Sánchez’s (2013) activation approach for
heritage speakers. According to the authors, heritage speakers are prone to show differences with dominant Spanish speakers in their morphology when the activation of their heritage language is reduced. By using lexical items as a proxy for different levels of activation, this approach could account for within-subject variability due to lexical frequency among heritage speakers (Giancaspro, 2017; Hur, forthcoming).

To recapitulate, the contributions that this study aims to make are several: First, it is the first empirical study that investigates the acquisition of imperatives in Spanish among adult second language learners and heritage speakers and examines the order of acquisition across proficiency of several properties of Spanish imperatives in these two groups. Second, this is the first empirical study that tests Rivero and Terzi’s (1995) and Alcázar and Saltarelli’s (2013) syntactic accounts for imperatives by examining their acquisition in two groups non-dominant speakers of Spanish. Third, this study follows previous studies that found that within-subject variability in heritage speakers can be accounted for by examining lexical frequency effects (Giancaspro, 2017; Hur, forthcoming). Lexical frequency is used as a proxy for frequency of activation in heritage language acquisition and maintenance (Putnam & Sánchez, 2013).

1.2. Organization of the chapters

The dissertation is organized as follows: Chapter 2 examines the theoretical background of the syntactic and morphological properties of imperatives, with a special attention to aspects in which English and Spanish differ: the instantiation of number and social distance in the subject-verb agreement verb morphology, as well as the use of a surrogate or suppletive form when there is a negation phrase in the imperative clause. It also presents the relationship between clitic placement in imperatives and the presence of
a negation phrase. Chapter 3 reviews previous proposals on the acquisition of syntax and morphology in second language learners and heritage speakers, as well as literature on the acquisition of imperatives in Spanish. This chapter also discusses the role of lexical frequency in second and heritage language acquisition. Chapter 4 introduces the research questions and hypotheses that guide the study. The research questions investigate whether second language learners and heritage speakers present a pattern of order of acquisition of the syntactic and morphological properties of Spanish imperatives under examination. Furthermore, the study examines what impact lexical frequency has on their performance and the role of extra-linguistic factors (e.g., proficiency in Spanish, language use and exposure, age of onset of acquisition) in their knowledge of such properties. Chapter 4 also presents the methodology used in this study. Chapter 5 introduces the results provided by the experimental study. Following this chapter, Chapter 6 presents a discussion on the findings of the study. Finally, Chapter 7 provides a conclusion for the dissertation and addresses the limitations of the study as well as opportunities for further research.
Chapter 2

The morphosyntactic properties of imperatives

2.1. Theoretical perspectives on the morphosyntactic properties of imperatives

2.1.1. What are imperatives?

Imperatives are one of the major clause types of human language; indeed, most languages have a grammatical distinctive class of sentences associated with directive meaning (Portner, 2016). Alcázar and Saltarelli (2014) argue that the imperative clause is one of the three basic sentence types (Sadock & Zwicky, 1985) along with the declarative and interrogative sentence types. Each of those three sentence types differs in its prototypical communicative function: usually, imperative sentences convey orders, declarative sentences express statements, while the communicative function of interrogative sentences is to pose a question (Alcázar & Saltarelli, 2014). In English, imperatives are morphosyntactically distinctive because they lack an overt subject and their verb morphology is simply the verb stem (see example 1 below) (Portner, 2016). Also, the directive meaning conveyed by imperatives may be expressed by other clause types in English (see examples 2 and 3) (Portner, 2016; Truckenbrodt, 2006).

(1) Imperative sentence: Write that paper!
(2) Declarative sentence: You write that paper.
(3) Interrogative sentence: Will you write that paper?

Imperatives and commands do not refer to the same thing. Aikhenvald (2010) points out that imperatives are a category in the language, whereas commands refer to the meaning or the communicative function that imperatives can express. Aikhenvald (2010) continues explaining that it is not uncommon for a category in the language to have a
counterpart in the meaning or communicative function. That is the case for ‘time’ in meaning, which translates into ‘tense’ in terms of categories in the language: ‘tense’ is a grammaticalized set of forms we use in a language to express time. In other words, tense, the language category, restricts the possibilities to express time. Similarly, imperatives restrict the possibilities to express commands, as the possibilities for commands are extensive, while the possibilities of expressing imperatives across the languages of the world are limited (Aikhenvald, 2010).

Imperatives convey commands par excellence (Aikhenvald, 2010). Indeed, Portner (2016) argues that imperatives are the only grammatical distinctive class associated with directive meaning across languages. However, imperatives and commands do not always match. Indeed, imperatives can be used for more than expressing commands. For instance, imperatives can express several meanings, such as entreaties (Please let me go to the party!, ¡Déjame ir a la fiesta, por favor!), requests (Print these forms for me, Imprímeme estos formularios), advice (Drive carefully!, ¡Conduce con cuidado!), and instructions (Turn left after the light, Gira a la izquierda después del semáforo), among others (Aikhenvald, 2010). On the other hand, commands can be expressed with other language categories other than imperatives, such as declaratives (You behave or we are leaving, Te portas o nos vamos) or interrogative sentences (Will you be quiet?, ¿Te quieres callar?), among other (Aikhenvald, 2010; Huddleston, 2002). Consistently, Portner (2016) points out that declarative and interrogative sentences can convey a directive meaning in certain contexts, although imperative sentences can never assert or ask for information as declarative and interrogative sentences can.
This section has defined that imperatives are a morphosyntactically distinctive form that encodes a myriad of different communicative functions. This dissertation study examines the acquisition of imperatives, specifically those imperatives that convey commands. Particularly, it looks at the acquisition of syntactic features in Spanish imperatives among heritage speakers and second language learners.

2.1.2. Generalizations on imperatives across languages

This section describes a series of generalizations concerning imperative clauses and their syntactic properties. These generalizations have been studied across languages. First, this section introduces the generalizations that have been confirmed, followed by those that still need to be reviewed. Such generalizations are the peculiarities that make imperative clauses distinguishable from declaratives and interrogatives. These generalizations are either syntactic or semantic in nature.

The first confirmed generalization concerning imperative clauses that occurs across languages is that imperative clauses are one of the three basic sentence types along with declarative and interrogative clauses (Alcázar & Saltarelli, 2014; Sadock & Zwicky, 1985). In other words, imperative clauses are universal and exist across languages. They are different from declaratives and interrogatives in terms of semantics and syntax.

Imperative clauses, particularly those that convey commands, are semantically restricted by the type of predicate that they can select (Alcázar & Saltarelli, 2014). Birjulin and Xrakovskij (2001, p. 17) claim that imperatives “must denote controllable actions, i.e. actions which, in a given situation, can be performed (or not performed) in a controlled manner by any given person based on his/her own or somebody else’s experience”. See the contrast below:
(4) Listen to me!

(5) *Hear me!

In the examples above, (5) does not denote a controllable action that can be deliberately carried out, as opposed to (4). Specifically, the addressee in (4) is in control of the action and, therefore, may obey the command directed to them. On the other hand, the verb hear in (5) is not a controllable action, which makes (5) an infelicitous directive. Overall, stative predicates, non-volitive predicates, and inanimate addressees cannot participate in imperative clauses (Alcázar & Saltarelli, 2014).

Subjects in imperative clauses seem to be optional even in languages that ordinarily need to express it (Alcázar & Saltarelli, 2014). Postdam (1998) claims that subject realization in imperative clauses responds to pragmatic factors, a view which is consistent with Aikhenvald (2010, p. 93). Furthermore, Aikhenvald (2010) states that this optionality occurs irrespectively of whether or not the language in question is pro-drop. On the other hand, Birjulin and Xrakovskij (2001, p. 11) consider that such pro-drop optionality is frequent but not universal.

Subjects in imperative clauses can be distinguished from the vocatives that occur along with them (Alcázar & Saltarelli, 2014). For instance, vocatives can refer to the addressee of an imperative clause while subjects of imperative clauses can refer to both the speaker and the addressee. This can be seen in (6) below:

(6) ¡Niño, vámonos de aquí!

Indeed, subjects and vocatives do not take the same syntactic position: subjects are found in the left periphery (right if it is a head-final language) and are undetachable (7a vs. 7b), while vocatives are noun phrases that occupy a detachable position in the clause to the
left or the right of the clause (7c and 7d). Additionally, vocatives are not exclusive to imperatives; they occur in declaratives and interrogatives and they do not occupy the subject position in them (7e).

(7)  
   a. You have been quite helpful.
   b. *You, have been quite helpful.
   c. Fulano, listen to me!
   d. Listen to me, Fulano!
   e. Fulano, is your father home?

The following generalizations are still in need of review. As the confirmed generalizations presented above, these are mostly syntactic. These generalizations also make imperative clauses distinguishable from declaratives and interrogatives.

Imperative verb forms are characterized by having bare or minimally inflected forms; for instance, they may be construed with a plain verb stem followed by an additional morpheme, such as a thematic consonant/vowel, an infinitival marker or an aspect morpheme (Alcázar & Saltarelli, 2014). Nevertheless, there exist several counterexamples to this view, as imperative verb forms can also be the most complex verb form in the language (Alcázar & Saltarelli, 2014; Birjulin & Xrakovskij, 2001). This is the case for Nivkh (Gruzdeva, 2001), Klamath (Stegnij, 2001), and Mongolian (Kuzmenkov, 2001). For instance, Kuzmenkov (2001, p. 98) claims “Mongolian verbs have no personal endings, but imperative verb forms appearing in various combinations do correlate with the person, and partially, number of the subject”, as shown in (8) below. Additionally, certain languages show an alternative verb paradigm for imperatives when they are combined with negation.
Another characteristic of imperatives clauses and verb forms for which counterexamples have been found is their lack of tense (Alcázar & Saltarelli, 2014). Imperatives are believed to be tenseless structures or tenseless verb forms (Beukema & Coopmans, 1989; Zanuttini, 1996). However, this generalization has been questioned by the future tense marking in Latin, which has also been found across languages of the Americas (Aikhenvald, 2010). Furthermore, although it is not as frequent, in Spanish as well as in other languages (Aikhenvald, 2010), there exists a counterfactual past imperative which encodes a past reference, as pointed out by Bosque (1980) (¡Haberlo hecho antes! [have.INF-it do.PART] ‘You should have done it before’). However, a true imperative past does not seem to be attested.

In summary, previous research claims that imperative clauses, or imperative verb forms in particular, cannot encode certain features (Alcázar & Saltarelli, 2014), such as tense (Zanuttini, 1996) or mood (Zanuttini, 1997). Nevertheless, as explained above, tense can surface in imperatives, as well as other categories, such as verbal agreement in person, number, and case. Additionally, Aikhenvald (2010) notes that imperatives in some languages express evidentiality, reported information, and a form of indexical category referred to by Aikhenvald (2010) as distal. Aikhenvald (2010) also claims that negative imperatives tend to show a paradigmatic reduction for a multitude of categories, such as tense, aspect, person, number, distance in space and directionality, and modality, among others. In the case of some languages including Spanish, imperative verb forms
are not compatible with negation, which results in the use of a surrogate or suppletive form in negative imperative clauses (e.g., *¡No salta! vs ¡No saltes! ‘Do not jump!’). These languages displaying imperative verb forms that are not compatible with negation have been denominated as Class I languages (Rivero & Terzi, 1995) (see 2.1.3.1). In Romance languages including Spanish, Portuguese, Romanian, the surrogate or suppletive form used in negative imperative clauses is the present subjunctive, as well as in Greek (Isac, 2015). In Italian, the surrogate form is the infinitive (Zanuttini, 1996). This phenomenon, however, is not restricted to Indo-European languages, as it appears in other language families: Bantu (Buell, 2002; Ngonyani, 2013), Semitic and Uralic languages (Zeijlstra, 2006).

In this section, I have discussed several syntactic characteristics that define imperatives and distinguish them from declaratives and interrogatives. These characteristics are generalizations that occur in imperatives across languages. Some of those generalizations have been confirmed, while others are still under review or contested by recently found counterexamples. The sections below present an overview of the syntax of imperatives in Spanish. In this dissertation, I examine the acquisition of Spanish imperatives in second language learners and heritage speakers.

2.1.3. An overview of the syntax of imperatives

This section presents some theoretical perspectives that attempt to account for the syntactic uniqueness of imperatives in opposition to declaratives and interrogatives. Several views regarding the syntax of imperatives have been proposed. In this section, I will discuss two: V-movement and logical mood in imperatives (Rivero & Terzi, 1995) and the Light Performative Hypothesis (Alcázar & Saltarelli, 2014). Rivero and Terzi
propose the existence of an imperative mood operator in the CP layer. This mood operator presents imperative logical mood features that need to be checked for the clause to have a directive meaning. Logical mood refers to the main function of a sentence, and, according to their logical mood, also referred to as illocutionary act, sentences can be categorized as assertives, directives, commissives, expressives, and declarations (Granström, 2011; Searle, 1979).

2.1.3.1. Rivero and Terzi’s V-movement and logical mood in imperatives

Rivero and Terzi (1995) account for the unique syntactic properties of Imperative Vs by proposing an imperative mood operator in the CP layer. First, the authors make a distinction between two classes of Imperative Vs: Class I Imperative Vs, which have unique syntactic properties that distinguish them from other verb forms, and Class II Imperative Vs, which lack such unique syntactic properties and, therefore, their syntax is similar to that shown in other verb forms, such as, in the case of Spanish, subjunctive verb forms. The authors argue that this syntactic distinction is attested in the morphology, as Class I Imperative Vs displays a morphology unique to the imperative, whereas Class II Imperative Vs show verb morphology that overlaps with that of other paradigms. Such distinctive imperative morphology is what allows Class I Imperative Vs to check the imperative logical mood features in the CP layer, resulting in the raise of Class I Imperative Vs in opposition to Class II Imperative Vs. Specifically, for Class I Imperative Vs, such as Spanish, Rivero and Terzi (1995, p. 302) claim that “imperative Vs have a syntactic distribution not shared by other verbs because the root C has a V-feature with imperative logical mood, which in minimalist terms (Chomsky, 1993), is STRONG”. This strong feature in the CP layer causes the overt raising of the Class I
Imperative V to the C hosting the imperative logical mood feature to check or license it.

Figure 1 below shows Rivero and Terzi’s (1995) simplified syntactic analysis of Imperative Vs, which does not include the operator or the features.

![Syntax of Imperatives Vs under Rivero and Terzi (1995)](image)

Unlike Class I Imperative Vs, Class II Imperative Vs do not raise to C to check or license its features. Instead, they remain in the IP, as the rest of verbs belonging to other verb paradigms. This syntactic distinction between Class I and Class II Imperative Vs results in different morphosyntactic properties, particularly when combined with negation or clitics. For instance, some distinctive syntactic properties associated with the Class I imperative Vs are the following:

(9) Its morphology cannot be negated.

(9a) ¡Lee!
Read-IMPERATIVE-2sg
‘Read!’

(9b) *¡No lee!
Not read-IMPERATIVE-2sg
‘Do not read!’
(10) It only accepts enclitic pronouns:

(10a) ¡Léelo!

Read-IMPERATIVE-2sg Clitic

‘Read it!’

(10b) *¡Lo lee!

Clitic Read-IMPERATIVE-2sg

‘Read it!’

These properties are the result of the Class I Imperative V raising to C to check or license the imperative logical mood features. Such movement is blocked by the negation when it is present in the imperative clause of Class I Imperative Vs. Figure 2 shows how negation blocks V-motion.

Figure 2: Class I Imperative V movement blocked by NegP (Rivero & Terzi, 1995)

In the scenario above, given that the movement of Class I Imperative V is blocked, Class I languages make use of alternative verb paradigms that are not Imperative Vs; in other words, other verbs that do not belong to the imperative verb paradigm. In the case of Spanish, the alternative verb paradigm that is employed is the subjunctive (Ezeizabarrena, 1997; Harris, 1997, 1998).

(11) ¡No leas!

Not read-SUBJUNCTIVE-2sg

‘Do not read!’
A previous version of the analysis shown above is presented in Rivero (1994). Although originally conceived for Balkan languages, Rivero’s (1994) analysis applies to imperatives in Spanish also. In her analysis, the CP dominates a Modal Phrase (MP), headed by an uninflected particle. The MP dominates the Tense/Agreement complex, which takes a VP as a complement.

![Clause structure analysis for languages of the Balkans (Rivero, 1994)](image)

On the other hand, clitics occur in enclitic or post-verbal position in Class I Imperative Vs due to the V-movement towards the CP layer. The Imperative V bypasses the clitic, which results in a V Cl order. This phenomenon is shown in Figure 4 below.

![Class I Imperative V movement bypassing clitic raising (Rivero & Terzi, 1995)](image)
However, this phenomenon does not occur if a negation blocks the Class I Imperative V movement. If the Class I Imperative V cannot move to the CP layer, a different verb form will be used instead, and the syntactic features of such verb form will apply. For instance, in Spanish, the present subjunctive is the verb paradigm used in imperative clauses when combined with a negative phrase in the IP. In that case, as it occurs with other finite verb forms in Spanish, clitics climb to a pre-verbal position as proclitics. Therefore, the imperative clause presents a Cl V order.

(12) ¡No lo leas!

Not Cl Read-PRES-SUBJUNCTIVE-2sg

‘Do not read it!’

(13) *¡No léaslo!

Not Cl Read-PRES-SUBJUNCTIVE-2sg

‘Do not read it!’

As Figure 3 above, which provides an analysis of canonical imperatives, Rivero (1994) also presents a detailed analysis of the structures of imperatives and other clauses in the languages of the Balkans in which the negative phrase and clitics are included. A canonical imperative is an affirmative command addressed to a second person, also referred to as the prototypical command (Aikhenvald, 2010; Sadock & Zwicky, 1985).
Figure 5: Clause structure analysis with negative phrase and clitic for languages of the Balkans (Rivero, 1994)

In this analysis, the CP dominates the negative phrase, and the MP dominates the Tense/Agreement Phrase, which can be headed by a clitic. In the languages of the Balkans as in Spanish, this analysis accounts for the clitic-verb order in negative imperatives, as opposed to canonical imperatives.

On the other hand, Class II Imperative Vs do not raise to check or license the imperative logical mood features in C root. Rivero and Terzi (1995) argue that Class II Imperative Vs do not show unique imperative morphology that carries intrinsic imperative logical mood, as Class II Imperative V morphology is shared by other verb paradigms in their languages. The Serbo-Croatian examples below (14, 15 and 16) featuring imperative and present tense declarative clauses do not share the same verb
form but show that imperatives and other verb forms share the same syntactic features regarding negation (15) and clitic position (16) in Class II languages.

(14) a. Čitajte!
    read.IMP:2PL
    ‘You (PL) read!’

b. Čitate.
    read.PRES:2PL

(15) a. Ne čitajte!
    NEG read.IMP:2PL
    ‘Do not read (You PL)!’

b. Ne čitate.
    NEG read.PRES:2PL
    ‘You (PL) are not reading.’

(16) a. Čitajte je!
    read.IMP:2PL
    ‘You (PL) read it!’

b. Čitate je.
    read.PRES:2PL it
    ‘You are reading it.’

This consistency in syntactic features between imperative verb forms and other verb forms stem from the fact that Class II Imperative Vs remain in the IP. Given that Class II Imperative Vs remain in the IP and do not raise to the CP layer, their syntactic properties are not any different than those shown by other verb paradigms. On the other
hand, English imperatives, unlike Spanish imperatives, seem to follow the same pattern as Class II imperative Vs. Imperative Vs in English make use of *do*-support when combined with negation. However, this phenomenon is not exclusive to imperatives in English:

(17) 

a. Run!

run.bareform

‘(You) Run!’

b. You run.

You run.bareform

(18) 

a. Do not run!

DO-support NEG run.bareform

‘Do not read (You PL)!’

b. You do not run.

You DO-support NEG run.bareform

‘You do not run.’

In English, imperative and present verb forms share morphology and syntactic properties. However, English features only overt subjects with all verb forms except in imperatives, while Serbo-Croatian features null subjects in both present and imperative verb forms.

Rivero and Terzi (1995) provide an analysis of imperatives in Class I languages, which feature a different verb paradigm in their negative imperatives, as opposed to Class II languages, which use the same imperative verb form regardless of the presence of a negative phrase. They account for the use of a surrogate form in Class I languages by
claiming that the negative phrase blocks the raising of the verb to the CP layer, whereas imperative verbs in Class II languages always remain below the CP regardless of the presence of a negative phrase.

2.1.3.2. Alcázar and Saltarelli’s Light Performative Hypothesis

Alcázar and Saltarelli (2014) propose the Light Performative Hypothesis (LPH), which claims that imperatives are unique and different from declaratives and interrogatives in that they have a functional ‘light’ v in the head of the v’. This ‘light’ v is an auxiliary-like verb that gives imperatives their directive meaning, as it functions as a “prescription”. Specifically, “this light performative v projects aspect and even information encoding the Speaker and . . . differs in argument structure from lexical verbs V, with which they form a syntactically complex predicate” (p. 192). Additionally, the authors attend to the conceptual necessity of encoding the indexical properties of the context for an appropriate description of the syntax of imperative clauses by including indexical phenomena such as tense and participant roles (e.g., speaker, addressee, and performer) in the specifiers of two VPs as shown in the figure below. Also, Illocutionary Force (IF) is located in the specifier of CP, where it can be valued by dedicated imperative forms, which are those verb forms that are exclusively imperative (e.g., ¡come (tú)! ‘(singular you) eat!’ or ¡comed (vosotros)! ‘(plural you) eat!’ in Spanish).
The authors’ proposal on the relation between speaker and addressee is based on Reichenbach’s (1947, p. 118-119) principles of referential irreflexivity and structural asymmetry. These principles state that imperatives exclude self-ascription and that the addressee is referentially disjoint from the speaker, respectively. The authors claim that “A function \( f \) is called irreflexive if \( (x) f(x, x) \) is always false, . . . an asymmetrical function, i.e., a function which, when it holds between two arguments, excludes the validity of its converse (Allwood, Andersson, & Dahl, 1995, p. 8)” (p. 194).

\[
\forall x \sim R(x, x) \quad \text{irreflexive}
\]

\[
\forall x \ y \ (R(x, y) \rightarrow \sim (R(y, x))) \quad \text{asymmetric}
\]

Figure 6: Alcázar and Saltarelli’s (2014) canonical imperative syntax under the LPH

Via these principles, person values in imperatives fall into two sets: 1\text{st} person (speaker) and 2\text{nd} person (addressee) vs. 3\text{rd} person. Specifically, this proposal considers
the speaker (A), the addressee (B), and the performer (C), which can be referentially disjoint from the addressee and result in extended (hortative) imperatives as opposed to canonical imperatives, in which the addressee and the performer are the same referent. In canonical imperatives, only the 1st person (speaker) and the 2nd person (addressee) are involved, while the performer is different from the addressee in extended (hortative) imperative clauses. Figure 8 below shows Alcázar and Saltarelli’s (2014) analysis of extended (hortative) imperative clauses.

A = Speaker; B = Addressee; C = Performer

Figure 8: Alcázar and Saltarelli’s (2014) extended imperative syntax under the LPH

Alcázar and Saltarelli extend their proposal to negative imperatives. The authors claim that negation can select for different verb forms. Specifically, negations can (a) be dedicated to imperatives (e.g., Latin nē for commands and nōn for statements), (b) select different moods, such as subjunctive (e.g., Spanish) or indicative (e.g., Italian), or (c) be construed with an auxiliary verb or a main V verb (e.g., English). From a computational
perspective, LPH derives imperatives and prohibitions following the same operation Head-move or Merge. On the other hand, the indexical meaning of the imperative clause can be defined as {Speaker uttering a “prescription” to an Addressee}. Therefore, prescriptions can be compositionally negated just like statements. Structurally, the negation should be located higher than v, but lower than the function C. Figure 9 below shows a comparison between the syntax of canonical imperatives and prohibitions in Spanish under the LPH. In Spanish canonical imperatives, the dedicated verb form values the IF. On the other hand, in Spanish prohibitions, the negation occupies a higher position than the prescription. Specifically, the negation alone (+ the surrogate verb form, subjunctive in the case of Spanish) values the prohibitive features in the CP layer.

a. Imperative
b. Prohibition

![Diagram of Alcázar and Saltarelli’s (2014) negative imperative syntax in Spanish under the LPH]

To sum up, the authors conclude that the imperative-prohibition system under LPH share the same thematic relation between Speaker (A) and Addressee (B), as well as sentential force C. Additionally, Illocutionary Force (IF) is located in the CP layer for both imperatives and prohibitions. In turn, v projects an external argument with the role of Speaker and selects a vP (the “prescription”). Such vP projects an external argument that is assigned the role of Addressee as a result of the defining referential irreflexivity relation between Speaker and Addressee in imperative expressions.

2.1.3.3. Summary

The two proposals exposed above have a series of converging and diverging points. In this summary, I will discuss such similarities and differences regarding the areas of interest in this study. Specifically, I will compare the proposals in how they account for the differences between Class I and Class II imperative verbs, for the use of a
surrogate or suppletive form in negative imperatives, and for the representation of the syntactic features of the addressee or subject of imperative clauses.

Both proposals claim that there exists a syntactic operator (e.g., imperative mood operator, Rivero & Terzi, 1995; imperative operator containing illocutionary force features, Alcázar & Saltarelli, 2014) derived from the pragmatic-semantic features of clauses conveying directive meaning. Both Rivero and Terzi (1995) and Alcázar and Saltarelli (2014) claim that verbs with imperative morphology are raised to check imperative features in the CP. On the other hand, Rivero and Terzi (1995) and Alcázar and Saltarelli (2014) claim that the difference between Class I and Class II imperative verbs is that the former raise in order to check imperative features in the CP layer, whereas the latter remain at a lower level. Specifically, under Rivero and Terzi (1995), Class II imperative verbs check the features of the Inflectional Phrase, while, under Alcázar and Saltarelli (2014), all lexical verbs V form a complex predicate with the light performative v in which v projects aspect and event information. Class I imperative verbs can be prevented from raising to the CP layer due to a negative phrase blocking the verb raise, which results in the use of surrogate or suppletive verb forms. Finally, the two proposals differ in their views regarding the syntactic features of the addressee. First, Rivero and Terzi (1995) do not cover the syntactic properties assigned to the speaker or the addressee of imperative clauses. Instead, they treat imperative clauses as any other type of clause except for their logical mood operator in the CP layer in which the imperative features are positioned. However, Alcázar and Saltarelli (2014) do include both Speaker and Addressee in their syntactic analysis of imperatives. Their analysis also points out that the addressee in imperative clauses can be either singular or plural in
addition to carrying 2\textsuperscript{nd} person features and nominative case. No proposal has considered the formality or social distance (Brown & Levinson, 1987) incorporated in pronominal systems (Bembridge & Peters, 2018) (e.g., ‘tú’ vs. ‘usted’ in Spanish or ‘tu’ vs. ‘Lei’ in Italian) as part of their analyses. Aikhenvald (2010), nevertheless, discusses that imperatives can carry the feature distal.

In conclusion, all two proposals are different in the aspects discussed above. Both of them argue for the existence of an operator in the CP layer that gives imperative clauses its unique morphosyntactic properties. Furthermore, they account for the occurrence of surrogate or suppletive verbs in imperatives differently; Rivero and Terzi (1995) claim it is related to verb morphology issues, while and Alcázar and Saltarelli (2014) link it to the morphological selection of the negative phrase. Finally, Alcázar and Saltarelli (2014) assign a syntactic position to the speaker and the addressee of the speech act, especially to the addressee, which carries 2\textsuperscript{nd} person features, nominative case, and number.

In this dissertation study, I adopt a combined approach to the analysis of imperatives in Spanish. Regarding the examination of the acquisition of surrogate or suppletive forms in negative imperatives and clitic placement, I assume Rivero and Terzi’s (1995) syntactic analysis. For the acquisition of subject-verb agreement morphology in which the subject of the imperative is the addressee, I adopt Alcázar and Saltarelli’s (2014) more detailed view on the syntactic properties of the addressee. Next section elaborates on the features that can be encoded in subject-verb agreement morphology in Spanish verb forms.
2.2. Clitics in Spanish imperatives

In Spanish, clitic object pronouns are unstressed object pronouns which rely on a verb host syntactically and phonologically. Their distribution -whether they appear in their overt or null form- depends on two semantic features of the antecedent to which they refer: definiteness and specificity (Campos, 1986, Clements, 1994, 2006; Sánchez, 1999). While definiteness makes reference to whether the antecedent is known or identifiable by the speaker or hearer (Givon, 1978), specificity alludes to the referentiality of the antecedent in the discourse. In Spanish, clitics referring to definite antecedents appear in their overt form (19a, 19b), while clitics referring to indefinite non-specific antecedents appear as null clitics (19c) (Campos, 1986, Clements, 1994, 2006; Sánchez, 1999), as shown in the examples below:

(19)  
a. Clitic with a definite specific antecedent:

_No leí el libro porque no_ lo _encontré._

‘I did not read the book because I did not find it.’

b. Clitic with a definite non-specific antecedent:

_¿Has probado la leche de soja alguna vez?_

_No, nunca_ la _he probado._

‘Have you ever tried soy milk?

No, I have never tried it.’

c. Clitic with an indefinite non-specific antecedent:

_¿Quieres té?_

_No, no_ φ _quiero._

‘Do you want tea?’
No, I don’t.’

The position of overt clitics in relation with the verbs that host them depends on whether such verb is finite or infinite, and imperatives in Spanish present syntactic features characteristic from both groups (Ezeizabarrena, 1997). Specifically, Spanish imperatives resemble infinitive verbs in that their clitics appear in post-verbal or enclitic position (20a, 20b, 20c). On the other hand, in negative imperative clauses, surrogate or suppletive verb forms (i.e., present subjunctive) do not feature post-verbal clitics. Instead, clitics take a pre-verbal or proclitic position as in other clauses with finite verbs (21a, 21b):

(20)

a. Infinitive verb form with enclisis: mirarlo, ‘to look at it’
b. Gerund verb form with enclisis: mirándolo, ‘looking at it’
c. Imperative verb form with enclisis: ¡Míralo!, ‘Look at it!’

(21)

a. Present subjunctive as surrogate or suppletive form in an imperative clause: ¡No lo llames!, ‘Do not call him!’
b. Present subjunctive in a non-imperative clause: Quiero que lo llames. ‘I want you to call him.’

Following the syntactic accounts provided by Rivero and Terzi (1995) and Alcázar and Saltarelli (2013), this contrast in clitic placement is the result of the different positions of true or dedicated imperative verb forms (e.g., ¡Mira! ‘Look!’; ¡Míralo! ‘Look at it!’), hosted in the CP layer, as opposed to surrogate verb forms (e.g., ¡No mires! ‘Do not look!’; ¡No lo mires! ‘Do not look at it!’), which are positioned in a lower position. True imperative verb forms precede clitics as a result of their high position in the CP layer while clitics precede surrogate verb forms, which are hosted in a lower
position and share their syntactic features with the other finite verbs in Spanish (Ezeizabarrena, 1997).

In summary, this section has introduced the distribution and position of clitics in imperative clauses as well as the syntactic and semantic features behind those. Clitics appear overtly except when the antecedent to which they refer is indefinite non-specific. In that case, clitics are dropped and appear in their null form. Additionally, regarding their relation with imperatives, clitics appear in post-verbal or enclitic position when hosted by an imperative verb form, whereas they appear in pre-verbal or proclitic position if the verb host is the surrogate or suppletive verb form (i.e., present subjunctive) in an imperative clause.

2.3. Formality as social distance in Spanish

Formality has been defined as ‘the social distance of speaker and hearer’ (Brown & Levinson, 1987, p. 74). Bembridge and Peters (2018) interpret the notion of ‘formality as distance’ literally and propose that pronominal systems may incorporate an operator based on Harbour’s (2016) χ (from Greek xoros ‘space’). Bembridge and Peters (2018) build on this operator, which encodes spatial semantics, and propose a δ projection in which individuals can be [proximal] and/or [distal] from the characteristic space (Harbour, 2016) relative to the author, as described by χ. Bembridge and Peters (2018) propose the following analysis to account for formality in pronouns in syntactic terms:
Figure 10: Bembridge and Peters’s (2018) analysis on formality as distance

In this analysis, the authors employ Harbour’s (2014) analysis of number and Harbour’s (2016) featural inventory of [author] and [participant] under a projection π. Specifically, for languages that only distinguish between singular and plural in their pronominal systems only [±atomic] is necessary. On the other hand, their analysis of formality is conceived for the second person, [+ participant, − author] under the projection π (Cowper & Hall, 2017; Harbour, 2016). Finally, δ is an operator that must appear along with χauthor, but is not employed in every pronoun. The operator δ sets a relation between χauthor and the individual defined by number and π. Such relation can be defined with the features [proximal] and/or [distal].

Bembridge and Peters (2018) indicate that, in Spanish, second person π mandatorily combines with the δ – χ complex. In Spanish, the relation of this complex is described by the feature [proximal]:

a. tú: [Num[±atomic] [π [δ [+prox]]]]
b. vosotros: [\text{Num}[\text{atomic}][\pi[\delta[+\text{prox}]]]]

c. usted: [\text{Num}\emptyset[\pi[\delta[-\text{prox}]]]]

d. ustedes: [\text{Num}[-\text{atomic}][\pi[\delta[-\text{prox}]]]]

Vocabulary items:

a. \( \chi \rightarrow \delta[+\text{prox}] \rightarrow \pi \Leftrightarrow \text{vosotros} /\_\_\_ \text{Num}[-\text{atomic}] \)

b. \( \chi \rightarrow \delta[+\text{prox}] \rightarrow \pi \Leftrightarrow \text{tú} \)

c. \( \chi \rightarrow \delta[-\text{prox}] \rightarrow \pi \Leftrightarrow \text{usted} \)

d. \( \text{Num}[-\text{atomic}] \Leftrightarrow -(e)s \)

In the pronouns above, ‘usted’ is underspecified for number; the vocabulary item ‘-(e)s’ gives [-atomic] features to the pronoun, while ‘tú’ and ‘vosotros’ have their own number regardless of vocabulary items. The pronoun ‘vosotros’ is only used in Peninsular Spanish; therefore, formality in second person plural is only instantiated in the pronominal system of Peninsular Spanish. In other varieties, ‘ustedes’ is the only second person plural pronoun and there is no formality contrast (Azevedo, 2009). Cambridge and Peters’s (2018) analysis also covers other varieties of Spanish, namely Salvadorean Spanish, a ‘voseo’ variety in which ‘vos’ replaces ‘tú’ (Lipski, 2007), and Cuban Spanish, a variety in which ‘tú’ is replacing ‘usted’ (Lipski, 2007). Salvadorean Spanish displays a three-way formality contrast: ‘tú’ is [-proximal], ‘vos’ is [+proximal], and ‘usted’ lacks proximal and distal features. The authors argue that, if the \( \delta – \chi \) complex is not present, the elsewhere case, ‘usted’, is inserted by default and interpreted as ‘formal’. Cuban Spanish, on the other hand, does not include the \( \delta – \chi \) complex; therefore, this variety is losing the distinction between ‘tú’ and ‘usted’. These two varieties use ‘ustedes’ as their only [-atomic] form regardless of social distance.
In English, as opposed to Spanish, there exists no $\delta - \chi$ complex or relation between them. Furthermore, another difference between Spanish and English is in number: number in the Spanish pronominal system can be described with $[\pm \text{atomic}]$ across all persons, whereas in English, such distinction does not occur in the second person. From an acquisition perspective, an English-speaking learner of Spanish needs to acquire the operator $\delta$ and how it relates to $\chi_{\text{author}}$, as well as the feature $[\pm \text{atomic}]$ under the projection number. On the other hand, the only aspect that Spanish and English share under Bembridge and Peters’s (2018) analysis is under the projection for person $\pi$.

2.4. Summary

In this chapter, I have discussed two syntactic accounts for imperatives in Spanish. Both Rivero and Terzi’s (1995) and Alcázar and Saltarelli’s (2014) analyses claim that Spanish imperative verb forms are raised to the CP layer; however, only the former analysis provides a detailed account for subject-verb agreement in imperative clauses. Additionally, this chapter introduces the distribution and position of clitics in imperative clauses; specifically, how overt clitics appear in enclitic or proclitic position depending on the main verb of the imperative clause. Furthermore, this chapter presents Bembridge and Peters’s (2018) syntactic account on formality as social distance in Spanish and other Romance languages. Building on the differences between Spanish and English with respect to imperatives and the instantiation of social distance in pronominal systems and verb paradigms, the next chapter presents the process through which English-speaking heritage speakers of Spanish and English-speaking second language learners of Spanish go in order to acquire the morphosyntactic features of the Spanish imperatives.
Chapter 3

The acquisition of Spanish imperatives

3.1. Introduction

In this chapter, I discuss current theories of heritage and second language acquisition. This chapter also discusses the role of lexical frequency in the acquisition of morphosyntactic properties. Lexical frequency, which can be defined as how often a given lexical item appears in the input (Ellis & Collins, 2009), has been found to have a role in the acquisition of both second (Ellis & Collins, 2009) and heritage languages (Giancaspro, 2017; Hur, forthcoming). Specifically, second language and heritage speakers present less variability in their syntactic and morphological knowledge of frequent lexical items as opposed to lexical items that are rarely present in the input that they receive. Furthermore, in this chapter, I describe the acquisition process through which Spanish imperatives are acquired by English speakers. Specifically, this chapter examines the differences between English and Spanish imperatives and those properties that English speakers need to acquire. Finally, I review previous studies on the acquisition of Spanish imperatives, most of which focus on child acquisition.

3.2. Heritage language acquisition theories

This section covers some current theories of heritage language acquisition. First, I introduce some definitions of what a heritage speaker is. Then, I present and discuss some theories of heritage language acquisition.

In this study, heritage speakers are defined as “bilingual speakers in the USA who learned a language other than English at home but have been immersed in English since
childhood and often exclusively schooled in it” (Austin, Blume & Sánchez, 2015, p. 80; Wiley & Valdés, 2000). Rothman (2007) defines heritage speakers as bilinguals who are exposed naturalistically to the heritage language, which is a non-hegemonic minority language within a majority-language environment. Heritage speakers present some proficiency in the heritage language, although they do not need to be fluent in their heritage language (Rothman, 2007; Valdés, 2001).

Different heritage language theories account for the divergences between the outcome of heritage language acquisition and the outcome of monolingual language acquisition. The theories presented in this section are based on different approaches to heritage language acquisition: differences in the mental representation of the heritage language in heritage speakers in comparison with monolingual counterparts (Montrul, 2002; Polinsky, 2006), the quality of the input received by heritage speakers (Pires & Rothman, 2009), and divergence in the heritage speakers’ production and comprehension of the heritage language due to reduced activation of the heritage language (Putnam & Sánchez, 2013).

Montrul (2002) claims that the divergences presented between the outcomes of heritage language acquisition and monolingual language acquisition are due to an “incomplete acquisition” of the heritage language. Heritage speakers are argued to not have a complete mental representation of the heritage language and, therefore, present a different featural knowledge than monolinguals. This incomplete acquisition approach has accounted for divergences in heritage language acquisition in the knowledge of the feature [perfective] in the past tense of Spanish (Montrul, 2002), of DOM in Spanish
(Montrul & Sánchez-Walker, 2013), as well as of case marking, gender, and verb inflectional morphology in Russian (Polinsky, 2006). However, this approach presents some limitations. As Giancaspro (2017) points out, if heritage speakers present an incomplete acquisition of the language in a sense that heritage speakers lack featural knowledge of the heritage language, they should not show within-subject or within-group variability. Instead, heritage speakers would show either categorical knowledge or lack of knowledge of some structures of the heritage language. In other words, differences in the mental representation of the heritage language due to lack of featural knowledge may account for binary outcomes, but not for individual or within-group variability among heritage speakers.

Pires and Rothman (2009) argue that the divergence in heritage language acquisition derives from the quality of the input to which heritage speakers are exposed. Specifically, the authors argue that heritage speakers acquire the language from the input to which they are exposed, which has already undergone a process of attrition. For instance, Rothman (2007) found that heritage speakers of Brazilian Portuguese showed divergence from monolingual speakers in their knowledge of inflected infinitives in Portuguese. The author argues that these differences exist because monolingual Brazilian Portuguese speakers acquire the use and distribution of inflected infinitives of Brazilian Portuguese through schooling, while heritage speakers are barely exposed to those forms in the input that they receive.

This approach presents both strengths and limitations. On the one hand, it reminds us to take into consideration that the heritage language that heritage speakers acquire is
based on the input that they are exposed to, which can present signs of language attrition. On the other hand, this approach does not account for within-subject variability. If heritage speakers are exposed to a specific structure consistently, this approach cannot explain why a heritage speaker does not show a consistent production or comprehension of such structure.

Putnam and Sánchez (2013) propose the activation approach to account for divergences and variability in heritage language. The authors consider that language acquisition is not an outcome, but a dynamic process that can present shifts through time. This view could account for dominance shifts across the lifespan of heritage speakers and bilinguals in general. These shifts are derived from how frequently heritage speakers activate their languages, either for production or comprehension purposes. Under Putnam and Sánchez’s (2013) activation approach, the different patterns of language activation for production and comprehension account for within-subject asymmetries in their production vs. comprehension knowledge.

The authors propose a model of heritage language acquisition and maintenance with four different stages:

Stage 1: heritage speakers transfer or re-assembly some of the functional features (FF) from their L2 (dominant language) to the phonological forms (PF) and semantic features of their L1 (heritage language).

Stage 2: heritage speakers transfer or re-assemble large sets of FFs from the L2 to the L1 PF and semantic features. They activate their L2 for production more than their L1.
Stage 3: heritage speakers show difficulties activating PF and semantic features in the L1 for production purposes, but they can activate their heritage language for comprehending high frequency lexical items.

Stage 4: heritage speakers have difficulties activating PF and semantic features of their L1 for both production and comprehension purposes.

This model follows a lexicalist approach to language acquisition, in which heritage speakers need to assemble the functional features, semantic features and phonological form of the lexical items of their heritage language for both production and comprehension purposes. The activation approach and its model for heritage language acquisition and maintenance are consistent with previous proposals on second language acquisition based on featural knowledge and re-assembly (Jiang, 2000; Lardiere, 2008, 2009), discussed in the section below.

The activation approach provides a systematic account for heritage acquisition divergence from monolingual acquisition, as well as for within-group and within-subject variability by considering language activation for production and comprehension purposes as a factor for heritage language maintenance. Additionally, this approach can explain within-subject asymmetries between production and comprehension in the heritage language.

To conclude, this section has presented three approaches to heritage language acquisition and maintenance. Nonetheless, only the activation approach (Putnam & Sánchez, 2013) succeeds in accounting for divergences between heritage and monolingual language acquisition, as well as for within-group and within-subject
variability. Therefore, in this dissertation study, I test Putnam and Sánchez’s (2013) activation approach to confirm whether it can account for the results of the present study.

3.3. Second language acquisition theories

In this section, I discuss three second language acquisition accounts. Specifically, this section presents Lardiere’s (2008, 2009) Feature Re-assembly Hypothesis (FRH) and Jiang’s (2000) proposal on lexical representation and development in second language speakers. Putnam and Sánchez’s (2013) activation approach is consistent with these second language acquisition proposals. Finally, I discuss Slabakova’s (2019) updated Bottleneck Hypothesis.

Lardiere’s (2008, 2009) FRH is based on the assumption that L1 acquisition consists in selecting a particular subset of features from the inventory of possible features in languages. Each language selects a specific subset of features, organizes and assembles them to morphology. L2 learners would, therefore, need to select their L2 features, which may or not be in their L1, and re-assemble them into L2 morphology. Lardiere (2008) presents the case of Patty, a Chinese-speaking L2 learner of English, whose production of certain English syntactic phenomena (e.g., wh-movement, raising and case marking) may mislead researchers to believe she has not acquired the features involved in such phenomena. However, Patty’s results from an acceptability judgment task showed that she has a consistent receptive grammatical knowledge of the structures on which she showed variable target-like production.

The author argues that second language learners may acquire the features involved in syntactic structures and show grammatical knowledge about them but
divergences from monolinguals in their production. These production divergences from monolinguals may stem from a lack of morphological competence. Lardiere argues for the need to include some notion of morphological competence in any attempt to account for variability in second language acquisition. Specifically, second language learners may acquire the syntactic features in a syntactic structure but are still in the process of re-assembling those features to PF due to their lack of morphological competence.

This second language hypothesis accounts for the divergence between second language learners and monolinguals, as well as for within-subject variability. The present study examines the acquisition of imperatives in Spanish among English-speaking second language learners of Spanish. This hypothesis could account for the results found in this study, especially the results on the acquisition of subject-verb agreement morphology. Second language learners may show asymmetries in their production and receptive grammatical knowledge as a result of their lack of morphological competence.

Jiang’s (2000) proposal on lexical representation and development in second language speakers is a lexicalist approach to second language acquisition. Jiang claims that the lexical knowledge of second language learners goes through three different stages in which they gradually acquire more parts of the lexicon. In the first stage, they acquire the formal (phonological and orthographic) specifications of a lexical item. In the second stage, they acquire its semantic and syntactic specifications. Finally, in the third stage, they acquire the last specification of the lexical item: its morphology. During this process, L2 learners rely on the specifications of the lexical items of their L1 to compensate for the lack of knowledge of some specifications in their L2 lexicon. Within
this view, the second language lexicon is said to be fossilized if the second language learner does not go beyond the second stage and still relies on semantic and syntactic knowledge of their L1 to compensate for the gaps in their L2.

Jiang’s (2000) proposal is consistent with Lardiere’s (2008, 2009) in that both of them emphasize the importance of morphological knowledge in second language acquisition. Additionally, both views consider that the knowledge of syntactic features is acquired earlier than the morphology in which those syntactic features may be instantiated. However, Lardiere’s (2008, 2009) FRH does not explain how morphological competence is achieved, while Jiang’s (2000) lexical approach does provide an acquisitional path for lexical items and their specifications.

Finally, Slabakova’s (2019) Bottleneck Hypothesis claims that some language components are more challenging to acquire than others for second language learners. Specifically, she argues that functional morphology is particularly difficult for second language learners. When measuring knowledge of a phenomenon, the author argues that it goes beyond recognition and production of such phenomenon; instead, the knowledge of a phenomenon has to include all its morphophonological, syntactic, and semantic facets. The author provides an example of the English past tense. For this functional feature, second language learners would be expected to know morphophonological (e.g., all the allomorphs of the past tense marker as well as the irregular past tense verb forms), syntactic (e.g., subject-verb agreement), and semantic (e.g., temporal meaning of the past tense marker as well as its interactions with aspectual readings).
Slabakova (2019) argues that adult L2 acquisition follows a similar qualitatively developmental path to L1 acquisition, although some outcomes may be different due to the role of the L1, namely L1 transfer, and reduced input in the L2, which render L2 acquisition more complicated. In syntax, the difficulties in L2 acquisition have been shown in L1 transfer of VP word order (Meisel, Clahsen, & Pienemann, 1981; Schwartz & Sprouse, 1994, 1996). Specifically, the author claims that the bottleneck of L2 acquisition is functional morphology by providing examples of second language learners who have acquired syntax but not functional morphology (Lardiere, 1998; Li, 2012; Vainikka & Young Scholten, 1996) and of second language learners who acquire syntax faster than functional morphology (Jensen, Slabakova, & Westergaard, 2017). Slabakova (2019) concludes that functional morphology is behind most of the languages acquisition challenges.

In the present study, I test both Lardiere’s (2008, 2009) FRH and Jiang’s (2000) proposal on lexical representation and development in second language speakers in order to confirm whether they can account for the results found among second language learners of Spanish. Indeed, I test a combination of these two theoretical accounts for second language acquisition. Specifically, I integrate these two proposals by claiming that the acquisition of morphological specifications in the last stage of the developmental path established by Jiang (2000) is consistent with Lardiere’s (2008, 2009) claims on the importance of the notion of lack of morphological competence in feature re-assembly processes among second language learners. Additionally, I am also testing Slabakova’s
(2019) Bottleneck Hypothesis to confirm whether functional morphology is the main difficulty that L2 learners encounter.

In conclusion, Lardiere’s (2008, 2009) FRH and Jiang’s (2000) proposal on lexical representation and development are consistent with each other and may have explanatory power to account for the divergences that may be found between second language learners and Spanish-dominant speakers, as well as within-group and within-subject variability. Similarly, Slabakova’s (2019) Bottleneck Hypothesis could account for a mismatch between syntax and functional morphology knowledge in second language learners.

3.4. The effects of lexical frequency on the acquisition of morphosyntax

As mentioned in the section above, I adopt Putnam and Sánchez’s (2013) activation approach and Jiang’s (2000) lexicalist approach to second language acquisition. These approaches account for heritage and second language acquisition, respectively, following a lexically-driven approach. The present study explores the role of lexical frequency in within-subject variability in both heritage speakers and second language learners.

In this section, I will discuss the effects of lexical frequency on the acquisition of morphosyntactic properties among non-dominant bilingual speakers. Frequency effects on second language acquisition have been examined from different perspectives: by using a corpus-based methodology (Collins, Trofimovich, White, Cardoso, & Horst, 2009; Ellis & Ferreira-Junior, 2009; Wulff, Ellis, Römer, Bardovi-Harlig, & LeBlanc, 2009), by analyzing the link between input and production in the classroom (McDonough & Kim,
2009; Year & Gordon, 2009), and in processing (Ellis, 2002). On the other hand, lexical frequency effects in heritage language acquisition are understudied, with a few exceptions (Giancaspro, 2017; Hur, forthcoming).

Ellis and Collins (2009) define both token and type frequency. Token frequency is defined as the count of “how often a particular form appears in the input” (p. 330). On the other hand, type frequency “refers to the number of distinct lexical items that can be replaced in a given slot in a construction” (p. 330). Second language acquisition research has found positive correlations between type frequency of a given syntactic structure and its acquisition among second language learners. These results have been found for verb morphemes (Collins et al., 2009), verb and argument constructions (Ellis & Ferreira-Junior, 2009), wh-questions, (McDonough & Kim, 2009), tense and aspect verb morphology (Wulff et al., 2009), and ditransitive constructions (Year & Gordon, 2009).

While type frequency is argued to facilitate the acquisition of a given structure (McDonough & Kim, 2009), the effect of token frequency on the knowledge of a structure remains understudied, with a few exceptions.

Studies on heritage language have found that heritage language knowledge is variable and influenced by lexical frequency. Dorian (1981) documents that heritage speakers of Gaelic have gender knowledge only in a subset of nouns. Also, Gal (1989) claims that heritage speakers of Hungarian are more likely to produce morphological causatives with frequent verbs. Giancaspro (2017) is the first experimental study to look at lexical frequency effects on morphosyntactic knowledge. The author examined the relation between lexical frequency and mood knowledge in Spanish as a heritage
language by using production and comprehension tasks. Their results show that mood knowledge among heritage speakers of Spanish is strongly modulated by verb lexical frequency, at both group and individual level. Heritage speakers show more sensitivity to the distinction between subjunctive and indicative moods in contexts involving high frequency verbs, whereas more variability was found in contexts involving low frequency verbs. Hur (forthcoming) also found verb lexical frequency effects on syntactic knowledge among heritage speakers of Spanish. The author examined the relation between verb frequency and knowledge of the Spanish Differential Object Marking (DOM) by using production and comprehension tasks. Results show that verb lexical frequency modulates heritage language knowledge of the Spanish DOM; specifically, verb lexical frequency had effects on the production of Spanish DOM among intermediate heritage speakers. Both Giancaspro (2017) and Hur (forthcoming) argue that lexical frequency can be conceived as a proxy for frequency of activation within the frame of the activation approach (Putnam & Sánchez, 2013): more frequent lexical items are more frequently activated in the bilingual mind, which allows for the re-assembly of features necessary to produce and comprehend language.

In summary, type and token frequencies play a role in the acquisition of morphosyntax in non-dominant languages. Type frequency facilitates the acquisition of morphosyntactic structures (Ellis, 2002; Ellis & Collins, 2009; McDonough & Kim, 2009), and token frequency, particularly lexical frequency, has an effect on the acquisition of such structures: the more frequent a given lexical item is, the more likely it is to activate morphosyntactic knowledge in the bilingual mind (Giancaspro, 2017; Hur,
forthcoming). This view is consistent with Putnam and Sánchez’s (2013) activation approach to heritage language acquisition and maintenance.

**3.5. The acquisition of the Spanish imperatives by English speakers**

Imperatives are one of the three main clause types across languages along with declaratives and interrogatives. Their semantic and pragmatic uniqueness make imperative clauses frequent and indispensable. Previous research investigating the acquisition of the Spanish imperative has mostly focused on child acquisition, both monolinguals (Gathercole, Sebastián & Soto, 1999, 2002) and bilingually raised (Ezeizabarrena, 1997; Grinstead, 1998). Nevertheless, the acquisition of Spanish imperatives among English-speaking heritage speakers and second language learners is still understudied. The present study investigates the acquisition of Spanish imperatives, specifically of some of its morphosyntactic features: subject-verb agreement in number and social distance, and the use of surrogate or suppletive forms.

Spanish and English show differences in their imperative verb paradigm. Spanish, on the one hand, displays a pragmatically restricted paradigm with poor morphology (Ezeizabarrena, 1997; Grinstead, 1998). On the other hand, English imperatives make use of their bare forms (Liceras, 2006). Table 1 presents the verb paradigm for Spanish affirmative imperatives and their surrogate form (Azevedo, 2009, p. 123):
Table 1. Verb paradigm for imperatives and surrogate form in Spanish

<table>
<thead>
<tr>
<th></th>
<th>Canonical imperative form or affirmative imperative</th>
<th></th>
<th></th>
<th></th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>2nd p sg ‘tú’</td>
<td>2nd p sg ‘usted’</td>
<td>2nd p pl ‘vosotros’</td>
<td>2nd p pl ‘ustedes’</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Habla</td>
<td>Hable</td>
<td>Hablad</td>
<td>Hablen</td>
<td>Talk</td>
<td></td>
</tr>
<tr>
<td>Come</td>
<td>Coma</td>
<td>Comed</td>
<td>Coman</td>
<td>Eat</td>
<td></td>
</tr>
<tr>
<td>Parte</td>
<td>Parta</td>
<td>Partid</td>
<td>Partan</td>
<td>Break</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Surrogate or suppletive form (present subjunctive)</th>
<th></th>
<th></th>
<th></th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>2nd p sg ‘tú’</td>
<td>2nd p sg ‘usted’</td>
<td>2nd p pl ‘vosotros’</td>
<td>2nd p pl ‘ustedes’</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No hables</td>
<td>No hable</td>
<td>No habléis</td>
<td>No hablen</td>
<td>Do not talk</td>
<td></td>
</tr>
<tr>
<td>No comas</td>
<td>No coma</td>
<td>No comáis</td>
<td>No coman</td>
<td>Do not eat</td>
<td></td>
</tr>
<tr>
<td>No partas</td>
<td>No parta</td>
<td>No partáis</td>
<td>No partan</td>
<td>Do not break</td>
<td></td>
</tr>
</tbody>
</table>

Aguirre and Dressler (2006) propose a model for Spanish verb inflection in which inflectional verb morphology is categorized according to theme vowels. Specifically, theme vowels organize inflectional verb morphology in two macroclasses: the first macroclass (class -ar verbs, such as saltar ‘to jump’, viajar ‘to travel’) represent 90% of the verbs while the second macroclass (class -er and -ir verbs) are not as frequent. The second macroclass is divided in Classes II (e.g., coser ‘to sew’, correr ‘to run’) and III (e.g., elegir ‘to choose’, fundir ‘to melt’). Theme vowels may not appear in the inflection in some verb forms (e.g., 1st person singular of the simple present of regular verb forms) or change, as in subjunctive verb forms. In addition to verbs, theme vowels have been argued to be part of nouns and adjectives too, as part of their inflectional class features (Harris, 1983, 1985, 1999, *inter alia*). However, more recent proposals claim that theme vowels are not part of the inflection but a way to categorize the lexicon in different
categories of stems and derivational suffixes (Bermúdez-Otero, 2013; Oltra-Massuet & Arregi, 2005).

Additionally, Azevedo (2009, p. 267) also presents examples of the imperative verb paradigm in ‘voseo’ varieties, characterized by the featuring of the informal pronoun ‘vos’ instead of or combined with ‘tú’. The author organizes the verb paradigms in two categories: varieties from Argentina, Uruguay, Paraguay, and Central America, as opposed to the variety from Chile.

Table 2. Verb paradigm for imperatives and surrogate form in ‘voseo’ varieties

<table>
<thead>
<tr>
<th>Canonical imperative form or affirmative imperative</th>
<th>Argentina, Uruguay, Paraguay and Central America</th>
<th>Chile</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tomá</td>
<td>Tomá</td>
<td>Take</td>
<td></td>
</tr>
<tr>
<td>Comé</td>
<td>Comí</td>
<td>Eat</td>
<td></td>
</tr>
<tr>
<td>Partí</td>
<td>Partí</td>
<td>Break</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Surrogate or suppletive form (present subjunctive)</th>
<th>Argentina, Uruguay, Paraguay and Central America</th>
<th>Chile</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>No tomés</td>
<td>No tomís/tomí</td>
<td>Do not take</td>
<td></td>
</tr>
<tr>
<td>No comás</td>
<td>No comáis/comái</td>
<td>Do not eat</td>
<td></td>
</tr>
<tr>
<td>No partás</td>
<td>No partáis/partáí</td>
<td>Do not break</td>
<td></td>
</tr>
</tbody>
</table>

Heritage speakers of Spanish, as well as second language learners, may have been exposed to ‘voseo’ varieties and, therefore, have acquired the verb paradigm above. The current study avoids elicitation with the use of pronouns in order to avoid task effects due to dialectal differences. Instead, this study elicits the use of imperative clauses with the
use of different non-pronominal vocatives (e.g., proper nouns, titles or forms of address, etc.).

Following Alcázar and Saltarelli (2014), the addressee in imperative verbs receives case, person, and number features. The Spanish imperative paradigm agrees with the subject of the clause, licensing nominative case, person (2\textsuperscript{nd} person), and number (either singular or plural). Additionally, Spanish verb paradigms are also sensitive to pragmatic factors, namely the formality or social distance between the speaker and the addressee of the utterance. Such social distance relation is incorporated in the pronominal system (Bembridge & Peters, 2018). Specifically, as explained in the chapter above, Bembridge and Peters (2018) claim that, in Spanish, the relation between the speaker or the author of the utterance and the addressee can be either [+proximal], and be instantiated in the pronoun ‘tú’ or ‘vos’ and its respective verb paradigm, or [-proximal], and be instantiated in the pronoun ‘usted’ and its respective verb paradigm. These formality contrasts in the pronominal system in Spanish are presented in detail in Section 2.3, although some dialectal variation in such contrasts and in verb paradigms are not fully covered.

The last morphosyntactic property of the Spanish imperative that this study is looking at is the use of surrogate or suppletive forms. Spanish imperative verbs belong to Class I; when combined with a Neg Phrase, Spanish imperative clauses make use of the subjunctive verb paradigm along with its morphosyntactic features instead of the imperative verb paradigm. English imperative verbs, on the other hand, are not part of the
Class I; their form or features do not change depending on the presence of a negative phrase in the clause.

The acquisition process that English-speaking heritage speakers of Spanish and English-speaking second language learners of Spanish face regarding this phenomenon is a two-folded task. They need to delimit the uses of the two verb paradigms employed in Spanish imperative clauses, as well as the morphology and morphosyntactic properties of each of the two verb paradigms. Previous research on the acquisition of the Spanish subjunctive (Giancaspro, 2017; Perez Cortes, 2016) shows that heritage speakers of Spanish present difficulties with the acquisition of subjunctive morphology and that this difficulty is related to lexical frequency. The current study includes lexical frequency as a variable in order to determine whether this factor plays a role in the acquisition of the Spanish imperative, both its dedicated or true form and its surrogate or suppletive form (i.e., present subjunctive). Pragmatic distance is encoded in 2nd person verb morphology in Spanish imperatives, as in other verb paradigms; however, this study does not examine the acquisition of pragmatic distance in the imperatives of second language learners or heritage speakers. Nonetheless, it will discuss the variation found in the subjects’ production of the different inflectional verb morphology in which pragmatic distance is encoded.

To sum up, the present study looks at the acquisition of the Spanish imperative by English-speaking populations. English-speaking heritage speakers of Spanish and English-speaking second language learners of Spanish need to acquire the verb morphology of two paradigms: the imperative (the dedicated or true imperative form) and
the subjunctive (the surrogate or suppletive form), as well as that their use is determined by the presence of a Neg Phrase. The verb morphology of these two paradigms is the instantiation of subject-verb agreement, specifically to person (pragmatically limited to 2nd person in the imperative verb paradigm), number, and social distance. The research questions of the present study are guided by this acquisition process.

3.6. Previous studies on the acquisition of Spanish imperatives

In this section, I will discuss previous studies looking at the acquisition of the Spanish imperatives. Most of the previous research has focused on the acquisition of Spanish imperatives among children: monolingual Spanish speakers (Gathercole, Sebastián, & Soto, 1999, 2002), bilingually raised in Spanish and Catalan (Grinstead, 1998) and in Spanish and Basque (Ezeizabarrena, 1997). To my knowledge, there is not any study looking at the acquisition of the Spanish imperative among adult heritage speakers or second language learners.

Ezeizabarrena (1997) analyzed data from a corpus of biweekly video recordings of two bilingual children who acquire both Spanish and Basque since birth. The children were recorded in meals and playtimes. The recording sessions started when they were 1;08 and 1;10 and ended when they reached the age of 4. The author claims the acquisition of imperatives among children is interesting because it occurs at an early age, it is a frequently used form among young children, and it presents poor verbal morphology. Indeed, the two children from the corpus produced 2nd person imperatives in their first session. However, Ezeizabarrena notes that the imperative forms used by the children may not be evidence of knowledge of the imperative verb morphology, given
how weak 2nd person imperative verb morphology is in Spanish. In fact, the author states that imperatives present two main morphosyntactic properties. First, imperatives tend to present defective morphology. In other words, the imperative paradigm is incomplete because it does not include all grammatical persons and is not marked for time or aspect. Second, imperatives show properties that distinguish them from finite verbs. For instance, they allow for null subjects in non-pro-drop languages and can precede objects in OV languages.

The study also looks at the acquisition of surrogate or suppletive forms in negative imperatives, in which it is to determine whether the children treat imperatives as finite or non-finite forms due to their richer verb morphology. One of the children, M, does not produce any form of surrogate or suppletive forms with 2nd person singular morphology in negative imperatives until the age of 2;06. Before, M produced mostly verb forms with only theme vowels (as 3rd person singular present forms). From the age of 2;06, M alternated the use of the adult-like present subjunctive surrogate (e.g., no tires, no rompas) form with present indicative forms containing 2nd person singular verb morphology (e.g., no tiras, no pisas). From the age of 3;0, all of M’s negative imperatives were adult-like. For other verb paradigms, M started producing adult-like verb forms with subject-verb agreement at the age of 1;10. Nonetheless, all clitics produced in imperative clauses featured an adult-like pattern (i.e., proclisis with imperative verb forms).

On the other hand, the two children produced infinite imperatives in Basque throughout all the data collection period. The author argues that these infinite imperative
forms are the most frequent ones among adults. The children’s imperatives were mostly infinite before their inflectional morphology in Basque was productive, at the ages of 2;00 for M and 2;08 for J. After those ages, the proportion of finite imperative forms started increasing.

Ezeizabarrena (1997) concludes that children produce adult-like imperative forms in Spanish at a young age, but it is difficult to determine whether they are producing second person inflectional morphology or a bare form due to the poor morphology of imperative forms in Spanish, but mostly to the fact that imperatives in Spanish are in the middle of the continuum between finite and non-finite forms. The fact that children may not be aware of the finiteness of imperatives in Spanish can also account for why adult-like forms of negative imperative do not appear consistently until the age of 3;00.

Grinstead (1998) examines the acquisition of subject and imperatives among Spanish-speaking and Catalan-speaking children. The author notes that imperatives are realized, but never combined with negation: the children under examination never produce ungrammatical imperative clauses using a negative phrase combined with an imperative verb form instead of with a surrogate or suppletive form. Grinstead claims that this is the result of principles of Universal Grammar. Specifically, “child Spanish and Catalan speakers cannot raise imperatives over negation because doing so would violate Relativized Minimality” (p. 137). Furthermore, Grinstead argues that children that age do produce negation in declaratives, but they do not produce surrogate or suppletive forms in their negative imperative clauses because “subjunctive morphology is generally not available to children in this early period” (p. 142).
Gathercole, Sebastián, and Soto (2002) reply to Grinstead’s work by claiming that, among Spanish-speaking children, negative imperatives may be rare in young child language, but they occur. Children produce imperative clauses with illocutionary force using present indicative or a rote-learned possible phonetically reduced form of the verb (e.g., no toca ahí, no caga, no cupeh). Gathercole, Sebastián and Soto (2002) also note that the acquisition of the subjunctive mood took place after the acquisition of negative imperatives among the Spanish-speaking children that they examined. Their acquisition of imperative verbs and surrogate or suppletive forms is lexically driven, as early knowledge of verbs and verb forms is lexically specific.

Gathercole, Sebastián, and Soto (1999) analyze the speech of a group of Spanish-speaking children and note that the acquisition of verb paradigms is lexically driven and is not error-free. For instance, a verb like mirar may be used in an imperative clause (e.g., ¡Mira!) earlier than in other verb paradigms, while acabar may do so in the preterit (e.g., Acabó). Additionally, there is no evidence that affirmative imperatives occur earlier than other verb forms. Gathercole et al. (1999) define this process as a piecemeal acquisition.

To summarize, the acquisition of imperatives in Spanish is characterized by its early appearance in child acquisition. On the other hand, the acquisition of negative imperatives does not take place until later, given that negative imperatives are not mastered until 3:00 (Ezeizabarrena, 1997). Grinstead (1998) discusses that, until that age, Spanish-speaking children do not produce any negative imperatives with either imperative verb forms or surrogate forms. On the other hand, Gathercole et al. (1999) claim that the acquisition of imperatives in Spanish is not error-free: Spanish-speaking
children do produce non-adult-like negative imperatives, with imperative verb forms instead of surrogate verb forms before mastering their distribution. These authors emphasize how lexically-driven the acquisition of imperatives is and argue that it could be considered as a piecemeal acquisition process as opposed to Grinstead’s (1998) rather categorical view.

3.7. Motivation for the present study

This dissertation examines the acquisition of Spanish imperatives among heritage and second language speakers with the goal to provide insights on the order of acquisition of syntactic features. Previous proposals have suggested that purely syntactic features are acquired earlier than morphology. Nevertheless, given the nature of Spanish imperatives, which present a rich syntax but a rather defective morphology (Ezeizabarrena, 1997), the present dissertation study aims to examine whether syntax precedes morphology also in the acquisition of Spanish imperatives.

For instance, in second language acquisition, both Jiang’s (2000) proposal on lexical representation and development in second language speakers and Lardiere’s (2008, 2009) Feature Re-assembly Hypothesis focus on the difficulty to acquire morphology among second language learners, while syntax does not seem to represent such a considerable challenge. Similarly, Putnam and Sánchez’s (2013) activation approach to account for variability in heritage speakers’ outcomes also emphasizes the challenge that morphology poses for these bilinguals. Particularly, the authors claim that even those heritage speakers in the first stage of heritage language acquisition and maintenance feature differences with dominant speakers in that they transfer or re-
assemble some functional features from their dominant language to the phonological forms and semantic features of their heritage language.

In order to investigate which syntactic features are acquired earlier and which pose difficulty to heritage and second language speakers, this dissertation study examines the acquisition of three aspects:

First, the study looks at number in subject-verb agreement in imperative verb forms, in both singular and plural. According to the previous proposals discussed above, this morphosyntactic feature should be the most challenging to acquire given its morphological complexity.

Second, the study also investigates the acquisition of the use of surrogate or suppletive verb forms in negative imperative clauses. As discussed in Chapter 2, imperative verb forms cannot be combined with negative phrases given their syntactic features. Specifically, negative phrases prevent imperative verb forms from raising to the syntactic operator hosted in the CP layer (Alcázar & Saltarelli, 2014; Rivero & Terzi, 1995); therefore, a surrogate or suppletive form is employed. According to the proposals discussed previously, the challenge that this poses lies in the need to acquire the morphology of the surrogate or suppletive verb form and not so much on its syntactic side.

Third, the study also examines the acquisition of clitic position in affirmative and negative imperative clauses. Given that imperative verb forms raise to the syntactic operator in the CP layer but negative phrases block such verb movement resulting in the use of surrogate or suppletive verb forms, affirmative and negative imperative clauses
display different verb forms, imperative verb forms, and present subjunctive verb forms respectively. Regarding clitic position, the former feature post-verbal clitics while the latter present pre-verbal clitics (Ezeizabarrena, 1997). Therefore, negative phrases determine whether imperative clauses will display either an imperative verb form featuring a post-verbal clitic, if the negative phrase is not present, or a surrogate or suppletive form with a pre-verbal clitic, if the negative phrase is present. The acquisition of the position of the clitics hosted by these two verb forms may be the least morphological and most purely syntactic aspect under examination in this study; therefore, according to previous proposals focusing on the difficulty to acquire morphology, it should be the most challenging.

In sum, this section presents the main motivation for conducting this dissertation study. It aims to provide meaningful insights on the acquisition of different syntactic features, which differ in how much morphology is involved in each of them, with the goal to generate a discussion with previous proposals focusing on the difficulty to acquire morphology as opposed to purely syntactic operations.

3.8. Summary

This chapter discussed theories on heritage language acquisition and second language acquisition, as well as how lexical frequency has an impact on the acquisition of morphosyntactic properties. Also, this chapter presented the differences English and Spanish imperatives with respect to their morphosyntactic properties, narrowing down the aspects that English-speaking learners need to grasp in the process of acquiring Spanish imperatives. Additionally, previous studies on the acquisition of Spanish
imperatives, mostly on child acquisition, have been discussed, as well as some theoretical motivations behind the study. The research questions of the current study are guided by the theoretical accounts adopted in this chapter, the morphosyntactic properties in which Spanish and English differ, and the role of lexical frequency in the acquisition of morphosyntax.
Chapter 4

Dissertation study

4.1. Introduction

Previously, Chapter 2 has presented a definition of imperatives as well as some of their universal characteristics across languages. Additionally, it discussed two syntactic accounts for some features displayed by imperatives in Spanish. On the other hand, Chapter 3 has discussed proposals on second and heritage language acquisition that are to be tested in the present study, as well as previous studies on the acquisition of Spanish imperatives and the theoretical motivation for conducting this dissertation study.

The motivation for this dissertation study stems from previous proposals suggesting that syntax is acquired earlier than morphology. In order to test these proposals, the present study examines the knowledge of syntactic and morphological properties of imperatives in Spanish among second language learners and heritage speakers. Specifically, this study looks at the acquisition of subject-verb agreement involving addressee and number features (tú, vos ‘singular you’ vs. ustedes, vosotros ‘plural you’, ‘you guys’, ‘you all’) in imperative sentences (19a, 19b) and of surrogate or suppletive forms in negative imperatives (20):

(19)  a. ¡Salt-a!
   Jump-IMP.2.S
   ‘Jump!’

    b. ¡Salt-en!
   Jump-IMP.2.Pl
   ‘Jump!’
It also focuses on the acquisition of clitic position in affirmative imperative expressions with true or dedicated imperative verb forms (21a) and with surrogate or suppletive forms (21b):

(21)  a.  ¡Lláma-lo!
   Call-IMP.2.S-CL.M.3.S
   ‘Call him!’

   b.  ¡No lo llam-es!
   NEG   CL.M.3.SG   call-SUBJ.2.S
   ‘Do not call him!’

The selection of these specific phenomena derives from their differences in how purely syntactic they are or how much morphological instantiation occurs in them. As presented in Chapter 3, subject-verb agreement in number involves less syntactic knowledge than the use of surrogate or suppletive verb forms, which originate from a blocked raising to the CP layer. On the other hand, the acquisition of clitic position is purely syntactic. The study of these phenomena may provide insights on what language components are acquired earlier or with less difficulty.

Additionally, this study examines the impact of extra-linguistic factors, such as proficiency in Spanish, patterns of language use and exposure, and age of onset of acquisition of Spanish and English, in the acquisition of the aforementioned
morphological and syntactic properties. Finally, the current study also explores the role of lexical frequency in the knowledge of morphology and syntax in Spanish.

In order to provide participants with opportunities to exhibit their production skills and receptive grammatical knowledge, this dissertation included tasks eliciting production and grammaticality judgments among heritage speakers and second language learners. Contrasting the participants’ production skills and receptive grammatical knowledge is necessary because it provides a clearer picture of their acquisition. Specifically, acquisition outcomes present asymmetries in the sense that within-subject variability can be found. For instance, in this study, participants may not be able to produce the morphological instantiation of subject-verb agreement but have the receptive grammatical knowledge to determine whether or not a clause including such phenomenon is grammatical. Furthermore, this study investigates the role of lexical frequency in the knowledge of the phenomena under examination. I gather lexical frequency measures from both corpora (Davies, 2018) and participant reports with the goal to determine which is more suitable for different populations, given that the input to which heritage speakers are exposed may not be properly represented by corpora. This chapter presents the research questions that guide the current study.

This chapter also provides a detailed description of the participating sample and a discussion on the methodology employed in the current dissertation study. It is organized as follows: First, I present the research questions and hypotheses that guide this dissertation study. Second, I provide a detailed description of the participant groups focusing on between-group differences: age of acquisition of Spanish and age of acquisition of English, proficiency in Spanish and English, and self-reported patterns of
use and exposure to Spanish and English in their daily lives. Third, I present the tasks that were implemented, as well as a thorough description of each of them, both screening and experimental, and how they respond to the research questions. The following section explains the procedures followed when administering the tasks. The last section describes how the collected data were analyzed.

4.2. Research questions

Imperative clauses are one of the three main clause types across languages along with declaratives and interrogatives (Sadock & Zwicky, 1985). Imperative verbs feature unique morphology in many languages of the world, including Spanish (Alcázar & Saltarelli, 2014). However, despite their frequency in the input and their unique syntax and morphology, the acquisition of the Spanish imperatives is still underexplored. Previous research investigating the acquisition of the Spanish imperative has mostly focused on child language acquisition: in child monolinguals (Gathercole, Sebastián & Soto, 1999; 2002) and bilingually raised children (Ezeizabarrena, 1997; Grinstead, 1998, 2000). To my knowledge, no studies have looked at the acquisition of Spanish imperatives among English-speaking heritage speakers and second language learners. The comparison between the acquisition of these two bilingual populations may help determine the role of age of onset of acquisition in Spanish imperatives.

The study of the acquisition of imperatives in Spanish provides us with the opportunity to gather insights on the acquisition of syntactic features: addressee features hosted in the CP layer, number features, and person features. These three features are morphologically instantiated syncretically. As discussed in Section 3.7 above, the present study focuses on the acquisition of three properties of Spanish imperatives with different
levels of morphological instantiation. The study of the acquisition of these properties among English-dominant speakers will allow to tease apart which language components are acquired earlier or present less difficulty for heritage and second language speakers.

First, this dissertation study examines the acquisition of the checking of addressee, person and number features and how these features are morphologically instantiated in subject-verb agreement. This property involves syntactic operations and morphological knowledge. Second, the acquisition of the distribution of true imperative forms and surrogate or suppletive forms in imperative clauses is also an object of study of this dissertation. True imperative verb forms raise to check syntactic operators in the CP layer, but negative phrases block this verb movement and require the use of a surrogate or suppletive form instead. The acquisition of this property implies syntactic and morphological knowledge. Finally, the acquisition of clitic position relies on the presence of negative phrases in imperative clauses given that their position is determined by the verb that hosts them. In the case of imperative clauses, imperative verb forms feature post-verbal clitics or enclisis while surrogate or suppletive verb forms (i.e., present subjunctive) feature pre-verbal clitics or proclisis. This last property requires syntactic knowledge, but it is not as morphologically rich as the ones presented above.

All the phenomena described above are related in that they all require that features are checked in the CP layer. Rivero and Terzi (1995) referred to these as Imperative logical mood features in the Imperative mood operator while Alcázar and Saltarelli (2014) referred to Illocutionary Force (IF) when discussing the features that need to be checked in the CP layer for a sentence to convey directive meaning. The addressee features projected in the CP layer are the main features involved in imperative
clauses. Addressee features are expressed syncretically along with number and person. These three features are morphologically expressed on verbal agreement through two morphological forms, singular and plural respectively. Given the tight relation between syntax and morphology in Rivero and Terzi’s (1995) and Alcázar and Saltarelli’s (2013) proposals, only these two true or dedicated imperative verb forms which express addressee, number, and person features can check addressee features in the CP layer.

Finally, the examination of the acquisition of surrogate verb forms and clitic placement allows us to discern whether heritage and L2 learners of Spanish move dedicated or true imperative verb forms to the CP layer. If they do so, clitics will appear in enclitic position after dedicated or true imperative verb forms. Additionally, negation should block the movement of imperative verb forms to the CP layer resulting in the use of a surrogate form with different syntactic features regarding the attachment of clitics to verb forms.

On the other hand, English, the dominant language of the participants belonging to experimental groups in this study, does not display any dedicated morphology for imperatives. Instead, imperative verb forms in English consist in the bare form of the verb. In contrast with Spanish, the bare verb in imperative clauses in English does not need to check any features in the CP layer; therefore, such bare verb is not raised. Also, imperatives in English do not feature surrogate or suppletive forms are needed, which results in clitics being attached always in enclitic position, as in non-imperative clauses.

The process through which English-speaking heritage speakers and second language learners are expected to acquire imperatives in Spanish, as well as several between-group and within-group factors, guide the research questions of the present study.
All phenomena investigated in this study occur in imperative clauses (in affirmative and negative contexts) in opposition to extended or hortative imperatives, but are of different nature: first, the morphological instantiation of number, an interpretable feature; second the distribution of two verb paradigms, which responds to syntactic operations and morphological knowledge, and last, clitic position in those two verb paradigms, which involves purely syntactic operations. Previous research has documented that comparable phenomena present difficulties to be acquired by heritage speakers or second language learners: acquisition of structures involving interpretable features (Guijarro-Fuentes, 2012; Montrul & Sánchez-Walker, 2013) and purely syntactic structures (Cuza, 2012; Cuza & Frank, 2011;). By bearing these claims in mind, I pose this research question:

1. Does the acquisition of syntactic and morphological properties of the Spanish imperatives among English-speaking heritage speakers and second language learners of Spanish, as shown in their production and their receptive grammatical knowledge, show a pattern of order in the acquisition of syntax and morphology?

Following previous work on second language acquisition (Jiang, 2000; Lardiere, 2008, 2009) and heritage language acquisition and maintenance (Putnam & Sánchez, 2013), it is hypothesized that English-speaking heritage speakers and second language learners of Spanish, as opposed to the comparison groups (Spanish-dominant bilinguals for the heritage speakers and Spanish instructors for the L2 learners), are in the process of acquiring the morphological and syntactic properties of the Spanish imperative, as shown in the variability in both their production and comprehension of the three phenomena under examination. In their acquisition process, purely syntactic operations are acquired
earlier than those properties that involve morphological knowledge. The comparison groups are composed of Spanish-dominant Spanish-English bilinguals and Spanish instructors. These groups are to be compared with heritage speakers and second language learners because they represent their main sources of input.

In order to provide an answer to the first research question, a series of fine-grained research questions tackling each property under examination need to be posed. The first property under examination is the morphological instantiation of the addressee, person and number features. Among these features, the feature number is not instantiated in the verb paradigm of imperatives in English. It is present, sometimes, in the subject pronoun (‘you’ vs. ‘you guys’ or ‘you all’), which is realized in imperative clauses responding to pragmatic factors (Aikhenvald, 2010; Postdam, 1998). The examination of this particular property is tackled by this research question:

1a. Do English-speaking heritage speakers and second language learners of Spanish have knowledge of the morphological and syntactic properties of the Spanish imperatives, particularly of the syntactic features number, person and addressee, instantiated in verb morphology, as shown in their production and their receptive grammatical knowledge?

Given the lack of morphological instantiation of the features number, person and addressee in imperatives in their dominant language, it is hypothesized that English-dominant bilinguals encounter difficulties to consistently activate these features for production or comprehension purposes (Lardiere, 2008, 2009; Putnam & Sánchez, 2013). Particularly, I hypothesize that English-speaking heritage speakers and second language learners of Spanish are in the process of acquiring the features number, person and addressee as well as their morphological instantiation, given the expected variability in
the experimental groups’ production and comprehension of the features under examination as opposed to the consistent results to be shown by the comparison groups. The comparison groups are Spanish-dominant Spanish-English bilinguals and Spanish instructors, for the heritage speaker group and the second language learner group respectively. These groups were selected given that they would resemble the experimental groups’ sources of input. This hypothesis follows previous proposals on second language acquisition (Jiang, 2000; Lardiere, 2008, 2009) and heritage language acquisition and maintenance (Putnam & Sánchez, 2013).

The second property under examination is the distribution of true imperative verb forms and surrogate or suppletive verb forms. Their distribution is determined by their different syntactic properties (Alcázar & Saltarelli, 2014; Rivero & Terzi, 1995). On the one hand, true imperative verb forms raise to the CP layer to check the syntactic operator in charge of conveying directive meaning. On the other hand, surrogate or suppletive forms remain in a lower position as a result of a negative phrase blocking the verb movement to the CP layer. The surrogate or suppletive verb form in negative imperative clauses, the present subjunctive in Spanish, remains under the negative phrase and displays the same syntactic and morphological properties as the present subjunctive verb forms in other clauses. In English, this contrast does not exist. Additionally, previous studies on the acquisition of imperatives in Spanish among children report that the appearance of the first surrogate or suppletive forms occur after the age of 2;00 (2;06 for Ezeizabarrena, 1997; 2;01 or 2;02 for Fernández Martínez, 1994; 2;03 for Gathercole et al., 1999; not present in the data for Grinstead, 1998) and is not adult-like until the age of
3;0 (Ezeizabarrena, 1997). The study of this second property is addressed by this research question:

1b. Do English-speaking heritage speakers and second language learners of Spanish have knowledge of the distribution of imperative verb forms, which appear in canonical imperative clauses, as opposed to surrogate or suppletive forms, which appear in negative imperative clauses, as shown in their production and their receptive grammatical knowledge?

Given the lack of surrogate or suppletive forms in the dominant language of the bilinguals and their late acquisition among native speakers, I hypothesize that English-dominant bilinguals are still in the process of re-assembling the syntactic features to their corresponding morphological forms for production or comprehension purposes (Lardiere, 2008, 2009; Putnam & Sánchez, 2013). As for the research questions above, I also hypothesize that the heritage speakers and the second language learners are in the process of acquiring the syntactic and morphological properties of the Spanish imperatives. Specifically, they are acquiring the syntactic properties that determine the distribution of verb paradigms in Spanish imperative clauses (either true or surrogate verb forms) as well as the morphology of such verb paradigms. This acquisition process is evidenced in their production and receptive grammatical knowledge, which shows a considerable degree of variability, as opposed to the knowledge shown by the comparison groups (Spanish-dominant bilinguals for the heritage speakers and Spanish instructors for the L2 learners). This hypothesis is consistent with previous work on second language acquisition (Jiang, 2000; Lardiere, 2008, 2009) as well as heritage language acquisition and maintenance (Putnam & Sánchez, 2013).
The third property under examination is the distribution of clitic position, which is determined by the syntactic properties of the verb form hosting the clitic: true or dedicated imperative verb forms host clitics in post-verbal position (i.e., enclisis), while surrogate or suppletive verb forms host clitic in pre-verbal position (i.e., proclisis) (Ezeizabarrena, 1997; Rivero & Terzi, 1995; Rivero, 1994). It is argued that true imperative verb forms raise to the CP layer to check imperative features and, therefore, the clitic that it may host remain in postverbal position, whereas surrogate or suppletive verb forms, on the other hand, remain in a lower position and host clitics in preverbal position (Alcázar & Saltarelli, 2014; Rivero & Terzi, 1995; Rivero, 1994). Considering that the distribution of verb paradigms is determined by the presence of negation in the imperative clause, canonical imperatives feature enclisis, while negative imperatives or prohibitions feature proclisis. The examination of the acquisition of this syntactic operation is approached by this research question:

1c. Do English-speaking heritage speakers and second language learners of Spanish have knowledge of the distribution of post-verbal clitics, hosted by imperative verb forms, as opposed to pre-verbal clitics, hosted by surrogate or suppletive forms, as shown in their production and their receptive grammatical knowledge?

Given the lack of this phenomenon in English and following previous work on second language acquisition (Jiang, 2000; Lardiere, 2008, 2009) and heritage language acquisition and maintenance (Putnam & Sánchez, 2013), I hypothesize that the experimental groups are acquiring the syntactic properties of the two verb forms used in imperative clauses in Spanish, specifically whether they host clitics in pre- or post-verbal position. This is to be shown by their results in production and comprehension tasks,
which show variability, as opposed to the comparison groups’ results. The comparison groups are composed of Spanish-dominant Spanish-English bilinguals and Spanish instructors. The former are compared with the heritage speakers while the latter are contrasted with second language learners, as they resemble the experimental groups’ main sources of input in Spanish.

Putnam and Sánchez (2013) claim that the activation of the heritage language for production and comprehension purposes is tightly related to heritage language maintenance and, therefore, proficiency in the heritage language. Extra-linguistic factors such as the amount of exposure to the heritage language or age of onset of acquisition of the dominant language also have an impact on how frequently the heritage language is activated for production and comprehension purposes. For L2 learners, the activation of their second language is also correlated with their second language proficiency and automaticity (De Carli, Dessi, Mariani, Girtler, Greco, Rodriguez, Salmon, & Morelli, 2015; Gollan et al., 2008; Paradis, 1993) and, therefore, their performance in tasks examining production and comprehension. Segalowicz and Gatbonton (1995, p. 134) define automaticity as “the economical restructuring of underlying processing mechanisms”, which enhances their second language performance. Following these approaches on heritage/second language activation, which impacts other factors such as proficiency and patterns of language use and exposure, I investigate whether these factors have an effect on the knowledge of morphological and syntactic properties in Spanish heritage and second language learners by posing the research question below:

2. Do extra-linguistic factors, such as patterns of language use and exposure, proficiency in Spanish, and age of onset of acquisition of Spanish/English, have an effect on the
knowledge of the morphological and syntactic properties of the imperatives in Spanish among heritage speakers and second language learners? To what extent?

Following the approaches above on the effects of second/heritage language activation on proficiency, automaticity, and performance, I hypothesize that language activation, as measured by patterns of language use and exposure, enhance the knowledge of the morphological and syntactic properties of the Spanish imperatives under examination. Given the tight relation between language activation and language proficiency, I hypothesize that proficiency in the heritage/second language also enhances the knowledge of the morphological and syntactic properties of the Spanish imperatives. Previous research has documented that activation and proficiency in the second language or heritage language are positively correlated with the acquisition of syntactic operations involving interpretable features (Guijarro-Fuentes, 2012; Montrul & Sánchez-Walker, 2013), of structures at the syntax-pragmatics interface (Clements & Domínguez, 2017), and of purely syntactic operations (Cuza & Frank, 2011; Hawkins & Casillas, 2008; Hopp, 2017).

Similarly, the amount of activation in the heritage/L2 language is related to the age of onset of bilingualism as bilinguals, particularly in heritage speakers, as the use and exposure of their heritage language drop when they acquire their second and dominant language. Therefore, I hypothesize that age of onset of bilingualism has an effect on the knowledge of the properties of the Spanish imperatives under examination. Previous research has found that, among heritage speakers, age of onset of acquisition of English has an effect on the acquisition of morphosyntactic properties in Spanish (Giancaspro, 2017; Montrul, 2002; Montrul, Davidson, de la Fuente & Foote, 2014; Pascual y Cabo &
Gómez-Soler, 2015). Likewise, age of onset of acquisition of Spanish also plays a role in the acquisition of Spanish morphosyntax in L2 learners (Cuza & Frank, 2015; Cuza & López Otero, 2016; Montrul, 2010a; Montrul, 2010b; Montrul, 2011; Montrul, Foote & Perpiñán, 2008b).

Finally, the third main research question investigates the role of lexical frequency in heritage language and second language acquisition. Lexical frequency has been found to have an impact on the performance of both second language learners (Ellis, 2002; Ellis & Collins, 2009, *inter alia*) and heritage speakers (Giancaspro, 2017; Hur, forthcoming). Following Giancaspro (2017) and Hur (forthcoming), it can be argued that lexical frequency serves as an operationalized proxy for activation approaches to heritage language acquisition and maintenance (Putnam & Sánchez, 2013): high frequency lexical items are assumed to be more frequently activated for production and comprehension purposes and, therefore, facilitate the re-assembly of features necessary for production and comprehension purposes. This dissertation study’s third research question addresses this phenomenon:

3. What is the impact of lexical frequency on the bilinguals’ performance in production and receptive grammatical knowledge of imperatives in Spanish?

Consistently with previous proposals (Putnam & Sánchez, 2013) and previous work on the matter in both heritage speakers (Giancaspro, 2017; Hur, forthcoming) and second language learners (Ellis, 2002; Ellis & Collins, 2009, *inter alia*), in the present study, I hypothesize that lexical frequency modulates the performance in production and receptive grammatical knowledge of imperatives in Spanish. This is to be shown by less
variable results in those items containing lexical items which appear more frequently in the input in comparison with the comparison groups’ responses.

The research questions and their respective hypotheses discussed above led the choice of the screening tasks, as well as the choice and the design of the experimental tasks of the current study. Also, the research questions and hypotheses guide the discussion section. The following sections provide a detailed description of the participants, tasks, and procedures employed in this study.

4.3. Participants

Eight participant groups took part in the study. The recruitment of participants took place at a large public university in the Northeastern region of the United States. The recruitment process for the participants in the current study was carried out by visiting classrooms, displaying recruitment flyers on campus, and using snowball sampling. This process followed a purposive sampling technique, which involved selecting subjects following specific criteria instead of randomly (Tashakkori & Teddlie, 2003). Participants were recruited according to their language background; they needed to be Spanish-English bilinguals and were assigned a group depending on their dominant language, their Spanish proficiency as measured by the DELE test, and their age of onset of acquisition of Spanish. The participants were expected to take around one hour to complete all questionnaires, and tasks for this study, divided into written and oral components. They were given $10 upon completion as compensation for their participation.

There are six experimental groups, which are composed of non-dominant Spanish speakers. On the one hand, low-proficient heritage speakers of Spanish ($n = 12$),
intermediate heritage speakers of Spanish (n = 12), and advanced heritage speakers of Spanish (n = 34), all of whom had been exposed to Spanish since birth. On the other hand, low-proficient second language learners of Spanish (n = 18), intermediate second language learners of Spanish (n = 16), and advanced second language learners of Spanish (n = 17) were all English-Spanish bilinguals who acquired Spanish after their childhood.

Following previous studies (Hopp & Schmid, 2013; Pascual y Cabo & Rothman, 2012; Perez-Cortes, 2016; Schmid & Hopp, 2014), I decided to use two different comparison groups for the heritage speakers and the L2 learners, respectively, in order to guarantee that the participants in the experimental groups were compared with an input similar to that to which they are exposed. The two comparison groups are the Spanish-dominant bilinguals group (n = 12) and the Spanish language instructors’ group (n = 20). The former are Spanish-English bilinguals whose dominant language is Spanish and who acquired Spanish since birth and English as a second language. This group comes from the same areas as the heritage speakers in the experimental groups and represents the main source of input that heritage speaker participants receive at home and in other social interactions. On the other hand, the Spanish language instructors are highly proficient in Spanish, but their dominant language and age of onset of acquisition of Spanish are irrelevant to this study. Some participants in the Spanish instructors’ group may not be dominant in Spanish; indeed, some may even be dominant in English or another language. However, they represent the main source of input that the participants in the L2 learners’ group receive in the classroom, as they were recruited at the institution that the non-dominant second language speakers of Spanish were attending at the moment of the
data collection. Table 3 below summarizes the information of the participant groups in the study.

Table 3. Summary of participants’ group information

<table>
<thead>
<tr>
<th>Group</th>
<th>No. of participants</th>
<th>Dominant language</th>
<th>DELE score</th>
<th>AoA of Spanish</th>
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<td>Low-proficient HS</td>
<td>12</td>
<td>English</td>
<td>20-29</td>
<td>Since birth</td>
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<tr>
<td>Intermediate HS</td>
<td>12</td>
<td>English</td>
<td>30-39</td>
<td>Since birth</td>
</tr>
<tr>
<td>Advanced HS</td>
<td>34</td>
<td>English</td>
<td>40-50</td>
<td>Since birth</td>
</tr>
<tr>
<td>Low-proficient L2</td>
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</tbody>
</table>

In order to create the groups presented above, I relied on overall Spanish proficiency, age of onset of acquisition of Spanish and English, and language dominance. On the other hand, the Spanish instructors’ group is composed of bilinguals who teach Spanish at the university where the second language speakers were taking Spanish courses. The dominant language of the Spanish instructors may or not be Spanish. I
determined the factors above by administering a proficiency test and language background questionnaires, described in detail in the section below.

4.3.1. Demographic information

All participants completed a background language questionnaire: the L2 learners completed the Language Experience and Proficiency Questionnaire (LEAP-Q) (Marian, Blumenfeld, & Kaushanskaya, 2007) while the other groups completed the Language Background Questionnaire for Heritage Speakers (adapted from Pérez-Cortés, 2016). As described in the next section, these questionnaires gathered information about the participants’ linguistic histories, patterns of language use and exposure, and self-reported proficiency, among others. This section presents the most relevant participants’ information obtained from the questionnaires.

Participants from the heritage speaker group (n = 58) were mostly female (42 female vs 16 male) college students (age range = 18-46; M = 22.72; SD = 5.17). Most of the heritage speakers were sequential bilinguals (24 sequential vs 34 simultaneous), having acquired Spanish since birth and English later in their childhood (age of acquisition of English range = 3-10; M = 5.58; SD = 2.16). The heritage speakers were exposed to many different Spanish varieties at home: 19% of the heritage speakers’ participants spoke Mexican Spanish, followed by the varieties from Ecuador (14%), Colombia (12%), Cuba (10%), Dominican Republic (9%) and Peru (9%). Other varieties to which the heritage speakers were exposed from their parents were those from Puerto Rico, El Salvador, Guatemala, Central America, Chile, Panama, the United States, Spain, and the Philippines. A portion of the heritage speakers (21%; n = 12) was exposed to
different Spanish varieties from each of their parents while some heritage speakers \((n = 2)\) were exposed to Spanish from one parent and to another language from the other.

Regarding their patterns of language exposure and use, the heritage speakers favored the use of their dominant language, English, over their heritage language, Spanish, in all contexts except for communicating with their parents. Table 4 below shows the heritage speakers’ language preference in different contexts:

Table 4. Heritage speakers’ language preference in different contexts

<table>
<thead>
<tr>
<th>Context</th>
<th>Use of Spanish</th>
<th>Use of English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parents</td>
<td>(M = 65.32; SD = 32.15)</td>
<td>(M = 33.29; SD = 31.61)</td>
</tr>
<tr>
<td>Sibling(s)</td>
<td>(M = 17.49; SD = 24.93)</td>
<td>(M = 84.32; SD = 22.31)</td>
</tr>
<tr>
<td>Partner(s)</td>
<td>(M = 17.06; SD = 29.89)</td>
<td>(M = 78.38; SD = 34.33)</td>
</tr>
<tr>
<td>Work</td>
<td>(M = 19.86; SD = 23.79)</td>
<td>(M = 78.24; SD = 25.88)</td>
</tr>
<tr>
<td>School</td>
<td>(M = 23.39; SD = 19.61)</td>
<td>(M = 78.15; SD = 17.01)</td>
</tr>
<tr>
<td>Reading</td>
<td>(M = 23.44; SD = 19.71)</td>
<td>(M = 78.10; SD = 17.13)</td>
</tr>
<tr>
<td>Watching TV</td>
<td>(M = 30.86; SD = 19.70)</td>
<td>(M = 70.68; SD = 17.79)</td>
</tr>
<tr>
<td>At stores</td>
<td>(M = 15.86; SD = 17.65)</td>
<td>(M = 83.96; SD = 17.54)</td>
</tr>
<tr>
<td>Total average</td>
<td>(M = 26.66; SD = 16.35)</td>
<td>(M = 73.14; SD = 16.64)</td>
</tr>
</tbody>
</table>
Participants were asked to distribute in percentages the use of their languages in the given contexts. Some participants did not have siblings or partners; therefore, they did not provide any information on the language that they used in such contexts. Also, some participants did not distribute all their language use and exposure between Spanish and English because they used other heritage languages, namely Galician and Brazilian Portuguese.

Participants from the L2 learner group (n = 51) were also mostly female (37 female vs 14 male) and comparable in age to the heritage speaker group (age range = 18-54; M = 21.90; SD = 7.18) as most of them were college students also. English was all L2 learners’ native and dominant language. Their age of onset of acquisition of Spanish is very heterogeneous (age of onset of acquisition of Spanish range = 4-22, M = 11.15; SD = 4.95); however, they did not reach fluency until years later (age of onset of fluency in Spanish = 9-30; M = 17.64; SD = 3.89). The richness of the linguistic landscape of the area where the data were collected is reflected in the heritage languages of the L2 learners; although English was all of the L2 learners’ native and dominant language, 43% of the L2 learners (n = 22) spoke at least one heritage language. The most common heritage languages spoken by the L2 learners were Hindi (n = 6), Gujarati (n = 6), and Korean (n = 4). Other heritage languages spoken by the L2 learners included Bangla, Tagalog, Mandarin, Arabic, Kannada, Tamil, Urdu, Punjabi, Marathi, Telugu, German, and Russian.

As the heritage speakers, the L2 learners also favored the use of English (M = 78.84; SD = 16.00) over Spanish (M = 13.88; SD = 12.90). When asked to rate how much they used Spanish in different contexts using a 0-10 Likert scale, the L2 learners showed
low use of Spanish in most contexts: friends ($M = 2.48; SD = 2.56$), family ($M = 1.02; SD = 2.02$), TV ($M = 2.66; SD = 2.27$), radio or music ($M = 4.03; SD = 2.81$), reading ($M = 4; SD = 2.81$), and language-learning application ($M = 2.24; SD = 2.67$). The exposure to Spanish through reading and radio or music being slightly higher than in other contexts reflects the instruction-based nature of the L2 learners’ Spanish acquisition process.

The Spanish-dominant bilinguals ($n = 13$), who serve as a comparison group to the heritage speakers, were mostly female (9 female vs 4 male) (age range = 21-48; $M = 37; SD = 7.82$). They all acquired Spanish since birth and learned English in their childhood or later (age of onset of acquisition of English range = 5-25; $M = 11.15; SD = 6.34$). As the heritage speakers, the Spanish-dominant bilinguals spoke different Spanish varieties: Colombian Spanish was the most spoken variety ($n = 3$), followed by the Spanish from Venezuela ($n = 2$), Mexico ($n = 2$), and the Dominican Republic ($n = 2$). There were also speakers of Spanish from Peru, Ecuador, Puerto Rico, and Spain.

Their patterns of language use and exposure did not always favor Spanish; indeed, they only favored the use of Spanish with their parents ($M = 100; SD = 0$ for Spanish vs $M = 0; SD = 0$ for English), siblings ($M = 87; SD = 21.62$ for Spanish vs $M = 13; SD = 21.62$ for English), and partners ($M = 63; SD = 34.00$ for Spanish vs $M = 37; SD = 34.00$ for English). In the remaining contexts, they favored English over Spanish: at work ($M = 31.53; SD = 32.81$ for Spanish vs $M = 68.07; SD = 32.50$ for English), at school ($M = 45; SD = 28.12$ for Spanish vs $M = 55; SD = 28.12$ for English), when reading ($M = 38.84; SD = 26.46$ for Spanish vs $M = 61.15; SD = 26.46$ for English), when watching TV ($M = 17; SD = 18.47$ for Spanish vs $M = 83; SD = 18.47$ for English), and at stores ($M = 13.84; SD = 14.31$ for Spanish vs $M = 86.15; SD = 14.31$ for English).
The group of Spanish instructors \((n = 20)\) was also composed mostly by females (14 female vs 6 male) (age range = 25-40; \(M = 30.9; \ SD = 4.27\)). Most of them were native speakers of Spanish (70\%; \(n = 14\)) while the others were native speakers of English with the exception of one native speaker of Korean. The native speakers of Spanish spoke different varieties, Peninsular Spanish being the most common \((n = 6)\), followed by Spanish from Peru \((n = 2)\), and Mexico \((n = 2)\). There were also speakers of Spanish from Colombia, Argentina, and Cuba. The instructors whose native language is not English started learning it in their childhood or teenage years (age of onset of acquisition of English age = 3 – 12; \(M = 7.23; \ SD = 2.68\)). It is noteworthy to mention that two instructors are heritage speakers of Spanish who acquired their heritage language and English simultaneously.

Given the diversity in the instructors’ group, their patterns of language use and exposure are different from those featured by the other groups. Notably, they favor Spanish over English at work \((M = 57.5; \ SD = 9.66\) for Spanish vs \(M = 42.5; \ SD = 9.66\) for English) and at school \((M = 55.75; \ SD = 12.06\) for Spanish vs \(M = 44.25; \ SD = 12.06\) for English). Like the Spanish-dominant bilinguals, they also prefer to use Spanish with their parents \((M = 65; \ SD = 46.16\) for Spanish vs \(M = 30; \ SD = 44.12\) for English) and with their siblings \((M = 57.75.84; \ SD = 48.67\) for Spanish vs \(M = 44.75; \ SD = 47.66\) for English). On the other hand, the instructors favored English in all other contexts: with their partner \((M = 42.85; \ SD = 45.98\) for Spanish vs \(M = 50; \ SD = 46.57\) for English), when reading \((M = 37.5; \ SD = 20.80\) for Spanish vs \(M = 62.5; \ SD = 20.80\) for English), when watching TV \((M = 29.25; \ SD = 23.46\) for Spanish vs \(M = 65.75; \ SD = 27.25\) for English).
English), and at stores ($M = 9.25; SD = 20.34$ for Spanish vs $M = 90.5; SD = 20.31$ for English).

This section has presented linguistic and demographic information on the four groups that participated in this study. Most participants in all groups were female. Also, the heritage speakers and the L2 learners are comparable in age but younger than their comparison groups, namely the Spanish-dominant bilinguals and the Spanish instructors. Finally, this section has presented the linguistic diversity in all groups: native speakers of Spanish speak a myriad of different Spanish varieties while many of the L2 learners are heritage speakers of other languages. Finally, their patterns of language use and exposure show that English is favored by most speakers in most contexts except for native speakers of Spanish preferring Spanish to communicate with their family.

4.3.2. Language proficiency information

All participants completed an adapted version of the DELE, the MiNT in both Spanish and English, and a series of self-ratings on their Spanish and English skills. See the section below to find more information on these language proficiency tests. I relied on the participants’ DELE scores to categorize them in proficiency groups.

The group average score for the DELE in heritage speakers was higher than in L2 learners ($M = 39.22; SD = 7.73$ for the heritage speakers vs $M = 33.43; SD = 8.12$ for the L2 learners). The average scores were also higher for the heritage speakers group than for the L2 learners within each proficiency group: low proficiency (range = 21-29; $M = 26.41; SD = 2.15$ for heritage speakers vs range = 20-28; $M = 24.77; SD = 2.43$ for L2 learners), intermediate proficiency (range = 32-39; $M = 36.66; SD = 2.38$ for heritage speakers vs range = 30-37; $M = 32.93; SD = 2.71$ for L2 learners), and advanced
proficiency (range = 40-50; $M = 44.64; SD = 2.77$ for heritage speakers vs range = 40-48; $M = 43.23; SD = 2.19$ for L2 learners). The comparison groups only included advanced participants and their results were comparable (range = 47-50; $M = 48.84; SD = 0.89$ for Spanish-dominant bilinguals vs range = 48-50; $M = 49.1; SD = 1.02$ for Spanish instructors). Figure 11 below shows the DELE scores of the heritage speakers and L2 learners across DELE-based proficiency groups.

![DELE scores across proficiency groups in Heritage Speakers and L2 learners](chart.png)

Regarding the scores for the Spanish MiNT, the overall average score for heritage speakers was also higher than for L2 learners ($M = 45.4; SD = 11.1$ for the heritage speakers vs $M = 29.5; SD = 11.5$ for the L2 learners). Like in the DELE, scores within each proficiency group were also higher in heritage speakers: low proficiency ($M = 32.8; SD = 6.36$ for the heritage speakers vs $M = 21.6; SD = 5.41$ for the L2 learners), intermediate proficiency ($M = 37; SD = 5.39$ for the heritage speakers vs $M = 27.6; SD = 5.41$ for the L2 learners).
4.57 for the L2 learners), and advanced proficiency ($M = 52.8; SD = 7.17$ for the heritage speakers vs $M = 39.6; SD = 13.1$ for the L2 learners). The participants in the comparison groups, all of whom are advanced based on their DELE, scored high in their Spanish MiNT ($M = 64.8; SD = 1.88$ for the Spanish-dominant bilinguals vs $M = 62.7; SD = 5.15$ for the Spanish instructors). Figure 12 below shows the Spanish MiNT results of heritage speakers and L2 learners across proficiency groups.

With regard to the scores for the MiNT in English, the heritage speakers and L2 learners presented comparable results ($M = 62.3; SD = 3.96$ for the heritage speakers vs $M = 65.2; SD = 2.22$ for the L2 learners) while the comparison groups scored slightly lower results ($M = 55.7; SD = 6.62$ for the Spanish-dominant bilinguals vs $M = 60.6; SD = 6.67$ for the Spanish instructors). These scores reflect that the comparison groups were composed of Spanish-dominant bilinguals with the exception of some Spanish
instructors. For the sake of simplicity, the responses to the MiNT were considered correct if the participants gave a correct response regardless of having received a semantic or phonological cue.

The self-ratings on their Spanish skills seem to be consistent with the DELE-based proficiency groups. The L2 learners rated their comprehension skills (i.e., listening and reading) higher than their speaking skills in low-proficient ($M = 5.5; SD = 1.6$ for speaking, $M = 6.15; SD = 1.6$ for listening, and $M = 6.5; SD = 1.23$ for reading), intermediate ($M = 6.03; SD = 1.3$ for speaking, $M = 6.75; SD = 1.71$ for listening, and $M = 7.1; SD = 1.11$ for reading), and advanced participants ($M = 7.17; SD = 1.11$ for speaking, $M = 8.11; SD = 0.85$ for listening, and $M = 7.76; SD = 1.03$ for reading). Despite heritage speakers completed a different language background questionnaire, their self-ratings present similarities with the L2 learners’ in that they are consistent with DELE-based proficiency groups and that comprehension skills are rated higher than production skills. Low-proficient heritage speakers rated their skills lower than intermediate heritage speakers ($M = 6.04; SD = 1.44$ for speaking, $M = 7.31; SD = 1.70$ for listening, $M = 5.92; SD = 1.18$ for writing, and $M = 6.5; SD = 1.23$ for reading in low-proficient heritage speakers). The intermediate heritage speakers, in turn, rated their Spanish lower than the advanced group ($M = 6.22; SD = 2.65$ for speaking, $M = 8.35; SD = 1.55$ for listening, $M = 6.69; SD = 1.52$ for writing, and $M = 7.94; SD = 1.30$ for reading in intermediate heritage speakers). Finally, the advanced heritage speakers rated their Spanish language skills higher than the other groups ($M = 8.25; SD = 1.78$ for speaking, $M = 9.38; SD = 1.41$ for listening, $M = 8.06; SD = 1.62$ for writing, and $M = 8.76; SD = 1.23$ for reading in advanced heritage speakers).
This section has presented the criteria that candidates to participate needed to meet in order to take part in this study. Additionally, this section has introduced the criteria that were followed to assign participants to groups. Finally, this section has also described the methods that I followed to recruit the participants needed for the study.

4.4. Data collection instruments: design and procedures

In this section, I describe the tasks that I administered for this dissertation study. I administered a series of screening and experimental tasks, as well as the questionnaires and the DELE test. All tasks, questionnaires and tests were completed by the participants in person, either following a paper-and-pencil format for the case of the questionnaires, the DELE test, the Acceptability Judgment Task, and the Lexical Frequency Self-Rating Task, or orally for the case of the MiNT, the Narrative Task, and the Elicited Production Task, which were recorded for further transcription and analysis. The goal of the questionnaires and screening tasks was to guarantee the homogeneity of the experimental groups by controlling for confounding factors. The experimental tasks, on the other hand, aimed to collect data that provide meaningful insights on the research questions and hypotheses. The tasks that I used for data collection are listed below and are presented in the order in which they were administered to the participants:

1. Language background questionnaires:
   a. Language Experience and Proficiency Questionnaire (LEAP-Q), or
   b. Language Background Questionnaire for Heritage Speakers (adapted from Pérez-Cortés, 2016)

2. Screening Tasks:
3. Experimental Tasks:
   a. Narrative Task
   b. Elicited Production Task
   c. Acceptability Judgment Task
   d. Lexical Frequency Self-Rating Task

The questionnaires elicit information on the participants’ language background, patterns of language use and exposure, and self-reported proficiency in the languages they speak. The screening tasks, in turn, measure morphosyntactic and lexical proficiency. The experimental tasks tackle the research questions and hypotheses by eliciting the production and testing the receptive grammatical knowledge of imperatives in Spanish among the participants. The last experimental task gathers self-reported data on the lexical frequency of the lexical items tested beforehand.

4.4.1. Language background questionnaires

Participants were assigned groups according to information gathered through the use of language background questionnaires. Second language learners completed the Language Experience and Proficiency Questionnaire (LEAP-Q) (Marian, Blumenfeld, & Kaushanskaya, 2007) (See Appendix X). Heritage speakers, on the other hand, completed a Language Background Questionnaire for Heritage Speakers (LBQHS) (adapted from Pérez-Cortés, 2016) (See Appendix X).
Both questionnaires aim to obtain information about the participants’ language experience and use, age of onset of acquisition of the languages they speak, and self-reported proficiency in Spanish and other languages. This information, namely age of onset of acquisition of Spanish, determines whether one participant belongs in the group of heritage speakers or second language learners. Both questionnaires were available in both English and Spanish. The participants in this study were invited to complete it in their preferred language.

However, the two questionnaires presented some differences. The LEAP-Q focuses on the second language acquisition process. It asks relevant information about experiences and practices that might have an impact on the development of a second language. For instance, it inquires about travels to countries where the second language is spoken and asks participants to rate how important a series of factors have been for their learning process. These factors include interacting with friends, with family, reading, self-instruction, and watching TV or listening to the radio in the second language. On the other hand, the LBQHS pays particular attention to bilingual patterns of language use and exposure and follows Pérez-Cortés’s (2016) innovation to include questions on the amount of Spanish and English they use in different contexts. Specifically, the questionnaire asks which language, either Spanish or English, the participants prefer in eight contexts: with their parents, with their siblings, with their partner, at work, at school, when reading, when watching TV, and at stores and banks.

4.4.2. Screening tasks

This section presents the screening tasks and procedures that were used for the current study. First, the questionnaires, discussed above, elicit background language
information relevant to our research questions (e.g., age of onset of acquisition of Spanish, language use, etc.). Second, the DELE is a test containing 50 multiple-choice questions on lexical and morphosyntactic knowledge in Spanish. Its results can be used to measure participants’ proficiency in Spanish. The components of the study above, as well as the Acceptability Judgment Task, were completed following a paper-and-pencil format instead of orally in order to reduce the time that participants needed to be engaged in oral tasks and prevent them from being tired. Upon completion of these written components of the study, the investigator determined whether the subject was considered for participation or not given that eligibility was based on DELE score and language background: English-dominant English-Spanish bilingual, either heritage speaker of second language learner.

4.4.2.1. Diploma de Español como Lengua Extranjera (DELE) test

Following previous studies on proficiency and language acquisition (Cuza, Pérez-Leroux, & Sánchez, 2013; Bruhn de Garavito, 2002; Montrul & Slabakova, 2003), this study employed an adapted version of the test Diploma de Español como Lengua Extranjera (DELE) as a screening task to measure the proficiency across participants. Specifically, I used Cuza, Pérez-Leroux, and Sánchez’s (2013) version of the DELE. The proficiency groups were based on the participants’ results on the DELE.

Cuza, Pérez-Leroux, and Sánchez’s (2013) version of the DELE test is composed of 50 multiple-choice questions targeting lexical and morphosyntactic knowledge in Spanish. For the current study, a participant is considered to be advanced if they score over 40 points, intermediate if their score ranges from 30 to 39, and low-proficient if their score ranges from 20 to 29. The data from subjects scoring less than 20 points were not
considered. Measuring proficiency in Spanish across participants is meant to provide meaningful insights into the correlation between proficiency and the acquisition of the morphological and syntactic properties of imperatives in Spanish. This phenomenon is addressed by this dissertation study’s second research question, which inquires about the role of extra-linguistic factors such as Spanish proficiency, patterns of language use and exposure and age of onset of acquisition of Spanish and English in the acquisition of the syntactic and morphological properties of imperatives in Spanish. Indeed, it allows us to look at the development of the acquisition of the phenomena under examination across different proficiency levels.

4.4.2.2. Multilingual Naming Test

The second screening task that I administered is the Multilingual Naming Test (MiNT; Gollan, Weissberger, Runnqvist, Montoya, & Cera, 2012). The goal of this screening task is to assess the participants’ lexical knowledge, which has been found to be correlated to their overall proficiency (Bedore, Peña, Summers, Boerger, Resendiz, Greene, & Gillam, 2012; Gollan et al., 2012; Sheng, Lu, & Gollan, 2014; Treffers-Daller & Korybski, 2015). The MiNT was originally designed for speakers of any combination of Spanish, English, Mandarin, and Hebrew, as it does not present cognates across these languages. The test consists of 68 black-and-white images depicting items of increasing difficulty presented individually. The difficulty of retrieving the lexical item is controlled by lexical frequency: the lexical items in the test are presented in order from the most frequent to the least frequent, which gradually increases the difficulty to retrieve the lexical item in the picture. Subjects are asked to identify the items orally. In case they encounter any difficulty retrieving the lexical item, the test provides instructions on how
to facilitate the participants’ task by using semantic cues (e.g., a description of the item depicted in the picture) or phonological cues (e.g., the sound with which the lexical item starts). Below are shown samples of items depicted in the MiNT.

Item #3: Image of a tree

Expected response: ‘árbol’ (Spanish), and ‘tree’ (English)

Item #32: Image of a rainbow

Expected response: ‘arco iris’ (Spanish), and ‘rainbow’ (English)

This screening task was administered to all groups in both Spanish and English, first in their dominant language followed by their non-dominant language. The fact that, unlike the DELE, this task is not specific to Spanish allowed me to collect data on the lexical knowledge of English across all groups, which provides insights on the participants’ overall proficiency in English, on their language dominance as bilinguals, as well as on any signs of attrition in the Spanish of the Spanish-dominant bilinguals.

4.4.3. Experimental Tasks

In this section, I present the experimental tasks and the procedures that were followed for the current study: First, the Elicited Production Task (EPT) gathers data on the participants’ production skills in Spanish. Then, the Acceptability Judgment Task (AJT) measures the receptive grammatical knowledge of participants on the structures under examination. Finally, the Lexical Frequency Self-Rating Task (adapted from Okamoto, 2015) collects data on the participants’ intuition on how frequently they are exposed to a series of lexical items in the input they receive and the output they produce.
4.4.3.1. Elicited Production Task

In order to collect data on the participants’ production of the morphosyntactic properties of the imperatives in Spanish under examination, I used an Elicited Production Task (EPT) (Thornton, 1996). The EPT included items targeting to gather the participants’ production of the three phenomena examined in this study: subject-verb agreement verb morphology in number, in second person singular and plural, the use and distribution of true or dedicated imperative forms and surrogate or suppletive forms, as well as the use and distribution of clitics. These conditions were divided into two blocks that made up the task: the second block examined the use and distribution of clitics, while the first block examined the remaining conditions. The decision of separating one condition from the rest was taken in order to prevent priming effects, especially in the Acceptability Judgment Task. The verbs under examination in both blocks were selected following specific criteria: lexical frequency, verb class, number of syllables, regularity in verb morphology, and whether or not their English equivalent is a cognate. Additionally, all verbs depicted ‘controllable’ actions so that commands formulated with them would be pragmatically and semantically felicitous.

Following Giancaspro (2017) and Hur (forthcoming), this study considers lexical frequency to be closer to token frequency; lexical frequency is the count of how often a particular lexical item appears in the input. Davies’ (2018) Corpus del español is used as a proxy for the input speakers receive in Spanish, while the lexical frequency of each lexical item is a proxy for how often speakers activate such lexical item in their Spanish. Davies (2018) is 5.5-billion-word corpus from more than twenty Spanish-speaking countries that has been used as a proxy for frequency of activation within the frame of the
activation approach for heritage language acquisition and maintenance (Putnam & Sánchez, 2013). In addition to the Davies’ corpus, I collected participants’ self-ratings on the lexical frequency of the experimental verbs by administering a Lexical Frequency Self-Rating Task (LFSRT), described below. The results from the LFSRT were contrasted to the frequencies provided by Davies (2018). The results from the LFSRT and the raw frequency count of the verbs under examination were included into the statistical analyses as continuous fixed factors. For Davies (2018), raw frequency count, as token or lexical frequency, is the number of times that a given token appears in the corpus. Table 5 summarizes the raw frequencies of the experimental lexical items employed in the first block of the EPT in decreasing order.

Table 5. Raw frequencies from Davies’ (2018) *Corpus del español* for verbs in the first block of the EPT

<table>
<thead>
<tr>
<th>Lexical item</th>
<th>Raw Frequency Count</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tomar</strong> ‘take’, ‘drink’</td>
<td>999,786</td>
</tr>
<tr>
<td><strong>Subir</strong> ‘lift’ ‘upload’</td>
<td>260,987</td>
</tr>
<tr>
<td><strong>Mirar</strong> ‘look at’</td>
<td>171,472</td>
</tr>
<tr>
<td><strong>Parar</strong> ‘stop’</td>
<td>152,518</td>
</tr>
<tr>
<td><strong>Beber</strong> ‘drink’</td>
<td>60,452</td>
</tr>
<tr>
<td><strong>Batir</strong> ‘shake’</td>
<td>37,654</td>
</tr>
<tr>
<td><strong>Coser</strong> ‘sew’</td>
<td>9,098</td>
</tr>
<tr>
<td><strong>Mojar</strong> ‘wet’, ‘soak’</td>
<td>8,028</td>
</tr>
</tbody>
</table>
The verbs used in the second block, which included only the conditions looking at clitic use and distribution, were not heterogeneous in terms of lexical frequency. In order to facilitate the production of clitics for the participants, all verbs used in this condition were frequent and their raw frequency counts exceeded 100,000 in Davies’ (2018) *Corpus del español*. Table 6 summarizes the raw frequencies of the experimental lexical items employed in the second block of the EPT in decreasing order.

Table 6. Raw frequencies from Davies’ (2018) *Corpus del español* for verbs in the second block of the EPT

<table>
<thead>
<tr>
<th>Lexical item</th>
<th>Raw Frequency Count</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Dejar</em> ‘leave’, ‘abandon’</td>
<td>1,060,831</td>
</tr>
<tr>
<td><em>Buscar</em> ‘look for’</td>
<td>752,915</td>
</tr>
<tr>
<td><em>Ayudar</em> ‘help’</td>
<td>612,753</td>
</tr>
<tr>
<td><em>Llamar</em> ‘call’</td>
<td>287,625</td>
</tr>
<tr>
<td><em>Matar</em> ‘kill’</td>
<td>192,179</td>
</tr>
<tr>
<td><em>Echar</em> ‘throw’, ‘expel’</td>
<td>129,728</td>
</tr>
</tbody>
</table>

In addition to lexical frequency, verb class was also a criterion to consider when selecting the verbs for the experimental tasks. As addressed in Section 3.5, theme vowels have been argued to categorize stems and derivational suffixes in the lexicon (Bermúdez-Otero, 2013; Oltra-Massuet & Arregi, 2005). Aguirre and Dressler (2006) categorize inflectional verb morphology in Spanish into two macroclasses: the first macroclass is composed of Class I verbs (i.e., verbs in *-ar*) while the second macroclass is composed of Class II verbs (i.e., verbs in *-er*) and Class III verbs (i.e., verbs in *-ir*). The difference in
these classes derives from their theme vowel (i.e., $a$, $e$, or $i$), which organizes verb into three classes with different iconic and congruent inflectional morphology. The present study includes test items from all three classes: Class I, featuring the theme vowel $a$ (e.g., tomar, mojar), and Classes II and III, featuring respectively the theme vowels $e$ (e.g., comer, coser) and $i$ (e.g., subir, batir). All three classes are tested in order to examine the participants’ morphological knowledge across different regular inflectional morphological patterns.

In the first block of the EPT, all verb classes are present and, given that Class I is the most frequent, most verbs in the experimental tasks belong to Class I. Specifically, four verbs belong to Class I, two to Class II, and two to Class III. By looking at a range of regular verbs from all three classes, the current study targets the morphosyntactic properties under examination across the three inflectional classes in Spanish verbs and avoids confounding factors due to collecting data from only one inflectional class.

On the other hand, in the second block of the EPT, all verbs belong to Class I in order to render the production of clitics easier for non-dominant Spanish-speaking subjects. Additionally, all verbs in the experimental tasks are morphologically regular in order to avoid confounding factors, as regularity facilitates accuracy in non-native populations, at least in mood selection (Gudmestad, 2012, 2014; Pérez Cortés, 2016). Therefore, given that in Spanish the subjunctive is the form used as a surrogate or suppletive in negative imperatives, I opt to avoid including irregular verbs in the current study, as that might lead to confounding factors. Also, all verbs in the first block are disyllabic in order to prevent confounding factors related to different processing loads across verbs featuring different numbers of syllables. In the second block, all verbs are
also disyllabic except for one (ayudar ‘to help’). For consistency purposes, all verbs are transitive. Finally, the verbs included in the task do not have cognates in English in order to prevent having inconsistent levels of activation of English as the tasks were completed.

The EPT included five conditions across the two blocks. The first block, including three conditions (1-3 below), had 24 experimental items \(k = 8\), while the second block, which included two conditions (4-5 below), had 12 experimental items \(k = 6\). There were 32 distractors across the two blocks, which looked at the acquisition of subject-verb inversion with unaccusative and unergative verbs in Spanish. The five conditions under examination were:

1. Singular addressee in canonical imperative: ¡Toma! ‘Take!’
2. Singular addressee in negative imperative: ¡No tomes! ‘Do not take!’
3. Plural addressee in canonical imperative: ¡Tomen! ‘Take!’
4. Singular addressee in canonical imperative with clitic: ¡Déjalo! ‘Leave him!’
5. Singular addressee in negative imperative with clitic: ¡No lo dejes! ‘Do not leave him!’

The three variables that guide the design of the study (number of the addressee, presence of negation, and need for production of anaphoric clitic) were incorporated into the task by using vocatives and including the adverb ‘no’ in parentheses next to the verb under examination in the experimental tokens. Also, for the conditions examining clitic production, preambles presented a singular masculine and human direct object to which the participants needed to refer by using an anaphoric clitic in their response. Participants were shown a preamble along with a picture; then, they were presented with a prompt
with a gap which needed to be filled in by using the verb in parentheses, as shown in the examples below:

Examples of Elicited Production Task items.

1. Condition 1: Singular addressee in canonical imperative

   a. Preamble: *La mamá piensa que Antonio necesita tomar bastante calcio.*

      ‘The mom thinks that Antonio needs to have a lot of calcium.’

      ¿*Qué le dijo la mamá a Antonio?* ‘What did the mom tell Antonio?’

   b. Prompt: ¡*Antonio, (beber) un vaso de leche todas las mañanas!*’

      ‘Antonio, (drink) a glass of milk every morning!’

   c. Expected response: *bebe* ‘drink’

2. Condition 2: Singular addressee in negative imperative

   a. Preamble: *El doctor insiste que la soda no es buena para la salud de Carlos.*

      ‘The doctor insists that soda is not good for Carlos’s health.’

      ¿*Qué le dijo el doctor a Carlos?* ‘What did the doctor tell Carlos?’

   b. Prompt: ¡*Carlos, (no beber) soda!*’

      ‘Carlos, (not drink) soda!’

   c. Expected response: *no bebas* ‘do not drink’

3. Condition 3: Plural addressee in canonical imperative

   a. Preamble: *El jefe necesitaba tres empleados para mover una mesa al segundo piso.*

      ‘The boss needed three employees to move a table to the second floor.’

      ¿*Qué les dijo el jefe a los empleados?* ‘What did the boss tell the employees?’

   b. Prompt: ¡*Jóvenes, (subir) la mesa al segundo piso!*’

      ‘Young folks, (lift) the table to the second floor!’
c. Expected response: *suban* ‘lift’

4. Condition 4: Singular addressee in canonical imperative with clitic
   a. Preamble: *Felipe te dice: mi amigo se ha enojado conmigo y no sé qué hacer.*
   ‘Felipe tells you: my friend got mad at me and I don’t know what to do’
   ¿*Qué le sugieres?* ‘What do you suggest for him to do?’
   b. Prompt: ¡*Felipe, (llamar)!* ‘Felipe, (call)!’
   c. Expected response: *llámalo* ‘call him’

5. Condition 5: Singular addressee in negative imperative with clitic
   a. Preamble: *Marta te dice: mi amigo me ha pedido dinero de nuevo.*
   ‘Marta tells you: my friend has asked me for money again.’
   ¿*Qué le sugieres?* ‘What do you suggest for her to do?’
   b. Prompt: ¡*Marta, (no ayudar)!* ‘Marta, (not help)!’
   c. Expected response: *no lo ayudes* ‘do not help him’

As seen above, condition 2 is the negative version of condition 1 while condition 3 is the plural version of condition 1. Also, condition 4 is similar to condition 1 with the exception that it also elicits the use of a clitic. Finally, condition 5 is the negative version of condition 4. Regarding the structure of the task, the 36 experimental items were pseudo-randomized with 32 distractors in two blocks: the first block included conditions 1 through 3 and the second block included conditions 4 and 5. The conditions were divided in two blocks in order to prevent priming effects in the AJT: items in conditions 4 and 5 in the AJT present the target verb form as it examines clitic placement instead of verb morphology. In the EPT, on the other hand, participants were asked to produce both verb morphology and clitic in conditions 4 and 5. Also, the EPT was presented in two
different versions to prevent task and item effects. With regard to the responses from participants speaking varieties of Spanish that present differences with the verb paradigm displayed in this section (e.g., voseo, use of vosotros), the investigator did not discard those; instead, they were coded and analyzed attending to the features under examination (e.g., number, different verb paradigm, etc.). The verb paradigm shown above was selected as it is consistent with the varieties of Spanish (Mexican and Caribbean Spanish) that most heritage speakers and second language learners are familiar with in the context in which the data collection took place.

4.4.3.2. Acceptability Judgment Task

The second experimental task administered is an Acceptability Judgment Task (AJT). This task was administered in paper and pencil. The goal of this task is to shed light on what is the participants’ receptive grammatical knowledge of the structures under examination. The AJT look at the same conditions as the EPT (Singular addressee in canonical imperative, Singular addressee in negative imperative, Plural addressee in canonical imperative, Singular addressee in canonical imperative with clitic and Singular addressee in negative imperative with clitic) in both grammatical and ungrammatical contexts. In the AJT, the conditions were also divided into two blocks in order to prevent priming effects, as the items belonging to the conditions examining clitic position provided participants with the target verb form in order to help them focus on clitic position. Conditions looking at verb forms (conditions 1-6) were presented in the first block, while those conditions examining clitic position (conditions 7-10) were included in the second block. The first block had a total of 24 experimental items across 6 conditions ($k = 4$), whereas the second block had a total of 12 experimental items across 4 conditions.
In both blocks, half of the conditions included only grammatical tokens, while the other half were composed of only ungrammatical tokens. As in the EPT, 32 distractors looked at subject-verb inversion. The list below shows the 10 conditions tested in the AJT:

1. Grammatical singular addressee in canonical imperative: ¡Carlos, Toma!
2. Ungrammatical singular addressee in canonical imperative: *¡Carlos, tomes!
3. Grammatical singular addressee in negative imperative: ¡Carlos, no tomes!
4. Ungrammatical singular addressee in negative imperative: *¡Carlos, no toma!
5. Grammatical plural addressee in canonical imperative: ¡Jóvenes, tomen!
6. Ungrammatical plural addressee in canonical imperative: *¡Jóvenes, toma!
7. Grammatical singular addressee in canonical imperative with enclisis: ¡Felipe, déjalo!
8. Ungrammatical singular addressee in canonical imperative with proclisis:
   *
   ¡Felipe, lo deja!
9. Grammatical singular addressee in negative imperative with proclisis: ¡Felipe, no lo dejes!
10. Ungrammatical singular addressee in negative imperative with enclisis: *¡Felipe, no déjalo!

As in the EPT, participants were shown a preamble along with a picture; then, they were presented with a prompt, which included the test item under examination. The participants were asked to judge such prompt with the help of a Likert scale ranging from 1 to 5, as seen below. If the subjects judged the item as ‘1’ or ‘2’, they were asked to provide a reason.
Samples of Elicited Production Task items.

1. Condition 1: Grammatical singular addressee in canonical imperative
   a. Preamble: *La profesora vio que Marta no estaba prestando atención a la película.*
      ‘The teacher saw that Marta was not paying attention to the movie.’
      ¿Qué le dijo la profesora a Marta?
      ‘What did the teacher tell Marta?’
   b. Prompt: *¡Marta, mira la película!*
      ‘Marta, watch the movie!’
   c. Likert scale: 1 (*muy raro* ‘very odd’), 2 (*raro* ‘odd’), 3 (*ni bien ni mal* ‘neither good nor bad’), 4 (*bien* ‘good’), 5 (*completamente bien* ‘completely good’).
   d. Expected response: 4 or 5.

2. Condition 4: Ungrammatical singular addressee in negative imperative
   a. Preamble: *La mamá se enojó al ver a David volver de la piscina sin secarse.*
      ‘The mom got mad when she saw David come back from the swimming without having dried himself.’
      ¿Qué le dijo la mamá a David? ‘What did the mom tell David?’
   b. Prompt: *¡David, no moja el piso!* ‘David, do not soak the floor!’
   c. Likert scale: 1 (*muy raro* ‘very odd’), 2 (*raro* ‘odd’), 3 (*ni bien ni mal* ‘neither good nor bad’), 4 (*bien* ‘good’), 5 (*completamente bien* ‘completely good’).
   d. Expected response: 1 or 2.
3. Condition 10: Ungrammatical singular addressee in negative imperative with enclisis

   a. Preamble: Marta te dice: Fernando y yo tenemos algunos problemas, pero nos queremos. ¡No sé qué hacer!

      ‘Marta tells you: Fernando and I have some problems, but we love each other. I don’t know what to do!

      ¿Qué le sugieres? ‘What do you suggest for her to do?’

   b. Prompt: ¡Marta, no déjalo!

      ‘Marta, do not leave him!’

   c. Likert scale: 1 (muy raro ‘very odd’), 2 (raro ‘odd’), 3 (ni bien ni mal ‘neither good nor bad’), 4 (bien ‘good’), 5 (completamente bien ‘completely good’).

   d. Expected response: 1 or 2.

The 36 experimental items were pseudo-randomized with 32 distractors in two blocks: the first block included conditions 1 through 6 and the second block included conditions 7 through 10 in order to avoid priming effects. Also, the AJT was presented in two different versions to prevent task and item effects. The verb paradigm shown in the conditions and samples above was selected as it is consistent with the varieties of Spanish (Mexican and Caribbean Spanish) with which most heritage speakers and second language learners are familiar in the context in which the data collection took place.

**4.4.3.3. Lexical Frequency Self-Rating Task**

The Lexical Frequency Self-Rating Task (LFSRT) is an experimental task aiming to serve as an experimental tool to measure lexical frequency in the participants’ language experience and use, alternative to Davies’ (2018) *Corpus del español*. Okamoto
(2015) administered a similar task, in which native speakers of English were asked to choose among three options regarding the knowledge that they had of a lexical item and whether they used it rarely or often (i.e., “I know this word and often use it”, “I know this word but rarely use it”, or “I do not know this word”), and found a correlation between the participants’ responses and corpus word frequency. For this task, participants were asked to rate how frequently they are exposed to and they produce a certain lexical item; specifically, the lexical items used in the previous experimental tasks. Additionally, they were asked to provide a translation for the rated lexical items in order to guarantee that they are familiar with them. In order to avoid task effects, the participants completed this task in the last place. Participants rated the how frequent lexical item were by using a Likert scale ranging from 1 to 9, as seen below.

Samples of the Lexical Frequency Self-Rating Task

a. Component I: Exposure to lexical item in the input

Lexical item to rate: *mirar* ‘look at’ (Raw frequency count: 171,472)

Likert scale: 1 (Never), 2 (Hardly ever), 3 (A few times a year), 4 (Once a month), 5 (A few times a month), 6 (Once a week), 7 (Several times a week), 8 (Once a day), 9 (Several times a day).

b. Component II: Lexical item production

Lexical item to rate: *batir* ‘shake’ (Raw frequency count: 37,654)

Likert scale: 1 (Never), 2 (Hardly ever), 3 (A few times a year), 4 (Once a month), 5 (A few times a month), 6 (Once a week), 7 (Several times a week), 8 (Once a day), 9 (Several times a day).

c. Component III: Translation
Lexical item to translate: beber

Expected response: to drink.

The task contains three components: First, they rated how frequently they are exposed to the experimental tokens used in the previous tasks. Then, they rated how frequently they produce those experimental tokens, and, finally, they were asked to give a translation for those items. There were eight experimental tokens (and 22 distractors) in each component, which were the same lexical items used in the EPT and AJT (tomar, subir, mirar, parar, beber, batir, coser, and mojar) The task took around 10 minutes to complete.

The data obtained from the LFSRT allowed for a measure for lexical frequency alternative to corpora. Instead, this measure for lexical frequency is based on the participants’ intuitions. Table 7 below shows the participant-based lexical frequency for each lexical item next to their lexical frequency on Davies (2018).

Table 7. Frequency counts from the LFSRT compared to Davies’ (2018) Corpus del español for verbs in the first block of the EPT

<table>
<thead>
<tr>
<th>Lexical item</th>
<th>LFSRT Frequency Count</th>
<th>Davies’ (2018) Raw Frequency Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mirar ‘look at’</td>
<td>14.17</td>
<td>999,786 (tomar)</td>
</tr>
<tr>
<td>Tomar ‘take’, ‘drink’</td>
<td>13.77</td>
<td>260,987 (subir)</td>
</tr>
<tr>
<td>Parar ‘stop’</td>
<td>13.15</td>
<td>171,472 (mirar)</td>
</tr>
<tr>
<td>Beber ‘drink’</td>
<td>12.22</td>
<td>152,518 (parar)</td>
</tr>
<tr>
<td>Subir ‘lift’ ‘upload’</td>
<td>11.77</td>
<td>60,452 (beber)</td>
</tr>
<tr>
<td>Mojar ‘wet’, ‘soak’</td>
<td>10.28</td>
<td>37,654 (batir)</td>
</tr>
</tbody>
</table>
Table 7 above shows that lexical frequency count as measured by the LFSRT and the corpus does not match for any lexical item. However, both measures match in that all lexical items were relatively frequent except for three (mojar, batir, coser). Another main difference between the two measures is their ranges, being the LRSRT frequency count considerably narrower due to the 1-9 Likert scale used for data collection.

4.5. Data Analysis

Data from the Elicited Production Task were analyzed using generalized linear mixed-effects models with a binomial linking function. The models included response (expected answer, unexpected answer) as the dependent variable, and condition, proficiency, and Spanish use and exposure as fixed factors. Expected responses were coded as “1” and unexpected responses were coded as “0”. The models included random intercepts for each subject as well as for each lexical item. Significance of main effects and all possible interactions were assessed using hierarchical partitioning of the variance via nested model comparisons. Variables were dummy-coded and each dummy variable was compared with a reference variable by the model. We report p-values with alpha set at 0.05 and include confidence intervals of parameter estimates in order to provide an assessment of effect sizes.

Data from the Acceptability Judgment Task were analyzed using ordinal regression models. The models included response (1 through 5) as the dependent variable, and grammaticality (determined by the use of grammatical or ungrammatical verb forms in the AJT prompt), condition, proficiency, and Spanish use and exposure as
fixed factors. The models included random intercepts for each subject as well as for each lexical item. Significance of main effects and all possible interactions were assessed using hierarchical partitioning of the variance via nested model comparisons. Variables were dummy-coded and each dummy variable was compared with a reference variable by the model. We report p-values with alpha set at 0.05 and include confidence intervals of parameter estimates in order to provide an assessment of effect sizes.
Chapter 5:

Results

5.1. Introduction

This chapter presents and analyzes the data obtained from the tasks and questionnaires completed by the participants. The analysis will focus on the results from the Elicited Production Task (EPT; Section 4.4.3.1) and the Acceptability Judgment Task (AJT; Section 4.4.3.2), which aim to shed light on the three Research Questions introduced in Section 4.2.

This dissertation’s Research Questions inquire (i) whether the acquisition of Spanish imperatives follows a pattern of order of acquisition of syntax and morphology, (ii) whether this acquisition process is modulated by extra-linguistic factors (e.g., proficiency in Spanish, age of acquisition of Spanish and English, patterns of language use and exposure), and (iii) whether lexical frequency of the verb plays a role in the participants’ mental representation of Spanish.

5.2. Elicited Production Task (EPT)

In the EPT, participants were exposed to a scenario that elicited their production of a verb form in an imperative clause. By eliciting the participants’ productive knowledge of the syntax and morphology of imperatives in Spanish, the results provided by the EPT allow me to examine the participants’ knowledge of imperatives in Spanish in an online production task. Specifically, these results, combined with the data from the AJT, help us answer the question of whether the acquisition of the syntactic and morphological properties of Spanish imperatives follows a pattern of order of acquisition
Additionally, the role of extralinguistic factors can be explored by analyzing the results of the EPT and of the questionnaires (Research Question 2). Finally, the impact of lexical frequency in the within-subject results can be tested with the data from the EPT and lexical measures such as Davies’ (2018) corpus and the LFSRT (Section 4.4.2.3) (Research Question 3). In the following sections, I will present the variables in the EPT data, as well as descriptive statistics, statistical models and results from the EPT data.

5.2.1. Variables in the EPT data

The dependent variable in the EPT data is response, which was coded binomially according to whether the participant response was accurate or not (1 for accurate vs 0 for inaccurate responses). More than one possible response could have been considered accurate as social distance and dialectal variation are not variables under examination in this study; therefore, responses such as toma (tú), tome (usted), and tomá (vos) were all coded as accurate.

The independent variables in the EPT data are condition, group, Spanish proficiency, age of acquisition of Spanish/English, Spanish use and exposure, and lexical frequency. The first independent variable, condition, is subdivided in conditions distributed in two blocks. The first block, which examines verb morphology and syntax, tests three conditions: canonical imperative verb form in singular (e.g., toma), canonical imperative verb form in plural (e.g., tomen), and surrogate or suppletive verb form in singular in negative imperative clause (e.g., no tomes). The second block, which examines clitic production, test two conditions: clitic hosted in canonical imperative verb
form in singular (e.g., *mátaloo*), and clitic hosted in surrogate or suppletive verb form in singular in negative imperative clause (e.g., *no lo mates*).

On the other hand, four groups participated in the study: two experimental groups and two comparison groups. The two experimental groups were English-dominant English-Spanish bilinguals who differed in age of acquisition of Spanish: the heritage speakers (HSs) acquired Spanish since birth while the second language learners (L2s) acquired it later in life. The comparison groups, on the other hand, included a group of Spanish-dominant Spanish-English bilinguals (SDBs) and a group of Spanish instructors (SIs) with different dominant languages.

Spanish proficiency was measured with two different tests: the DELE and the MiNT. For data visualization purposes, this chapter presents plots featuring proficiency-based groups (i.e., low, intermediate and advanced proficiency groups). However, this dissertation uses a continuous variable for Spanish proficiency. Specifically, it uses MiNT scores as a proxy for Spanish proficiency as previous research has found a correlation between lexical knowledge and syntactic knowledge and overall proficiency (Bedore et al., 2012; Gollan et al., 2012; Sheng, et al., 2014, Treffers-Daller & Korybski, 2015). Given the difficulties that heritage speakers face in developing their writing skills in the heritage language (Colombi, 2000; Colombi & Roca, 2003; Parodi, 2008; Torres, 2016), a non-written test seemed a fairer measure to compare proficiencies across heritage and second language learners. Table 8 below shows a comparison of the participants’ DELE and Spanish MiNT scores across DELE-based proficiency levels and experimental group.
Table 8. Comparison of DELE and Spanish MiNT scores across groups and proficiency levels

<table>
<thead>
<tr>
<th></th>
<th>DELE</th>
<th>Spanish MiNT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>L2 learners</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beginner (n = 18)</td>
<td>$M = 24.8; SD = 2.37$</td>
<td>$M = 21.6; SD = 5.41$</td>
</tr>
<tr>
<td>Intermediate (n = 16)</td>
<td>$M = 32.9; SD = 2.64$</td>
<td>$M = 27.6; SD = 4.57$</td>
</tr>
<tr>
<td>Advanced (n = 17)</td>
<td>$M = 43.2; SD = 2.13$</td>
<td>$M = 39.6; SD = 13.1$</td>
</tr>
<tr>
<td><strong>Heritage speakers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beginner (n = 12)</td>
<td>$M = 26.4; SD = 2.06$</td>
<td>$M = 32.8; SD = 6.36$</td>
</tr>
<tr>
<td>Intermediate (n = 12)</td>
<td>$M = 36.7; SD = 2.29$</td>
<td>$M = 37; SD = 5.39$</td>
</tr>
<tr>
<td>Advanced (n = 34)</td>
<td>$M = 44.6; SD = 2.73$</td>
<td>$M = 52.8; SD = 7.17$</td>
</tr>
</tbody>
</table>

As seen in Table 8 above, Spanish MiNT scores seem to be correlated with DELE scores in both groups. Also, heritage speakers scored higher than L2 learners in both tests across all proficiency levels. This difference is more noticeable in MiNT scores, suggesting that written tasks might hinder the performance of heritage speakers and not be the most reliable proficiency measure to compare heritage speakers with second language learners.

Patterns of Spanish use and exposure is a continuous variable derived from the combination of data obtained from questions about Spanish use and exposure in the LEAP-Q and the LBQHS for the second language learners and the heritage learners, respectively. Specifically, in the LEAP-Q, it was extracted from the sum of the values that second language learners had selected from the 0-10 Likert scale inquiring about how frequently they used Spanish in different contexts (i.e., with friends, with family, watching TV, listening to radio or music, when reading, or in language-learning apps).
Therefore, values could range from 0 to 60, although in the data they actually ranged from 5 to 38. In the LBQHS, in turn, this variable was extracted from the sum of the values that heritage speakers had provided when asked to distribute their use of Spanish vs English in percentages across eight contexts (i.e., with parents, with siblings, with their partner, at work, at school, when reading, when watching TV, and at stores). Therefore, values could range from 0 to 800 in the unlikely scenario that they used only Spanish in all contexts. In the data, their values ranged from 40 to 550. The use of different ranges in the two groups (0-60 in the L2s vs 0-800 in the HSs) does not have consequences in the models because groups are not to be compared regarding this variable. Instead, this variable will be used only in within-group models.

Within the heritage speakers’ group, age of acquisition of Spanish was added as a continuous variable to determine whether it impacted their production of Spanish imperatives. Participants who reported having acquired English before the age of three were coded as simultaneous bilinguals while the remaining values in the variable where filled with the age in years at which sequential heritage speakers of Spanish reported having started to acquire English. Their ages of acquisition of English ranged from three to ten years old.

Finally, lexical frequency is a continuous variable featuring data extracted from the participants’ LFSRT. Specifically, in order to obtain these data, I added the values that the participants had selected for each of the two 1-9 Likert scales asking about how frequently they used and heard each of the eight key verbs that were used in the first block. Then, those results, who were unique to each participant, were averaged across all experimental participants. The values of this variable, which could range from 2 to 18,
ranged from 6.46 to 14.17 in the data (see Table 7; Section 4.4.2.3). Data from the LFSRT were preferred over Davies’ (2018) corpora as the lexical frequency intuitions of these bilingual populations may represent their input and output more appropriately than values based mostly on written texts produced by and for monolinguals. The variable lexical frequency is not to be included in any model examining the acquisition of clitics (i.e., second block of the EPT); instead, it is used to determine whether lexical frequency, as a proxy for frequency of activation, plays a role in the morphological instantiation of syntactic features in heritage speakers (Putnam & Sánchez, 2013).

In order to make the models more interpretable, several independent variables needed to be standardized. Specifically, MiNT scores, lexical frequency, patterns of Spanish use and exposure, for heritage speakers, age of onset of acquisition of English. Some of the plots that feature MiNT-based proficiency in any of their axes present the standardized version of the variable, in which 0 represents the group average and -1 and 1 represent the standard deviation.

5.2.2. Descriptive statistics

A total of 141 participants distributed in four main groups participated in the study (Section 4.3). Each participant completed 36 EPT test items distributed in two blocks: 24 for the first block, which examines the acquisition of verb morphosyntax, and 12 for the second block, which looks at the acquisition of clitic production and placement in imperative clauses. Figure 13 below shows the proportion of accurate EPT responses given by the second language learners and the Spanish instructors across conditions and proficiency-based levels.
In the verb morphology block, the second language learners’ accuracy seems to increase as a function of their proficiency level across conditions. The increase is not pronounced in the singular verb morphology condition ($M = 0.87; SD = 0.34$ for beginners vs $M = 0.91; SD = 0.28$ for the intermediate vs $M = 0.96; SD = 0.19$ for the advanced), but it is dramatic in the surrogate verb morphology condition ($M = 0.34; SD = 0.47$ for beginners vs $M = 0.34; SD = 0.48$ for the intermediate vs $M = 0.67; SD = 0.47$ for the advanced), and in the plural verb morphology condition ($M = 0.09; SD = 0.29$ for beginners vs $M = 0.27; SD = 0.44$ for the intermediate vs $M = 0.54; SD = 0.5$ for the advanced). On the other hand, the instructors, whose proficiency was always advanced as determined by their DELE scores, performed at ceiling in all three conditions ($M = 1; SD = 0$ for the singular verb morphology condition vs $M = 0.98; SD = 0.11$ for the surrogate
verb morphology condition vs $M = 0.95; SD = 0.2$ for the plural verb morphology condition).

The responses in the clitic placement block follow a similar pattern as the second language learners’ accuracy also seems to increase as a function of their proficiency levels. This can be observed in the accuracy in clitic placement in both affirmative ($M = 0.18; SD = 0.39$ for beginners vs $M = 0.35; SD = 0.48$ for the intermediate vs $M = 0.73; SD = 0.44$ for the advanced) and negative imperatives ($M = 0.03; SD = 0.16$ for beginners vs $M = 0.18; SD = 0.38$ for the intermediate vs $M = 0.59; SD = 0.49$ for the advanced). As in the first block, the Spanish instructors also performed at ceiling in these conditions ($M = 1; SD = 0$ for clitic placement in affirmative imperatives vs $M = 1; SD = 0$ for clitic placement in negative imperatives).

Figure 14, in turn, shows the proportion of accurate responses that the heritage speakers and the Spanish-dominant bilinguals provided in the EPT across conditions and proficiency levels.
Similar to the second language learners, the heritage speakers’ response accuracy also seems to increase as a function of their proficiency level across conditions in both blocks. In the verb morphology block, as in the second language learners, this increase is not substantial in the singular verb morphology condition ($M = 0.91; SD = 0.29$ for beginners vs $M = 0.94; SD = 0.24$ for the intermediate vs $M = 0.98; SD = 0.12$ for the advanced), but it is sizeable in the plural verb morphology condition ($M = 0.12; SD = 0.32$ for beginners vs $M = 0.21; SD = 0.41$ for the intermediate vs $M = 0.79; SD = 0.41$ for the advanced). In the surrogate verb morphology condition, on the other hand, such increase is not clear between the beginner and intermediate groups, but it occurs overall when looking also at the advanced participants ($M = 0.31; SD = 0.47$ for beginners vs $M = 0.27; SD = 0.47$ for the intermediate vs $M = 0.83; SD = 0.38$ for the advanced). The Spanish-dominant bilinguals, on the other hand, performed at ceiling in the three
conditions \((M = 1; SD = 0)\) for the singular verb morphology condition vs \(M = 1; SD = 0\) for the surrogate verb morphology condition vs \(M = 1; SD = 0\) for the plural verb morphology condition).

In the clitic placement block, the heritage speakers’ responses also seem to be modulated by their proficiency level. Between conditions, clitic placement was less challenging in affirmative \((M = 0.63; SD = 0.49)\) for beginners vs \(M = 0.79; SD = 0.41\) for the intermediate vs \(M = 0.92; SD = 0.28\) for the advanced) than in negative imperatives \((M = 0.17; SD = 0.38)\) for beginners vs \(M = 0.61; SD = 0.49\) for the intermediate vs \(M = 0.88; SD = 0.33\) for the advanced), especially among beginner and intermediate heritage speakers. Their results can be comparable with the second language learners’ in that, in both groups, accuracy increases as a function of proficiency level and in that clitic placement in affirmative imperatives seems to be less difficult than in negative imperatives. However, heritage speakers, outperform second language learners, as they produced more accurate responses across conditions and proficiency levels. With regard to the Spanish-dominant bilinguals, their responses were also mostly accurate \((M = 0.87; SD = 0.34)\) for clitic placement in affirmative imperatives vs \(M = 0.92; SD = 0.27\) for clitic placement in negative imperatives). It should be noted that all the responses produced by Spanish-dominant bilinguals that were coded as inaccurate were not ungrammatical; instead, they produced a determiner + noun determiner phrase instead of the clitic that was expected in the EPT (e.g., \(no\ busques\ a\ tu\ amigo\ \textquoteleft\textquoteleft do\ not\ look\ for\ your\ friend\textquoteright\ vs \(no\ lo\ busques\ \textquoteleft\textquoteleft do\ not\ look\ for\ him\textquoteright\)).

The data presented above tackles the acquisition of the morphological and syntactic properties of Spanish imperatives across proficiency groups differing in age of
onset of acquisition of Spanish, two of the variables investigated by this dissertation’s Research Question 2. Research Question 3, in turn, examines lexical frequency, a within-subject variable that may account for within-subject variability in heritage speakers and second language learners. As stated above, the data used to represent lexical frequency was obtained via a LFSRT instead of from a corpus. (see Table 7; Section 4.4.2.3). Figure 15 below shows the proportion of accurate EPT responses given by second language learners across the eight lexical items tested in three different proficiency levels.

The eight lexical items on which the participants were tested presented various lexical frequency counts, as measured by the LFSRT. Also, these lexical items belonged to the three different verbal inflectional classes in Spanish, featuring the three theme vowels in Spanish verbal inflections. The data presented in Figure 15 suggests that lexical frequency might not account for within-subject variability in L2 learners. This
observation will be tested in the statistical models in the following section. Table 9 below presents detailed information on the proficiency-based group responses for each lexical item.

Table 9. Proportion of accurate EPT responses across lexical items and proficiency levels in L2 learners

<table>
<thead>
<tr>
<th>Lexical Item</th>
<th>Beginner</th>
<th>Intermediate</th>
<th>Advanced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mirar ‘look at’</td>
<td>$M = 0.46; SD = 0.50$</td>
<td>$M = 0.52; SD = 0.50$</td>
<td>$M = 0.75; SD = 0.44$</td>
</tr>
<tr>
<td>Tomar ‘take’, ‘drink’</td>
<td>$M = 0.48; SD = 0.50$</td>
<td>$M = 0.54; SD = 0.50$</td>
<td>$M = 0.80; SD = 0.40$</td>
</tr>
<tr>
<td>Parar ‘stop’</td>
<td>$M = 0.43; SD = 0.50$</td>
<td>$M = 0.60; SD = 0.49$</td>
<td>$M = 0.78; SD = 0.42$</td>
</tr>
<tr>
<td>Beber ‘drink’</td>
<td>$M = 0.46; SD = 0.50$</td>
<td>$M = 0.48; SD = 0.51$</td>
<td>$M = 0.71; SD = 0.46$</td>
</tr>
<tr>
<td>Subir ‘lift’ ‘upload’</td>
<td>$M = 0.33; SD = 0.48$</td>
<td>$M = 0.42; SD = 0.50$</td>
<td>$M = 0.71; SD = 0.46$</td>
</tr>
<tr>
<td>Mojar ‘wet’, ‘soak’</td>
<td>$M = 0.44; SD = 0.50$</td>
<td>$M = 0.48; SD = 0.51$</td>
<td>$M = 0.73; SD = 0.45$</td>
</tr>
<tr>
<td>Batir ‘shake’</td>
<td>$M = 0.41; SD = 0.50$</td>
<td>$M = 0.54; SD = 0.50$</td>
<td>$M = 0.65; SD = 0.48$</td>
</tr>
<tr>
<td>Coser ‘sew’</td>
<td>$M = 0.46; SD = 0.50$</td>
<td>$M = 0.5; SD = 0.51$</td>
<td>$M = 0.69; SD = 0.47$</td>
</tr>
</tbody>
</table>

Instead of lexical frequency, inflectional morphology might be a factor for within-subject variability in L2 learners. Specifically, it seems that L2 learners have difficulties with verbs belonging to the second macroclass (i.e., presenting verbal theme vowels $e$ or $i$) as opposed to the first macroclass (i.e., presenting verbal theme vowels $a$), the two main categories in which Spanish verbal inflectional morphology is subdivided (Section 3.5) (Aguirre & Dressler, 2006; Bermúdez-Otero, 2013; Oltra-Massuet & Arregi, 2005). The difference in accuracy in the production of verb morphology between the two verbal inflectional macroclasses is also found in heritage speakers. Figure 16 shows the
The proportion of accurate EPT responses given by second language learners across the eight lexical items tested in three different proficiency levels.

In contrast with the L2 learners, the responses of the heritage speakers seem to be modulated by lexical frequency. This claim will be tested in the statistical models presented in the next section. Nevertheless, the heritage speakers present similarities with the L2 learners in that the second macroclass of verbal inflection seems to be a challenge. This occurs in all proficiency-based groups, even among the advanced heritage speakers. Table 10 below presents the mean accuracy rates across lexical item and proficiency-based group.
Table 10. Proportion of accurate EPT responses across lexical items and proficiency levels in heritage speakers

<table>
<thead>
<tr>
<th>Lexical Item</th>
<th>Beginner</th>
<th>Intermediate</th>
<th>Advanced</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mirar</strong> 'look at'</td>
<td>$M = 0.67; SD = 0.48$</td>
<td>$M = 0.47; SD = 0.51$</td>
<td>$M = 0.91; SD = 0.29$</td>
</tr>
<tr>
<td><strong>Tomar</strong> 'take’, ‘drink’</td>
<td>$M = 0.56; SD = 0.50$</td>
<td>$M = 0.61; SD = 0.49$</td>
<td>$M = 0.95; SD = 0.22$</td>
</tr>
<tr>
<td><strong>Parar</strong> ‘stop’</td>
<td>$M = 0.56; SD = 0.50$</td>
<td>$M = 0.67; SD = 0.48$</td>
<td>$M = 0.94; SD = 0.24$</td>
</tr>
<tr>
<td><strong>Beber</strong> ‘drink’</td>
<td>$M = 0.28; SD = 0.45$</td>
<td>$M = 0.36; SD = 0.49$</td>
<td>$M = 0.80; SD = 0.40$</td>
</tr>
<tr>
<td><strong>Subir</strong> ‘lift’ ‘upload’</td>
<td>$M = 0.33; SD = 0.48$</td>
<td>$M = 0.42; SD = 0.50$</td>
<td>$M = 0.84; SD = 0.37$</td>
</tr>
<tr>
<td><strong>Mojar</strong> ‘wet’, ‘soak’</td>
<td>$M = 0.53; SD = 0.51$</td>
<td>$M = 0.47; SD = 0.51$</td>
<td>$M = 0.94; SD = 0.24$</td>
</tr>
<tr>
<td><strong>Batir</strong> ‘shake’</td>
<td>$M = 0.31; SD = 0.47$</td>
<td>$M = 0.33; SD = 0.48$</td>
<td>$M = 0.75; SD = 0.44$</td>
</tr>
<tr>
<td><strong>Coser</strong> ‘sew’</td>
<td>$M = 0.33; SD = 0.48$</td>
<td>$M = 0.44; SD = 0.50$</td>
<td>$M = 0.81; SD = 0.39$</td>
</tr>
</tbody>
</table>

Another indicator that lexical frequency might be a factor in the production of verb morphology in heritage speakers but not in L2 learners is the difference in variability between the two groups. Specifically, the variability in accuracy for each lexical item is wider in heritage speakers than in L2 speakers in all proficiency-based groups. This phenomenon occurs in participants featuring beginner ($M = 0.28; SD = 0.45$ for *beber* vs $M = 0.67; SD = 0.48$ for *mirar* in heritage speakers vs $M = 0.33; SD = 0.48$ for *subir* vs $M = 0.48; SD = 0.50$ for *tomar* in L2 learners), intermediate ($M = 0.33; SD = 0.48$ for *batir* vs $M = 0.67; SD = 0.48$ for *parar* in heritage speakers vs $M = 0.42; SD = 0.50$ for *subir* vs $M = 0.60; SD = 0.49$ for *parar* in L2 learners), and advanced proficiency
\( M = 0.75; SD = 0.44 \) for batir vs \( M = 0.95; SD = 0.22 \) for tomar in heritage speakers vs \( M = 0.65; SD = 0.48 \) for batir vs \( M = 0.80; SD = 0.40 \) for tomar in L2 learners).

In conclusion, the descriptive statistics introduced in this section suggest that some independent variables under examination (e.g., proficiency in both groups, lexical frequency in the heritage speakers) may have an impact on the acquisition of the morphological and syntactic properties of imperatives in Spanish. This section has presented potential effects stemming from differences in proficiency-based groups, age of onset of acquisition of English, and lexical frequency. These effects will be tested in the statistical models featured below, which will also address independent variables that were not discussed in this section: age of onset of acquisition of English among heritage speakers and patterns of Spanish use and exposure (Section 4.3.1).

5.2.3. Statistical models

This section presents the statistical models run in order to analyze the EPT data. The EPT data were analyzed using eight generalized linear mixed-effects models with a binomial linking function. The EPT data from second language learners was analyzed using three models, looking at each of the EPT blocks and across conditions. The EPT data from heritage speakers was analyzed following the same pattern. Finally, two more models analyzed group differences between second language learners and heritage speakers in the two blocks of the EPT data.

5.2.3.1. Second language learners

The first model examined the acquisition of verb morphology in the second language learners as measured by their EPT data. The model included \textit{response} as dependent variable, and condition (singular verb morphology, plural verb morphology,
and surrogate verb morphology), proficiency as measured by their Spanish MiNT scores, lexical frequency and patterns of Spanish use and exposure as independent variables. The model examined interactions between condition and proficiency and included random intercepts for each subject as well as for each lexical item.

The model found differences across conditions. In comparison with the responses to the test items testing the surrogate verb morphology condition, the model found that second language learners responded more accurately in the singular verb morphology condition ($\beta = 1.88$, SE = 0.83, z = 2.25, $p = 0.02$) while their responses were less accurate in the plural verb morphology condition ($\beta = -1.74$, SE = 0.66, z = -2.62, $p < 0.01$). Figure 17 shows the correlations between accuracy across conditions examining verb morphology and proficiency as measured by the Spanish MiNT. Recall that the axis featuring MiNT-based proficiency is based on a standardized variable in which 0 represents the group average and -1 and 1 represent the standard deviation.
This first model also found a main effect of proficiency as measured by the second language learners’ Spanish MiNT scores ($\beta = 3.90, SE = 0.92, z = 4.23, p < 0.01$), consistently with the observations made in the descriptive statistics section. The model also revealed an interaction between the singular verb morphology condition and MiNT-based proficiency ($\beta = -2.24, SE = 1.05, z = -2.13, p = 0.03$). No other effects or interactions were found. The effects of the remaining dependent variables, lexical frequency ($\beta = 0.19, SE = 0.14, z = 1.35, p = 0.17$) and patterns of Spanish use and exposure ($\beta = 0.03, SE = 0.22, z = 0.14, p = 0.88$), were not significant.

On the other hand, the second model examined the EPT data in order to investigate the acquisition of clitic placement in the second language learners. Like the first model, this model included response as dependent variable, and condition (affirmative or negative imperative), proficiency as measured by their Spanish MiNT
scores and patterns of Spanish use and exposure as independent variables. Unlike the first model, this model did not examine lexical frequency. This second model examined interactions between condition and proficiency and included random intercepts for each subject as well as for each lexical item.

The second model also revealed differences across conditions. Accurate responses differed between affirmative and negative imperatives. Specifically, the participants’ responses were more accurate in affirmative contexts ($\beta = 1.08$, SE = 0.43, $z = 2.48$, $p = 0.01$). Figure 18 shows the correlations between accuracy across conditions examining clitic placement and proficiency as measured by the Spanish MiNT.

Figure 18: Correlations between EPT accuracy in clitic placement and proficiency in L2 learners

![Figure 18](image)

This second model also revealed a main effect of proficiency as measured by the second language learners’ Spanish MiNT scores ($\beta = 3.72$, SE = 0.67, $z = 5.48$, $p < 0.01$). This finding is consistent with the results provided by the first model as well as with the
descriptive statistics presented in the section above. This model did not find any other
effect or interaction: the effect of the independent variable patterns of Spanish use and
exposure was not significant ($\beta = -0.30, SE = 0.48, z = -0.62, p = 0.53$) while, as stated
above, lexical frequency was not included in this model.

Finally, the third model investigates the order of acquisition of the five conditions
under examination. As the models above, it included response as dependent variable, but
only condition and proficiency as independent variables. It also included random
intercepts for each participant and lexical item.

The third model showed that the second language learners’ responses did not
differ between those responses given to the items in the clitic in affirmative imperative
condition and two other conditions: the surrogate verb morphology condition ($\beta = 0.57,$
$SE = 0.78, z = 0.73, p = 0.46$) and the plural verb morphology condition ($\beta = 1.10, SE =
0.80, z = -1.37, p = 0.17$). Figure 19 shows the correlations between all five conditions
tested and proficiency in second language learners.
The similar responses in these three conditions might suggest that participants acquire the properties tested in these conditions at the same pace. Specifically, these three conditions are acquired at the advanced proficiency level given the data shown in Figure 13. On the other hand, participants provided more target-like responses in the singular verb morphology condition ($\beta = 4.97$, SE = 0.71, $z = 7.02$, $p < 0.01$), which indicates that this condition is acquired earlier across proficiency, but fewer target-like responses in the clitic in negative imperative condition ($\beta = -1.84$, SE = 0.66, $z = -2.76$, $p < 0.01$), which indicates that the properties tested in this condition may be the last to be acquired by second language learners. As in previous models, proficiency was found to be a predictor of the participants’ responses ($\beta = 2.75$, SE = 0.34, $z = 8.03$, $p < 0.01$).
5.2.3.2. Heritage speakers

The fourth and fifth models analyze the heritage speakers’ EPT data: the fourth model examines the EPT data regarding the conditions on verb morphology while the fifth model focuses on the EPT data on clitic placement. Specifically, the fourth model included \textit{response} as dependent variable, and condition (singular verb morphology, plural verb morphology, and surrogate verb morphology), proficiency as measured by their Spanish MiNT scores, lexical frequency, and age of onset of acquisition of English as independent variables. Like the first model, which examined the acquisition of verb morphology in second language learners, the fourth model looked at interactions between condition and proficiency and included random intercepts for each subject as well as for each lexical item. Apart from the different populations, the only difference between the first and the fourth was that the fourth model included age of onset of acquisition of English as an independent variable.

The fourth model yielded similar results to the first one. It found differences across conditions: it revealed that heritage speakers were more accurate in the singular verb morphology condition than in the surrogate verb morphology condition ($\beta = 3.92$, $SE = 0.80$, $z = 4.84$, $p < 0.01$) and more accurate in the surrogate verb morphology condition than in the plural verb morphology condition ($\beta = -0.61$, $SE = 0.28$, $z = -2.14$, $p = 0.03$). Figure 20 shows the correlations between accuracy in the heritage speakers’ EPT responses across conditions examining verb morphology and proficiency as measured by the Spanish MiNT.
The fourth model also found a main effect of proficiency as measured by the heritage speakers’ Spanish MiNT scores ($\beta = 2.37, SE = 0.49, z = 4.76, p < 0.01$), consistently with the models presented above. Unlike the first model, which did not find a main effect of lexical frequency, this model did reveal that lexical frequency is a significant predictor for the heritage speakers’ EPT responses ($\beta = 0.92, SE = 0.35, z = 2.59, p < 0.01$). Figure 21 below shows the correlation between lexical frequency and accuracy in verb morphology in average and across conditions in heritage speakers.
The model also revealed two interactions: one between the singular verb morphology condition and MiNT-based proficiency ($\beta = -1.56$, $SE = 0.61$, $z = -2.54$, $p = 0.01$) and a second interaction between the plural verb morphology condition and MiNT-based proficiency ($\beta = 0.98$, $SE = 0.43$, $z = 2.26$, $p = 0.02$). No other effects or interactions were found: Both patterns of Spanish use and exposure ($\beta = 0.09$, $SE = 0.41$, $z = 0.23$, $p = 0.81$) and age of onset of acquisition of English ($\beta = 0.64$, $SE = 0.44$, $z = 1.44$, $p = 0.14$) were not found to be significant predictors.

Unlike the second model, which looked at the acquisition clitic placement in second language learners, the fifth model, which investigated the same phenomenon in heritage speakers, did not find differences across conditions ($\beta = 0.87$, $SE = 0.50$, $z = 1.76$, $p = 0.08$). In other words, heritage speakers produced and placed clitics as expected similarly in both affirmative and negative imperatives. Proficiency, on the other hand, was revealed to be a significant predictor ($\beta = 3.38$, $SE = 0.91$, $z = 3.69$, $p < 0.01$), like in all models presented previously in this section. Figure 22 presents correlations between accuracy in the EPT data and proficiency.
The fifth model did not reveal any other significant independent variable or interaction. Specifically, neither patterns of Spanish use and exposure ($\beta = 0.55$, $SE = 0.75$, $z = 0.07$, $p = 0.94$) or age of onset of acquisition of English ($\beta = -0.44$, $SE = 0.75$, $z = -0.58$, $p = 0.55$) were found to be significant. These findings are consistent with those yielded by the fourth model, which did not find patterns of Spanish use and exposure or age of onset of acquisition of English to be significant predictors in the heritage speakers’ responses.

Finally, the eighth model examines the order of acquisition of the five conditions tested in this study. As the third model above, this model included response as dependent variable and condition and proficiency as independent variables, as well as random intercepts for each participant and lexical item.
The eighth model found that the accuracy in the heritage speakers’ responses was determined by the condition that they were being tested. It revealed that their responses to test items in the singular verb morphology condition were the most target-like, followed by the test items in the clitic in affirmative imperative condition (β = 2.41, SE = 0.55, z = 4.32, p > 0.01), which was the condition used as a reference in the model. Figure 23 shows the correlations between the five conditions tested and proficiency in heritage speakers.

On the other hand, in comparison with the responses to the clitic in affirmative imperative condition, the heritage speakers gave fewer target-like responses in three conditions. In descending order according to their target-like responses, those conditions were: the clitic in negative imperative condition (β = -1.55, SE = 0.25, z = -6.16, p > 0.01), the surrogate verb morphology condition (β = -2.14, SE = 0.51, z = -4.23, p >
0.01), and the plural verb morphology condition (\(\beta = -2.85, \text{SE} = 0.51, z = -5.56, p > 0.01\)). Unlike the second language learners, whose production indicates that only advanced learners acquire certain properties, the results yielded by the eighth model suggest that heritage speakers acquire the properties under examination across proficiency stages instead of at a specific proficiency level.

**5.2.3.3. The role of age of onset of acquisition of Spanish in the production data**

The seventh and eighth models focused on differences between groups, namely second language learners and heritage speakers, in order to determine whether age of onset of acquisition of Spanish plays a role in their acquisition of the morphological and syntactic properties of imperatives in Spanish. Both models included *response* as dependent variable, and condition and group as independent variables. The seventh model, which looked at the responses regarding verb morphology, found differences between groups (\(\beta = -1.04, \text{SE} = 0.46, z = -2.21, p = 0.02\)) and across conditions: between singular and surrogate verb morphology conditions (\(\beta = -1.16, \text{SE} = 0.24, z = -4.78, p < 0.01\)) and between plural and surrogate verb morphology conditions (\(\beta = 3.25, \text{SE} = 0.44, z = 7.33, p < 0.01\)). Similar results were found by the eighth model, which analyzed data on clitic placement. The model revealed differences between conditions (\(\beta = 1.22, \text{SE} = 0.24, z = 5.06, p < 0.01\)), as in the second and fifth models above, and between groups (\(\beta = -6.57, \text{SE} = 1.27, z = -5.17, p < 0.01\)).

To sum, the eight models presented above have revealed that condition and Spanish proficiency modulate the second language and heritage speakers’ responses, as these independent variables were found to be significant predictors in all models. Lexical frequency, in turn, was only a determining factor for heritage speakers while patterns of
Spanish use and exposure was not significant in any model. Finally, the models found age of onset of acquisition of Spanish (i.e., second language learners vs heritage speakers) to be a significant predictor, unlike age of onset of acquisition of English among heritage speakers. The following section examines these variables in a comprehension task.

5.3. Acceptability Judgment Task (AJT)

The AJT examined the participants’ receptive grammatical knowledge by asking them to judge the grammaticality of a sentence. Participants were shown a series of grammatical and ungrammatical sentences and were prompted to rate them using a 1-5 Likert scale (Section 4.4.3.2). The results yielded by the AJT, in combination with the EPT data, help answer this study’s Research Questions. By looking at how proficiency modulates their grammaticality judgments across conditions, the results inform us on how to answer Research Question 1. Research Question 2, which examines the impact of extralinguistic factors on the acquisition of imperatives in Spanish, can be tackled by combining the results of the AJT and EPT data with the participants’ language background information gathered by the questionnaires. Finally, the combination of the AJT and EPT data with lexical frequency as measured with the LFSRT (Section 4.4.2.3) (Research Question 3) can inform us on the effects of lexical frequency in the acquisition of the verb morphology used in imperatives. The sections below present the variables in the AJT data as well as descriptive statistics and statistical models derived from the AJT data.

5.3.1. Variables in the AJT data

In order to guarantee that the data from the EPT and the AJT were comparable, the variables considered for both tasks were almost identical. Both EPT and AJT share
several variables: response as independent variable, and condition, group, Spanish proficiency, age of acquisition of Spanish/English, Spanish use and exposure, and lexical frequency as dependent variables. However, the two data sets present two differences. First, the independent variable is not binomial but multinomial as participants chose their ratings using a 1-5 Likert scale; therefore, their responses were 1 very odd, 2 odd, 3 neither good or bad, 4 good, 5 very good instead of 1 for accurate response or 0 for inaccurate response. Second, the AJT data presents a dependent variable that is not featured in the EPT data: grammaticality, which refers to whether the test items that participants were asked to rate were grammatical or ungrammatical. As seen in section 4.4.3.2, half of the test items in each condition were grammatical while the other half were ungrammatical. All other variables were identical to the ones introduced for the EPT data (Section 5.2.1).

5.3.2. Descriptive statistics

The same 141 participants that completed the EPT completed also the AJT (Section 4.3). Each participant completed 36 EPT test items distributed in two blocks: 24 for the first block, which examines the acquisition of verb morphosyntax, and 12 for the second block, which looks at the acquisition of clitic production and placement in imperative clauses. Figure 24 shows the acceptability of verb morphology in imperatives as a function of grammaticality (grammatical or ungrammatical), condition and proficiency levels in L2 learners and, as a comparison group, in instructors.
The second language learners’ receptive grammatical knowledge seems to increase as a function of their proficiency across conditions. This is observed as their judgments for grammatical test items increase and for ungrammatical test items decrease across their proficiency levels. When looking at each condition, it seems that beginners may have a more target-like receptive grammatical knowledge in the singular verb morphology condition ($M = 4.17; SD = 1.19$ for grammatical items vs $M = 2.74; SD = 1.37$ for ungrammatical items) and in the plural verb morphology condition ($M = 3.98; SD = 1.12$ for grammatical items vs $M = 2.89; SD = 1.52$ for ungrammatical items) than in the surrogate verb morphology condition ($M = 3.60; SD = 1.42$ for grammatical items vs $M = 3.31; SD = 1.45$ for ungrammatical items). In the intermediate group, this difference is still observable. Like their beginner counterparts, intermediate second language learners still have a more target-like receptive grammatical knowledge in the singular verb morphology condition ($M = 4.38; SD = 0.97$ for grammatical items vs $M = 3.08; SD = 1.33$ for ungrammatical items) and in the plural verb morphology condition ($M = 4.08; SD = 1.22$ for grammatical items vs $M = 2.88; SD = 1.20$ for ungrammatical
items) than in the surrogate verb morphology condition ($M = 4.19; SD = 1.05$ for grammatical items vs $M = 3.62; SD = 1.46$ for ungrammatical items). Finally, those between-condition differences seem to dissipate in the advance second language learners as their responses seem to be guided by the grammaticality of the items in all conditions: in the singular verb morphology condition ($M = 4.15; SD = 1.28$ for grammatical items vs $M = 2.38; SD = 1.53$ for ungrammatical items), in the plural verb morphology condition ($M = 3.90; SD = 1.42$ for grammatical items vs $M = 1.54; SD = 0.74$ for ungrammatical items), and in the surrogate verb morphology condition ($M = 4.18; SD = 1.20$ for grammatical items vs $M = 2.19; SD = 1.43$ for ungrammatical items). The instructors’ responses, in turn, seem to be very sensitive to the grammaticality of the test items across conditions: in the singular verb morphology condition ($M = 4.75; SD = 0.80$ for grammatical items vs $M = 1.08; SD = 0.47$ for ungrammatical items), in the plural verb morphology condition ($M = 4.70; SD = 0.83$ for grammatical items vs $M = 1.23; SD = 0.74$ for ungrammatical items), and in the surrogate verb morphology condition ($M = 4.69; SD = 0.94$ for grammatical items vs $M = 1.32; SD = 0.99$ for ungrammatical items). These results suggest that proficiency plays a role in their acquisition of verb morphology in imperatives and that surrogate verb morphology may be more challenging to develop in second language learners.

Similarly, the second language responses to the conditions examining the acquisition of clitic placement in imperatives seem to be more target-like as their proficiency increases. This correlation occurs across conditions. However, it is observed mostly in the rejection of ungrammatical test items, as grammatical test items are overwhelmingly accepted across proficiency levels. Figure 25 shows the second language
learners’ acceptability of clitic placement in imperatives as a function of grammaticality, condition, and proficiency in comparison with the instructors’ performance.

Figure 25 above shows how more proficient participants reject ungrammatical test items more than their less proficient counterparts. Participants in the beginner group do not seem to be sensitive to grammaticality in either the affirmative ($M = 4.35; SD = 0.93$ for grammatical items vs $M = 3.89; SD = 1.14$ for ungrammatical items) or the negative ($M = 3.76; SD = 1.24$ for grammatical items vs $M = 3.35; SD = 1.42$ for ungrammatical items) conditions. Sensitivity to grammaticality in these conditions does not seem to develop in intermediate second language learners, as their judgments are similar across grammaticality in the affirmative ($M = 4.13; SD = 1.20$ for grammatical items vs $M = 4.03; SD = 1.20$ for ungrammatical items) and in the negative ($M = 4.41; SD = 0.81$ for grammatical items vs $M = 3.74; SD = 1.41$ for ungrammatical items) conditions. Finally, advanced second language learners do seem to be sensitive to grammaticality. Their responses seem to be guided by the grammaticality of the test items in the affirmative ($M = 4.35; SD = 1.09$ for grammatical items vs $M = 2.18; SD = 1.56$ for ungrammatical
items) and in the negative ($M = 4.41; SD = 1.02$ for grammatical items vs $M = 2.02; SD = 1.53$ for ungrammatical items) conditions. As expected, the instructors’ responses show that they are sensitive to grammaticality in the affirmative ($M = 4.90; SD = 0.54$ for grammatical items vs $M = 1.13; SD = 0.72$ for ungrammatical items) and in the negative ($M = 4.92; SD = 0.53$ for grammatical items vs $M = 1.25; SD = 0.89$ for ungrammatical items) conditions. To sum, these results indicate that proficiency is a factor in the acquisition of clitic placement in imperatives; this can be noticed in the development of rejection of ungrammatical test items across proficiency levels.

The results yielded by the heritage speakers’ AJT data also highlight the important role of proficiency in the acquisition of the morphological and syntactic properties of the imperatives in Spanish. This correlation between proficiency receptive grammatical knowledge in heritage speakers occurs in both verb morphology and clitic placement. With regard to verb morphology, Figure 26 below shows the acceptability of verb morphology in imperatives in heritage speakers and Spanish-dominant bilinguals.

Figure 26 presents the data across grammaticality, condition and proficiency.
Like the second language learners, the heritage speakers’ grammatical knowledge develops as their proficiency increases. This can be noticed in all three conditions, although it may be more visible in the singular verb morphology condition, as both beginner and intermediate heritage speakers show a broader difference between their acceptances and rejections in that condition. With regard to each proficiency level, beginners may have developed sensitivity to grammaticality in the singular verb morphology condition \( (M = 4.17; SD = 0.86 \text{ for grammatical items vs } M = 3.17; SD = 1.31 \text{ for ungrammatical items}) \), but such development is not as clear in the plural verb morphology condition \( (M = 3.85; SD = 1.27 \text{ for grammatical items vs } M = 3.52; SD = 1.25 \text{ for ungrammatical items}) \) or in the surrogate verb morphology condition \( (M = 3.83; SD = 1.17 \text{ for grammatical items vs } M = 3.88; SD = 1.06 \text{ for ungrammatical items}) \).

Intermediate heritage speakers show signs for the development of their receptive grammatical knowledge, particularly in the singular verb morphology condition \( (M = 4.38; SD = 0.86 \text{ for grammatical items vs } M = 2.50; SD = 1.32 \text{ for ungrammatical items}) \). However, they do not rate grammatical and ungrammatical test items very differently in the other two conditions: in the plural verb morphology condition \( (M = 3.96; SD = 1.25 \text{ for grammatical items vs } M = 3.35; SD = 1.33 \text{ for ungrammatical items}) \) or in the surrogate verb morphology condition \( (M = 3.67; SD = 1.42 \text{ for grammatical items vs } M = 3.17; SD = 1.45 \text{ for ungrammatical items}) \). Advanced heritage speakers, on the other hand, do show sensitivity to grammaticality in all the conditions: in the singular verb morphology condition \( (M = 4.75; SD = 0.61 \text{ for grammatical items vs } M = 1.78; SD = 1.08 \text{ for ungrammatical items}) \), in the plural verb morphology condition \( (M = 4.61; SD = 0.86 \text{ for grammatical items vs } M = 2.16; SD = 1.42 \text{ for ungrammatical items}) \), and in the
surrogate verb morphology condition ($M = 4.71; SD = 0.63$ for grammatical items vs $M = 2.06; SD = 1.35$ for ungrammatical items). Finally, the Spanish-dominant bilinguals’ responses, like those provided by the advanced heritage speakers, are also guided by the grammaticality of the test items. This occurs in all conditions: in the singular verb morphology condition ($M = 4.69; SD = 0.46$ for grammatical items vs $M = 1.46; SD = 1.04$ for ungrammatical items), in the plural verb morphology condition ($M = 4.79; SD = 0.53$ for grammatical items vs $M = 1.79; SD = 1.38$ for ungrammatical items), and in the surrogate verb morphology condition ($M = 4.73; SD = 0.45$ for grammatical items vs $M = 1.37; SD = 0.84$ for ungrammatical items). Like the second language learners, the heritage speaker’s acquisition of verb morphology in imperatives seems to be positively correlated with their overall proficiency as measured by the DELE. Also, these data indicate that heritage speakers are sensitive to grammaticality in the singular verb morphology condition, but only those heritage speakers with intermediate and advanced proficiency levels show signs of receptive grammatical knowledge of the other two conditions tested.

With regard to the conditions looking at the acquisition of clitic placement in imperatives, the heritage speakers’ receptive grammatical knowledge seems to be enhanced by their overall proficiency, similar to the results found in second language learners. Also similar to their second language learner counterparts, the heritage speakers do not treat the two conditions tested differently. Figure 27 shows the heritage speakers’ acceptability of clitic placement in imperatives in comparison with the instructors’ ratings. Their responses are presented as a function of grammaticality, condition, and proficiency.
Figure 27 shows that, although grammatical items are massively accepted across proficiency levels, rejection of ungrammatical items develops as a function of proficiency. Beginners do not show sensitivity to grammaticality in either the affirmative ($M = 4.33; SD = 0.92$ for grammatical items vs $M = 3.94; SD = 1.12$ for ungrammatical items) or the negative ($M = 3.92; SD = 1.18$ for grammatical items vs $M = 3.69; SD = 1.31$ for ungrammatical items) conditions. However, intermediate heritage speakers do show signs of having receptive grammatical knowledge of clitic placement in imperatives in Spanish, unlike the second language learners. This receptive grammatical knowledge seems to have developed in both the affirmative ($M = 4.42; SD = 1.05$ for grammatical items vs $M = 2.47; SD = 1.23$ for ungrammatical items) and the negative ($M = 3.81; SD = 1.14$ for grammatical items vs $M = 2.31; SD = 1.19$ for ungrammatical items) conditions. The advanced heritage speakers, in turn, also have developed receptive grammatical knowledge of clitic placement in affirmative ($M = 4.75; SD = 0.62$ for grammatical items vs $M = 1.64; SD = 0.99$ for ungrammatical items) and negative ($M = 4.78; SD = 0.48$ for grammatical items vs $M = 1.90; SD = 1.39$ for ungrammatical items) imperatives. Finally,
the Spanish-dominant bilinguals’ responses are consistent with those given by the advanced heritage speakers in affirmative ($M = 4.69; SD = 0.46$ for grammatical items vs $M = 1.46; SD = 0.94$ for ungrammatical items) and negative ($M = 4.85; SD = 0.36$ for grammatical items vs $M = 1.31; SD = 0.65$ for ungrammatical items) imperatives. In conclusion, these data suggest that proficiency has a major effect on the acquisition of clitic placement in imperatives in heritage speakers, like it does in second language learners. This development along proficiency can be observed in the correlation between rejections of ungrammatical items and proficiency in both heritage speakers and second language learners. The AJT data also suggests that surrogate verb morphology is particularly challenging for second language learners. Additionally, the AJT data shows that heritage speakers outperform their proficiency-matched second language counterparts in singular verb morphology, which suggests that age of onset of acquisition of Spanish may play a role in the acquisition of these phenomena. The statistical models in the following section will test the results presented in this section.

The AJT data also provides information on the effect of lexical frequency on the participants’ receptive grammatical knowledge. Given that grammatical items were overwhelmingly accepted across conditions and proficiency levels, I present below the data on lexical frequency in the judgments of ungrammatical items. Also, the descriptive statistics presented above show that participants reject more ungrammatical items across conditions as their proficiency level increases. In line with the effects of lexical frequency in the production of accurate verb morphology in heritage speakers, it is expected that rejections emerge in the beginner group in more frequent lexical items. Figure 28 shows
the rejections of ungrammatical items across lexical frequency count in the conditions examining verb morphology in second language learners of different proficiency levels.

**Figure 28:** Rejections of ungrammatical items across lexical frequency count, verbal theme vowel and proficiency levels in L2 learners

Figure 28 shows that rejections may not be driven by lexical frequency. Instead, proficiency seems to be the main factor determining the second language learners’ rejections of ungrammatical items. These results are consistent with those presented in Figure 24 in that beginner and intermediate second language learners behave similarly and that the second language learners’ development in receptive grammatical knowledge of verb morphology in imperatives is observed in the step from intermediate to advanced proficiency. Table 11 presents the second language learners’ ratings of ungrammatical items across lexical item, condition, and proficiency level.
Table 11. Ratings of ungrammatical test items across lexical items and proficiency levels in second language learners

<table>
<thead>
<tr>
<th>Lexical Item</th>
<th>Beginner</th>
<th>Intermediate</th>
<th>Advanced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mirar ‘look at’</td>
<td>$M = 3.08; SD = 1.72$</td>
<td>$M = 3.44; SD = 1.34$</td>
<td>$M = 2.25; SD = 1.54$</td>
</tr>
<tr>
<td>Tomar ‘take’, ‘drink’</td>
<td>$M = 2.97; SD = 1.51$</td>
<td>$M = 3.11; SD = 1.32$</td>
<td>$M = 2.58; SD = 1.44$</td>
</tr>
<tr>
<td>Parar ‘stop’</td>
<td>$M = 2.92; SD = 1.21$</td>
<td>$M = 3.10; SD = 1.51$</td>
<td>$M = 1.67; SD = 1.11$</td>
</tr>
<tr>
<td>Beber ‘drink’</td>
<td>$M = 2.82; SD = 1.55$</td>
<td>$M = 3.39; SD = 1.46$</td>
<td>$M = 2.58; SD = 1.47$</td>
</tr>
<tr>
<td>Subir ‘lift’, ‘upload’</td>
<td>$M = 2.75; SD = 1.26$</td>
<td>$M = 2.90; SD = 1.18$</td>
<td>$M = 1.59; SD = 1.01$</td>
</tr>
<tr>
<td>Mojar ‘wet’, ‘soak’</td>
<td>$M = 2.92; SD = 1.35$</td>
<td>$M = 3.33; SD = 1.32$</td>
<td>$M = 1.63; SD = 1.18$</td>
</tr>
<tr>
<td>Batir ‘shake’</td>
<td>$M = 3.21; SD = 1.41$</td>
<td>$M = 3.19; SD = 1.57$</td>
<td>$M = 1.70; SD = 1.07$</td>
</tr>
<tr>
<td>Coser ‘sew’</td>
<td>$M = 3.13; SD = 1.47$</td>
<td>$M = 3.11; SD = 1.28$</td>
<td>$M = 2.5; SD = 1.35$</td>
</tr>
</tbody>
</table>

As seen in Figure 28, beginner and intermediate second language learners do not differ much in their judgments of ungrammatical test items. Indeed, beginners rated ungrammatical items lower than the intermediate group, which suggests that overall proficiency does not play a role in the development of receptive grammatical knowledge of verb morphology in imperatives in non-advanced second language learners.

Comparably, the heritage speakers’ results do not seem to be modulated by lexical frequency either. However, there may be between-group differences, unlike in the second language learners. Figure 29 shows the heritage speakers’ ratings of ungrammatical items in conditions examining verb morphology in imperatives across lexical frequency items.
and proficiency levels.

Figure 29: Rejections of ungrammatical items across lexical frequency count, verbal theme vowel and proficiency levels in heritage speakers

<table>
<thead>
<tr>
<th>Beginner</th>
<th>Intermediate</th>
<th>Advanced</th>
</tr>
</thead>
</table>

Overall, these results indicate that lexical frequency is not a factor in the judgments of ungrammatical items by heritage speakers. Also, there are between-group differences: the heritage speakers’ ratings decrease as their proficiency increases. In the second language learners’ group, this correlation was observed only between intermediate and advanced learners. Table 12 below presents the heritage speakers’ ratings of ungrammatical items across lexical items and proficiency levels.
Table 12. Ratings of ungrammatical test items across lexical items and proficiency levels in heritage speakers

<table>
<thead>
<tr>
<th></th>
<th>Beginner</th>
<th>Intermediate</th>
<th>Advanced</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Mirar</em> ‘look at’</td>
<td>$M = 3.62; SD = 1.43$</td>
<td>$M = 3.13; SD = 1.30$</td>
<td>$M = 2.10; SD = 1.28$</td>
</tr>
<tr>
<td><em>Tomar</em> ‘take’, ‘drink’</td>
<td>$M = 3.48; SD = 1.50$</td>
<td>$M = 3.27; SD = 1.28$</td>
<td>$M = 2.10; SD = 1.28$</td>
</tr>
<tr>
<td><em>Parar</em> ‘stop’</td>
<td>$M = 3.13; SD = 1.25$</td>
<td>$M = 2.57; SD = 1.50$</td>
<td>$M = 1.8; SD = 1.29$</td>
</tr>
<tr>
<td><em>Beber</em> ‘drink’</td>
<td>$M = 3.62; SD = 1.20$</td>
<td>$M = 3; SD = 1.20$</td>
<td>$M = 2.12; SD = 1.27$</td>
</tr>
<tr>
<td><em>Subir</em> ‘lift’ ‘upload’</td>
<td>$M = 3.67; SD = 1.05$</td>
<td>$M = 2.95; SD = 1.53$</td>
<td>$M = 1.83; SD = 1.20$</td>
</tr>
<tr>
<td><em>Mojar</em> ‘wet’, ‘soak’</td>
<td>$M = 3.2; SD = 1.32$</td>
<td>$M = 3.29; SD = 1.52$</td>
<td>$M = 1.62; SD = 1.06$</td>
</tr>
<tr>
<td><em>Batir</em> ‘shake’</td>
<td>$M = 3.67; SD = 1.11$</td>
<td>$M = 2.86; SD = 1.46$</td>
<td>$M = 2.08; SD = 1.38$</td>
</tr>
<tr>
<td><em>Coser</em> ‘sew’</td>
<td>$M = 3.67; SD = 1.02$</td>
<td>$M = 3.13; SD = 1.41$</td>
<td>$M = 2.43; SD = 1.45$</td>
</tr>
</tbody>
</table>

As seen in Table 12, theme vowel does not seem to play a role in the heritage speakers’ judgments of ungrammatical items. In the EPT, on the other hand, theme vowel seemed to have an effect on the heritage speakers’ production, as they produced less accurate verb morphology with verbs belonging to the second macroclass. Also, the beginner heritage speakers rated ungrammatical items higher than their second language learner counterparts.

To sum, this section on descriptive statistics has presented the effect of some independent variables on the development of receptive grammatical knowledge of the morphological and syntactic properties of imperatives in Spanish. Specifically, the participants’ AJT results seem to be modulated by differences in proficiency-based groups, grammaticality of the item, and age of onset of acquisition of English. In contrast with the EPT results, lexical frequency does not seem to be a determining factor in the
AJT data. These effects will be tested in the statistical models below. Like in the EPT models, the models below will include age of onset of acquisition of English among heritage speakers and patterns of Spanish use and exposure (Section 4.3.1) as independent variables.

5.3.3. Statistical models

In this section, I present the statistical models that analyzed the AJT data. A total of eight ordinal regressions were run. Specifically, two models analyzed the second language learners’ AJT data: one for verb morphology and another for clitic placement data. One additional model compares the acquisition of all five conditions tested across blocks to investigate the order in which they are acquired. Three more models were run for the heritage speakers’ data, for verb morphology, clitic placement, and order of acquisition, respectively. Finally, the two last models looked at the AJT data to find group differences between second language learners and heritage speakers in their verb morphology and in their clitic placement. Given that eight models were already run for the EPT data, I will refer to the first model in this section as the ninth model.

5.3.3.1. Second language learners

The ninth model examined the development of receptive grammatical knowledge of verb morphology in Spanish imperatives in the second language learners’ AJT data. The model included response, which ranged from 1 to 5, as its dependent variable, and grammaticality (whether the test item is grammatical or ungrammatical), condition (singular verb morphology, plural verb morphology, and surrogate verb morphology), proficiency as measured by their Spanish MiNT scores, lexical frequency and patterns of Spanish use and exposure as independent variables. Additionally, the model examined
interactions between grammaticality and proficiency and included random intercepts for each subject as well as for each lexical item.

The ninth model found differences as a function of grammaticality ($\beta = -1.85$, SE = 0.11, $z = -15.92$, $p < 0.01$), which indicates that the second language learners’ ratings decrease in ungrammatical items as opposed to grammatical items. Also, the model found differences across conditions. In comparison with the ratings that the second language learners gave items in the surrogate verb morphology condition, the model revealed that the items in the plural verb morphology condition were rated lower ($\beta = -0.35$, SE = 0.13, $z = -2.67$, $p < 0.01$), but the items in the singular verb morphology condition were not rated differently ($\beta = 0.01$, SE = 0.13, $z = 0.08$, $p = 0.93$). Figure 30 shows the second language learners’ acceptability of verb morphology as a function of the grammaticality of the test items and proficiency as measured by the Spanish MiNT scores.

Figure 30: Acceptability of verb morphology as a function of grammaticality and proficiency in second language learners
The model also revealed an effect of proficiency as measured by the second language learners’ Spanish MiNT scores ($\beta = 0.25$, SE $= 0.08$, $z = 2.96$, $p < 0.01$), indicating that, overall, the second language learners’ ratings decrease as their proficiency increases. An interaction between grammaticality and proficiency was also found ($\beta = -1.19$, SE $= 0.12$, $z = -9.74$, $p < 0.01$). This is evidenced in how rejections of ungrammatical items increase with proficiency, but acceptance of grammatical items remains steady. Finally, neither lexical frequency ($\beta = 0.01$, SE $= 0.05$, $z = 0.12$, $p = 0.90$) nor patterns of Spanish use and exposure ($\beta = 0.09$, SE $= 0.05$, $z = 1.73$, $p = 0.09$) were found to be significant factors.

The tenth model analyzed the clitic placement AJT data provided by the second language learners. The model included response as dependent variable, and grammaticality (whether the test item is grammatical or ungrammatical), condition (singular verb morphology, plural verb morphology, and surrogate verb morphology), proficiency as measured by their Spanish MiNT scores, and patterns of Spanish use and exposure as independent variables. Unlike the ninth model, this model did not examine the role of lexical frequency. The tenth model analyzed interactions between grammaticality and proficiency and included random intercepts for each subject as well as for each lexical item.

The tenth model revealed that grammaticality was a significant factor in the second language learners’ ratings of test items testing receptive grammatical knowledge of clitic placement ($\beta = -1.63$, SE $= 0.17$, $z = 9.68$, $p < 0.01$). Also, the model found that the second language learners’ responses were modulated by condition ($\beta = -0.38$, SE $= 0.15$, $z = -2.40$, $p = 0.01$): items testing clitic placement in affirmative imperatives were
rated higher than those in negative imperatives. Figure 31 shows the second language learners’ acceptability of clitic placement in imperatives as a function of grammaticality and proficiency.

The model also revealed that proficiency modulates the second language learners’ ratings ($\beta = 0.46$, SE = 0.13, $z = 3.49$, $p < 0.01$) as well as an interaction between grammaticality and proficiency ($\beta = -2.05$, SE = 0.20, $z = -9.83$, $p < 0.01$), which indicates that, as proficiency increases in second language learners, their ratings increase for grammatical items and decrease for ungrammatical items. The model did not find, however, patterns of Spanish use and exposure to be a significant factor ($\beta = 0.14$, SE = 0.08, $z = 1.80$, $p = 0.07$).

Finally, the eleventh model looked at the five conditions across proficiency in order to find if their acquisition followed a pattern. It included response as dependent
variable and condition and proficiency as independent variables. Given that less proficient participants tend to accept most items, this model focuses on ungrammatical test items. As in previous models, proficiency ($\beta = -1.12$, $SE = 0.08$, $z = -14.11$, $p < 0.01$) was revealed to be a determining predictor in the second language learners’ responses. Figure 32 shows the acceptability of conditions as a function of grammaticality and proficiency in second language learners.

![Figure 32: Acceptability of conditions as a function of grammaticality and proficiency in L2 learners](image)

The eleventh model, which had the clitic in affirmative imperative condition as a reference, revealed that only one condition was not judged differently by the second language learners: the surrogate verb morphology condition ($\beta = -0.35$, $SE = 0.19$, $z = -1.79$, $p < 0.07$). All other three conditions were judged differently by the participants. Specifically, the second language learners rated all other conditions lower. In descending order, the conditions that the second language learners judged lower than the clitic in
affirmative imperative condition were: the clitic in negative imperative condition ($\beta = -0.43, SE = 0.21, z = -2.01, p = 0.04$), the singular verb morphology condition ($\beta = -0.79, SE = 0.19, z = -4.04, p < 0.01$), and the plural verb morphology condition ($\beta = -1.09, SE = 0.19, z = -5.48, p < 0.01$). These findings indicate that second language learners may acquire clitic position and surrogate verb morphology at the same pace while verb morphology instantiating number features is acquired at lower proficiency stages.

### 5.3.3.2. Heritage speakers

The twelfth model analyzed the heritage speakers’ AJT data in order to determine which factors played a role in the development of their receptive grammatical knowledge of verb morphology in Spanish imperatives. The twelfth model included the same variables and random intercepts as the ninth model and examined the same interactions with the exception of age of onset of acquisition of English, which is a unique variable to the heritage speakers’ group. The twelfth model revealed differences as a function of grammaticality ($\beta = -2.96, SE = 0.13, z = -23.37, p < 0.01$), which indicates that heritage speakers rate ungrammatical items lower than grammatical items. The model did not find condition to be a significant factor, as heritage speakers treated items in the singular verb morphology condition ($\beta = -0.13, SE = 0.12, z = -1.01, p = 0.31$) and in the plural verb morphology condition ($\beta = 0.04, SE = 0.13, z = 0.36, p = 0.72$) similarly to those in the surrogate verb morphology condition, which was the condition for reference in the model. Figure 33 shows the heritage speakers’ acceptability of verb morphology as a function of grammaticality and proficiency.
The twelfth model also found that proficiency had an effect on the heritage speakers’ ratings ($\beta = 0.87$, $SE = 0.09$, $z = 8.88$, $p < 0.01$). Although heritage speakers’ ratings become higher overall as their proficiency increases, the interaction between proficiency and grammaticality found by the model indicates that, as the heritage speakers’ proficiency increases, they rate grammatical items higher and ungrammatical items lower ($\beta = -1.75$, $SE = 0.11$, $z = -15.37$, $p < 0.01$). This finding is consistent with the results yielded by the ninth model, looking at the second language learners’ AJT data.

The twelfth model found patterns of Spanish use and exposure to be a significant factor in the heritage speakers’ ratings ($\beta = -0.28$, $SE = 0.07$, $z = -4.09$, $p < 0.01$), suggesting that heritage speakers that reported using more Spanish rated test items lower in general. Age of onset of acquisition of English was also found to play a role in the heritage speakers’ ratings ($\beta = 0.15$, $SE = 0.07$, $z = 2.20$, $p = 0.02$), unlike in the EPT data. Lexical
frequency, finally, was not found to be a significant variable in the heritage speakers’ responses ($\beta = 0.05$, $SE = 0.05$, $z = 1.01$, $p = 0.31$), unlike in the EPT data, in which lexical frequency modulated the heritage speakers’ responses in the verb morphology conditions.

The thirteenth model examined the heritage speakers’ AJT data in order to determine which variables impacted the development of receptive grammatical knowledge of clitic placement in Spanish imperatives. With the exception of age of onset of acquisition of English, it included the same variables as the tenth model presented above as well as the same random intercepts. It also tested the same interactions. The tenth model found grammaticality to be a significant variable in the heritage speakers’ ratings ($\beta = -3.52$, $SE = 0.19$, $z = -17.91$, $p < 0.01$). This indicates that heritage speakers rated ungrammatical placed clitics lower than those items showing clitics in grammatical positions. The thirteenth model revealed, however, that condition (affirmative or negative imperative) did not play a role in the heritage speakers’ ratings ($\beta = -0.25$, $SE = 0.15$, $z = -1.60$, $p < 0.11$). Figure 34 shows the acceptability of clitic placement in imperatives as a function of grammaticality and proficiency in heritage speakers.
Like all the models presented above, the thirteenth model found proficiency to have an effect on the heritage speakers’ responses ($\beta = 0.70$, $SE = 0.14$, $z = 4.92$, $p < 0.01$). Overall, their ratings become higher as their proficiency increases. A closer look at the interaction between grammaticality and proficiency, however, shows us that, as the heritage speakers’ proficiency increases, their ratings become higher in grammatical test items, but they decrease in ungrammatical test items ($\beta = -1.92$, $SE = 0.17$, $z = -11.32$, $p < 0.01$). Unlike the twelfth model, the thirteenth model did not find patterns of Spanish use and exposure to be a significant predictor in the heritage speakers’ ratings ($\beta = -0.11$, $SE = 0.10$, $z = -1.09$, $p = 0.27$). Finally, the thirteenth model also found age of onset of acquisition of English to have an effect on the heritage speakers’ ratings ($\beta = 0.26$, $SE = 0.10$, $z = 2.63$, $p < 0.01$), consistently with the results yielded by the twelfth model.

Figure 35 shows the heritage speakers’ acceptability of the two condition blocks (verb...
As revealed by the models, age of onset of acquisition modulates the heritage speakers’ ratings in the AJT data. In Figure 35 it can be observed that, as the heritage speakers’ age of onset of acquisition of English increases, so does their gap between ratings of grammatical and ungrammatical test items. This indicates that those heritage speakers who acquired English later in their childhood have a more developed receptive grammatical knowledge of the morphological and syntactic properties of the imperatives in Spanish than their simultaneous bilingual counterparts.

The fourteenth model examined between-condition differences in the heritage speakers’ AJT data. It included response as dependent response, and condition and proficiency as independent variables. It only looked at ungrammatical test items, like the
eleventh model, which looked at this phenomenon in second language learners. The model revealed that proficiency, as measured by the heritage speakers’ MiNT scores, was a determining predictor ($\beta = -0.96, SE = 0.06, z = -15.47, p < 0.01$). Figure 36 shows how heritage speakers accepted test items as a function across conditions as a function of grammaticality and proficiency.

Figure 36: Acceptability of conditions as a function of grammaticality and proficiency in heritage speakers

The model showed that heritage speakers did not rate the clitic in affirmative imperative condition, which the model used as a reference, differently from two other conditions: the clitic in negative imperative condition ($\beta = -0.05, SE = 0.20, z = -0.26, p = 0.78$) or the singular verb morphology condition ($\beta = -0.08, SE = 0.18, z = -0.43, p = 0.66$). On the other hand, the two remaining conditions were judged differently. Specifically, heritage speakers rated the ungrammatical test items in these two conditions, surrogate and plural, higher than the three conditions discussed above, indicating a
seemingly lack of decisiveness. Differences were found between the clitic in affirmative imperative condition and the surrogate verb morphology condition ($\beta = 0.46$, $SE = 0.18$, $z = 2.53$, $p = 0.01$) and the plural verb morphology condition ($\beta = 0.49$, $SE = 0.18$, $z = 2.68$, $p < 0.01$). These findings suggest that heritage speakers may have stronger intuitions regarding clitic placement conditions than verb morphology conditions.

5.3.3.3. The role of age of onset of acquisition of Spanish in the acceptability data

The two models below examine whether differences exist between second language learners and heritage speakers regarding their AJT data. Both models are ordinal regressions that include response as dependent variable, and grammaticality, condition and group as dependent variables. The fifteenth model analyzes the verb morphology data while the sixteenth model examines the data on clitic placement.

The fifteenth model found that grammaticality was the only significant predictor ($\beta = -2.11$, $SE = 0.80$, $z = -26.34$, $p < 0.01$). On the other hand, the model did not find differences between the surrogate verb morphology condition and the singular verb morphology condition ($\beta = -0.05$, $SE = 0.09$, $z = -1.46$, $p < 0.14$) or the plural verb morphology condition ($\beta = -0.13$, $SE = 0.09$, $z = -1.46$, $p < 0.14$). The fifteenth model did not find differences between second language learners and heritage speakers ($\beta = -0.11$, $SE = 0.07$, $z = -1.63$, $p < 0.10$).

The sixteenth model, which focused on clitic placement AJT data, also found that grammaticality determined the participants’ responses ($\beta = -2.11$, $SE = 0.11$, $z = -18.43$, $p < 0.01$). Unlike the fifteenth model, the sixteenth model did reveal differences between conditions: participants rated items featuring negative imperatives lower than items in the affirmative imperative condition ($\beta = -0.24$, $SE = 0.10$, $z = -2.35$, $p = 0.02$). Finally, the
sixteenth model found group differences in the participants’ ratings of items testing clitic placement: overall, second language learners rated these items higher than heritage speakers (β = 0.32, SE = 0.11, z = 3.05, p < 0.01).

In summary, the six models analyzing the AJT data have found mixed results. First, all the models revealed that grammaticality and proficiency were significant factors. Similarly, they all found an interaction between grammaticality and proficiency. The models’ findings diverge in that condition (singular, plural or surrogate verb morphology in the first block or affirmative or negative imperative in the second block) is only a significant factor for second language learners but not for heritage speakers, and that patterns of Spanish use and exposure only was only found to be significant in the heritage speakers’ ratings of verb morphology. The two models examining the heritage speakers’ AJT data revealed that their age of onset of acquisition of English had an effect on their ratings. Age of onset of acquisition of Spanish, on the other hand, only was significant in the receptive grammatical knowledge of clitic placement while second language learners and heritage speakers were not found to behave differently when rating the acceptability of verb morphology. Finally, lexical frequency was not a determining factor in any model that included it as a dependent variable.

5.4. Conclusion

In this chapter, I have presented the results from the Elicited Production Task (EPT) and the Acceptability Judgment Task (AJT) as well as the results provided by a series of models examining the importance of the variables included in this dissertation. The findings discussed in this chapter allow us to answer our Research Questions:
Research Question 1, which focused on the acquisition of the morphological and syntactic properties of imperatives in Spanish across conditions, can be answered with the data from both the EPT and the AJT. Second language learners and heritage speakers acquire all properties examined in this dissertation as their proficiency increases. Overall, singular verb morphology is acquired at lower proficiency stages than the other morphological properties tested, and clitic placement in negative imperatives is more challenging than in affirmative imperatives.

When taking a closer look to the models examining between-condition differences, it is noticeable that second language learners acquire singular verb morphology at lower proficiency stages in both production and comprehension. That acquisition milestone is followed by the acquisition of surrogate verb morphology and clitic placement, which occurs simultaneously at high proficiency stages, given that the data has not found differences in these conditions. The heritage speakers, on the other hand, present a more complicated pattern. Their production indicates that they acquire all the properties under examination differently while their acceptability data suggests that clitic placement is less challenging than verb morphology. This difficulty in verb morphology, particularly in the productive task, might stem from lexical frequency effects.

Research Question 2, which inquired about the role of extra-linguistic factors, can also be answered with the results discussed above. First, proficiency was a determining factor in all groups and tasks. Second, patterns of Spanish use and exposure was found to be a significant predictor only in the heritage speakers’ acceptability of verb morphology. Age of onset of acquisition of Spanish, on the other hand, determined the participants’
responses in all tasks except in the acceptability of verb morphology, in which second language learners and heritage speakers behaved similarly. Finally, age of onset of acquisition of Spanish in the heritage speakers’ group only modulated their receptive grammatical knowledge, but not their production.

Finally, Research Question 3, which tackled the role of lexical frequency in the acquisition of verb morphology, can also be solved with this chapter’s findings. Specifically, lexical frequency has an effect on the heritage speakers’ production of verb morphology. It does determine the second language learners’ production or any group’s receptive grammatical knowledge.
Chapter 6:
Discussion

6.1. Introduction

In Chapter 5, I presented the results from the Elicited Production Task (EPT), the Acceptability Judgment Task (AJT), as well as the correlations between those results and several factors: age of onset of acquisition of Spanish and English, Spanish proficiency, patterns of language use and exposure, and lexical frequency. In this chapter, I will discuss these findings and how they answer the Research Questions presented in Chapter 4. Additionally, I will use the findings from this cross-sectional study to describe the acquisition process that second language learners and heritage speakers follow across proficiency.

This chapter will be organized as follows. First, Section 6.2 will address the acquisition of the syntactic and morphological properties of the imperative in Spanish in second language learners and heritage speakers, followed by a discussion on the implications of these findings. In Section 6.3, I will present the findings on the impact of extra-linguistic factors on the acquisition of the properties under examination in both groups. In Section 6.4, I will discuss how lexical frequency plays a role in the performance of these bilinguals. Finally, In Section 6.5 I use the results of the present study to model the acquisition of imperatives in Spanish in second language learners and heritage speakers. A summary of the chapter and a brief conclusion will be found in Section 6.6.
6.2. The acquisition of Spanish imperatives in second language learners and heritage speakers

This section discusses the first research question of this study and the findings that it generated. It first presents the findings yielded by the second language learner group, followed by a discussion on the acquisition of imperatives in heritage speakers. In the end of this section, a series of implications to these findings are explored.

6.2.1. The acquisition of Spanish imperatives in second language learners

The first research question that guides this study investigates whether the acquisition of the syntactic and morphological properties of the Spanish imperatives among English-speaking heritage speakers and second language learners of Spanish shows a pattern of order in the acquisition of syntax and morphology, as shown in their production and receptive grammatical knowledge. I hypothesized that, following previous research on the order of acquisition of different language components in second language acquisition (Jiang, 2000; Lardiere, 2008, 2009; Slabakova, 2019), syntax would be acquired in earlier proficiency stages than morphology. In order to address this research question, it was divided into three sub-questions targeting different phenomena, which were operationalized into five conditions.

The data analysis in Chapter 5 shows the second language learners’ pattern of order in the acquisition of the properties of the Spanish imperatives across their proficiency. First, in the lower end of proficiency, second language learners produce grammatical singular verb morphology and reject ungrammatical singular (e.g., *¡Marta, mira la película!) and plural (e.g., *¡Amigos, mira la nueva película de terror!) test items. These findings suggest that low-proficient second language learners of Spanish
acquire the features addressee, person, and number. Additionally, they present asymmetric results in plural verb morphology: their receptive grammatical knowledge is more target-like than their production in this condition.

Second, the following acquisition phenomena occur in advanced second language learners, who were the only ones who produced grammatical instances and rejected ungrammatical test items of the conditions under examination. These proficient second language learners reject ungrammatical items testing clitic placement in negative imperatives (e.g., *¡Marta, no déjalo!), followed by rejections of ungrammatical surrogate verb morphology (e.g., *¡María, no toma el sol!) and clitic placement in affirmative imperatives (e.g., *¡Felipe, lo llama!) in the highest end of proficiency. On the other hand, proficient second language learners produced grammatical instances of surrogate verb morphology, plural verb morphology, and clitic placement in affirmative imperatives. Finally, in the highest end of proficiency, second language learners produced grammatical instances of clitic placement in negative imperatives. Altogether, these results suggest that the three conditions that examine the acquisition of movement in the CP layer occur only in proficient second language learners.

Prima facie, when looking at specific structures, namely the morphological instantiation of addressee, person and number features, the findings are consistent with previous proposals on the order of acquisition of language components in second language acquisition (Jiang, 2000; Lardiere, 2008, 2009; Slabakova, 2019). However, when comparing the acquisition of the morphological instantiation of those features with the acquisition of clitic placement in both affirmative and negative imperatives, verb morphology precedes syntactic knowledge across proficiency stages, which indicates that
the acquisition of syntax does not precede morphological competence across all structures. Additionally, the asymmetry between receptive grammatical knowledge and production in the condition examining clitic placement in negative imperatives is consistent with previous proposals claiming that receptive grammatical knowledge is developed earlier than production, which is more challenging (Lardiere, 2008, 2009). is consistent with existing proposals on the order of acquisition of the different language components in second language acquisition (Jiang, 2000; Lardiere, 2008, 2009; Slabakova, 2019):

In summary, the acquisition of Spanish imperatives in English-speaking second language learners follows a specific pattern: First, low-proficient second language learners acquire the features addressee, person, and number, as shown by their receptive grammatical knowledge and production. Specifically, low-proficient second language learners show receptive grammatical knowledge of number, both plural and singular, and, once their proficiency increases, such knowledge is also noticeable in their production. This is followed by the target-like production of plural verb morphology, evidencing the asymmetry between receptive grammatical knowledge and productive knowledge. Second, proficient second language learners acquire the syntactic movement that occurs in the CP layer of Spanish imperatives. This is evidenced in the fact that the only second language learners who showed above chance results in their production and judgments were those who scored more than 40/50 in the DELE and were situated at the upper end of the lexical knowledge range as measured by the MiNT. These proficient second language learners also show an asymmetry between their receptive grammatical knowledge and their productive knowledge in the condition examining clitic placement in
negative imperatives. In conclusion, the acquisition of Spanish imperatives in second language learners presents a pattern of order in the acquisition of its language components: first, the features addressee, person, and number, both singular and plural, followed by their morphological instantiations; second, the syntactic movement in the CP layer, in which receptive grammatical knowledge occurs earlier than productive knowledge across proficiency levels. These findings are incongruous with proposals on the acquisition of language components in second language acquisition which claim that syntax is acquired earlier than morphology (Jiang, 2000; Lardiere, 2008, 2009; Slabakova, 2019). Particularly, these findings challenge previous proposals in that not all syntactic structures precede morphological competence in second language acquisition, as opposed to the Bottleneck Hypothesis (Slabakova, 2019), which claims that functional morphology is the main challenge in second language acquisition. These findings provide the opportunity to revise previous proposals, such as Lardiere’s (2008, 2009) Feature Reassembly Hypothesis, in order to bring a more fine-grained perspective to the study of the acquisition process of different language components: instead of showing categorical acquisition steps in which syntax precedes morphology, second language learners acquire different syntactic and morphological properties in different stages. In this study, second language learners acquired syntax and morphology related to the VP followed by the acquisition of more complex syntax in the CP layer and of morphology triggered by such complex syntactic operations, namely surrogate verb morphology. This contrast in the nature of the structures under examination might account for the order in which they are acquired, particularly given the difficulty in the acquisition of structures in the C-domain (Platzack, 2001). The late acquisition of surrogate verb morphology is due to such
difficulty in the acquisition of syntactic operations in the C-domain, particularly when combined with the blocking effects derived from the presence of a negative phrase, which lead to heavy computational costs that delay the acquisition of verb morphology. Finally, the results yielded by this study are consistent with previous models in some aspects; specifically, as seen in the data, the acquisition process of imperatives in Spanish by second language learners can lead to asymmetries between receptive grammatical knowledge and productive knowledge (Jiang, 2000; Lardiere, 2008, 2009; Slabakova, 2019).

6.2.2. The acquisition of Spanish imperatives in heritage speakers

In this section, I aim to answer the first research question that guides this study. Above, I discussed the findings in second language learners while in this section I focus on the heritage speakers’ results. Specifically, I investigate whether the acquisition of the syntactic and morphological properties of the Spanish imperatives shows a pattern of order in the acquisition of syntax and morphology in heritage speakers, as shown in their production and their receptive grammatical knowledge. As for the second language learners and consistently with previous models of second language acquisition (Jiang, 2000; Lardiere, 2008, 2009; Slabakova, 2019), I hypothesized that syntax would be acquired in earlier proficiency levels than morphology. With the goal of answering this research question, I operationalized it into five conditions looking at different phenomena.

Chapter 5 found a pattern in the order of acquisition of the syntactic and morphological properties of the Spanish imperatives shown by heritage speakers across proficiency. First, regarding receptive grammatical knowledge, low-proficient heritage
speakers rejected three ungrammatical conditions at similar rates: singular verb
 morphology (e.g., *¡Marta, mires la película!), clitic placement in affirmative (e.g., *¡Felipe, lo llama!) and negative (e.g., *¡Marta, no déjalo!) imperatives. This is matched by the production of grammatical instances of the same conditions: singular verb morphology, and clitic placement in affirmative and negative imperatives. As shown by the descriptive statistics and Figures 14, 26 and 27 in Chapter 5, the acquisition of the feature addressee as well as of the syntactic movement in the CP layer of Spanish imperatives is noticeable in heritage speakers whose proficiency is not situated at the end of the proficiency range: those heritage speakers who scored between 20 and 40 as measured in the DELE and did not achieve the highest results in the MiNT showed that they had knowledge of the feature addressee and of the syntactic movement in the CP layer.

Secondly, the target-like production and receptive grammatical knowledge of surrogate and plural verb morphology occurs only in proficient heritage speakers, as only those heritage speakers who scored above 40/50 in the DELE and achieved the highest scored in the MiNT produced grammatical instances of these conditions above chance and rejected ungrammatical items testing these conditions. These proficient heritage speakers showed knowledge of all conditions involving the syntactic movement in the CP layer and the feature number.

In sum, heritage speakers show a pattern in the order of acquisition of the properties of the Spanish imperatives. Across proficiency levels, low- and intermediate proficient heritage speakers show knowledge of the feature addressee as well as of the syntactic movement occurring in the CP layer. Proficient heritage speakers, in turn, also
show knowledge of surrogate verb morphology, indicating that all the phenomena involved in the CP layer are not acquired in the same proficiency stage. Additionally, only proficient heritage speakers show knowledge of plural verb morphology as shown by their production and acceptability judgment data. In contrast with the second language learners, the acquisition of Spanish imperatives in Spanish does not show asymmetries between productive and receptive grammatical knowledge. This contrasts with Putnam and Sánchez’s (2013) proposal and suggests the need to fine-tune proposals on activation. Finally, heritage speakers and second language learners present a different acquisition path: while second language learners acquire all the properties involved in the syntactic movement occurring in the CP layer in the same proficiency stage, heritage speakers do so in two different proficiency stages as determined by their MiNT-based lexical knowledge. Heritage speakers show knowledge of clitic placement with and without the blocking effects derived from the presence of a negative phrase; however, knowledge of surrogate verb morphology is only shown by advanced heritage speakers. Following the syntactic accounts for imperatives in Spanish presented in this study (Alcázar & Saltarelli, 2014; Rivero & Terzi, 1995), I argue that heritage speakers have knowledge of the blocking effects that the presence of negative phrases implies in imperatives in Spanish given their knowledge of clitic placement across conditions. The heritage speakers’ challenge lies in their difficulty to recover their heritage language morphology. This is also evidenced in their results regarding the acquisition of the feature number, which is only acquired by advanced heritage speakers too, and in how lexical frequency modulates their morphological competence. Overall, the findings yielded by the heritage
speakers’ data are consistent with Putnam and Sánchez (2013), who argue that heritage speakers can present difficulties with mapping syntactic features into morphology.

6.2.3. The acquisition of imperatives in Spanish: findings from second language learners and heritage speakers

The two subsections above have discussed the acquisition of imperatives in the two groups under examination. The two groups present a different pattern in the order of acquisition of the properties of the imperative in Spanish. In particular, this cross-sectional study shows that, in second language learners, morphological competence of some properties is achieved before the acquisition of syntactic properties involving the CP layer, namely clitic placement. On the other hand, heritage speakers show a contrasting pattern: clitic placement is acquired at lower proficiency stages than number verb morphology, which is consistent with previous models on second language acquisition that emphasize how challenging the acquisition of functional morphology is (Slabakova, 2019). Within the syntactic properties under examination, an additional pattern of order of acquisition appears to be evidenced too: addressee and person features precede the acquisition of the syntactic movement in the CP layer across proficiency in both second language learners and heritage speakers. However, the two groups differ in the order in which they acquire number features in imperatives in Spanish: second language learners show knowledge of plural forms in both their production and receptive grammatical knowledge in intermediate proficiency levels while only advanced heritage speakers show similar results in the same condition. Indeed, number, particularly the morphological instantiation of plural number, is the last feature to be acquired across proficiency in the heritage speaker group.
The fact that the acquisition of conditions that involve the acquisition of the syntactic movement in the CP (i.e., surrogate verb form in negative imperative clauses and its consequences on clitic placement) occurred at similar proficiency stages in both second language learners and heritage speakers is consistent with some syntactic accounts that have been developed for the imperatives in Spanish. Both Rivero and Terzi’s (1995) V-movement and logical mood in imperatives and Alcázar and Saltarelli’s (2014) Light Performative Hypothesis claim that the CP layer hosts a syntactic operator containing the pragmatic-semantic features conveying directive meaning in imperative clauses. Specifically, Rivero and Terzi (1995) claim that imperative verb forms raise to check that syntactic operator; however, negative phrases, when present, occupy their position and cause a syntactic movement leading to the use of a surrogate verb hosted in a lower position. Consequently, as a result of the different syntactic properties of imperative and surrogate verb forms, clitic placement varies according to the presence of a negative phrase. Alcázar and Saltarelli (2014), in turn, specify that number features are hosted in a lower position. The different positions occupied by the different syntactic properties under examination (i.e., addressee features, syntactic movement, and number features) seems to have an impact in its acquisition in second language learners and heritage speakers. Specifically, those features related to the VP, namely person and number, are acquired early by second language learners, as opposed to clitic placement, which requires movement to the CP layer. Heritage speakers, on the other hand, present an opposed pattern: movement to the CP layer is acquired in low proficiency stages while plural verb morphology, hosted in the VP, is only acquired by advanced heritage speakers. This consistency between syntactic accounts and the acquisition of such
syntactic properties in the present study supports the claims made by Rivero and Terzi (1995) and Alcázar and Saltarelli (2014) that imperatives in Spanish involve movement to the CP layer given how the participants in this study treated the structures under examination differently according to their syntactic position.

Additionally, the data provided by both second language learners and heritage speakers support the idea that the presence of a negative phrase has blocking effects on the movement of the main verb to the CP layer as clitic placement in affirmative sentences was less challenging than in negative sentences for both non-dominant bilingual groups. Indeed, 12 second language learners and 8 heritage speakers produced at least one instance of ungrammatical enclitic in negative imperatives during the EPT (e.g., *¡No búscalo! ‘Do not look for him!’); however, no instances of ungrammatical proclitics in affirmative imperatives were produced (e.g., *¡Lo busca! ‘Look for him!’). Most speakers who produced ungrammatical enclitics in negative imperatives showed variability in their responses and also produced instances of grammatical proclitics in the same condition, which suggests that the acquisition of verb movement to the CP layer precedes the acquisition of the blocking effects derived from the presence of a negative phrase.

The difference between second language learners and heritage speakers in the proficiency level at which they show knowledge of number features, as shown by their productive and receptive grammatical knowledge of plural verb forms, can be accounted for by their different learning experiences. Indeed, second language learners have been shown to outperform heritage speakers in metalinguistic awareness, particularly morphology, as a result of their classroom learning, while heritage speakers have
acquired Spanish in a naturalistic setting (Bowles, 2011; Correa, 2011; Montrul, 2010c, 2011; Montrul, Foote & Perpiñán, 2008a, 2008b). Their different learning experiences may have also led to different input opportunities: second language learners are presented with plural imperative verb forms in textbooks and orally, given that instructors may address several hearers when they express a command. Heritage speakers, on the other hand, may not always receive formal instruction in their heritage language. Additionally, they may not be exposed to commands addressed to more than one hearer. These reasons are to be confirmed by corpus data from classroom and home settings.

The pattern of order of acquisition in which verb movement and blocking effects are the last properties to be acquired in imperatives is shared by adult second language learners and Spanish-speaking children. Similar to the participants in this study, Spanish-speaking children show no difficulty in the acquisition of singular imperative verb forms, which are acquired early (Ezeizabarrena, 1997; Grinstead, 1998). However, Ezeizabarrena (1997) argues that the production of singular imperative verb forms by Spanish-speaking children does not imply that they have knowledge of all the syntactic properties involved in imperatives in Spanish. Indeed, Spanish-speaking children do not show consistent adult-like surrogate verb forms in negative imperative clauses until the age of 3;00 (Ezeizabarrena, 1997). Grinstead (1998) claims that Spanish-speaking children do not produce any sort of negative command before that age. This view was criticized by Gathercole et al. (2002), who states that the acquisition of the surrogate verb forms in negative commands in Spanish is lexically driven and children can produce non-adult forms, namely unanalyzed chunks, before they master the pertinent syntactic and morphological properties (e.g., *no toca ahí* instead of *no toques ahí* ‘do not touch there’,...
no caga instead of no cagues ‘do not poop’, no cupeh instead of no escupas ‘do not spit’). In summary, Spanish-speaking children, adult heritage speakers, and adult second language learners present a clear pattern in the order of acquisition of these two syntactic phenomena: in Spanish-speaking children, singular verb forms are acquired before negative imperative clauses and surrogate verb forms, as documented chronologically in longitudinal studies, while adult heritage speakers and second language learners present a similar pattern, as shown by a cross-sectional study looking at participants with different proficiency levels. In the section 6.4 below, Gathercole et al.’s (2002) argument for the lexically-driven nature of the acquisition of surrogate verb morphology in Spanish-speaking children will be compared to the acquisition of verb morphology in the participant groups of this study in order to determine whether their acquisition is modulated by lexical frequency, too.

The pattern of order of acquisition shown by the second language learners presents a challenge for previous literature claiming that the acquisition of syntax precedes the acquisition of morphology (Jiang, 2000; Lardiere, 2008, 2009; Slabakova, 2019) given that morphological competence for some aspects of imperatives in Spanish was achieved at low proficiency stages while more complex syntactic operations, namely verb raising and the blocking effects of the negative phrase, had only been acquired by advanced second language learners. The contrast between the acquisition of syntax and morphology has also been pointed out by literature in psycholinguistics: Ullman’s (2001) Declarative/Procedural Model claims that syntax and morphology employ different cognitive skills. Particularly, the lexicon is stored in the declarative memory, upon which knowledge on facts and events depends and which is rooted in the temporal lobe
structures. On the other hand, grammar depends on the procedural memory, which is responsible for motor the acquisition and expression of motor and cognitive skills and habits and is rooted in the left frontal/basal-ganglia structures. Ullman (2001) clarifies that lexicon includes non-compositional words (e.g., cat), bound morphemes (e.g., -ed), and idiomatic phrases (e.g., kick the bucket) while grammar includes rules, operations, constraints, and structures. Ullman (2001, 2005) proposes that, in second language learners, both grammar and lexicon are stored in the declarative memory and, as their experience with the second language increases through exposure and practice, second language learners will shift their grammar knowledge to their procedural memory. The author claims that information is acquired faster via declarative memory and that shifting such information to the procedural memory is challenging, particularly in late second language acquisition.

Ullman’s model is consistent with the findings yielded by the second language learners in this study only if we consider that not all areas of the grammar need to be developed before morphological competence, which is part of the lexicon. The results provided by the second language learners show that they first acquired syntactic and morphological properties that do not involve movement in the CP layer: addressee, person, and number. However, only the advanced second language learners show knowledge of clitic placement with imperatives, a phenomenon that entails a more complex syntactic operation. Only advanced second language learners, thanks to extensive experience with Spanish as a second language, had shifted these complex syntactic properties to their procedural memory.

Ullman’s model can also account for the results yielded by the heritage speakers.
As claimed by Ullman, the information stored in the declarative memory is learned faster, but it is also more vulnerable to decay. Specifically, the heritage speakers’ morphological competence presents variability in their production and comprehension according to how frequently they activate their heritage language: the production of verb morphology is modulated by lexical frequency while their comprehension, as measured by the AJT, presents differences according to their reported patterns of language use and exposure. These findings are consistent with Putnam and Sánchez (2013) and support Pérez-Cortés, Putnam, and Sánchez’s (2019) concept of differential access to the heritage language. Pérez-Cortés et al. (2019) propose that heritage languages are not easily lost across the lifespan; instead, some elements of the heritage language grammar are more particularly challenging to access. This difference in difficulty across areas of grammar leads to different acquisition outcomes across such areas of grammar. These variable outcomes include morphological optionality. In sum, the results from both the second language learners and the heritage speakers evidence the dynamicity of morphological competence as opposed to the stability of syntactic knowledge. On the one hand, second language learners show knowledge of verb morphology in low proficiency stages while only the most proficient heritage speakers show knowledge of plural verb morphology as shown in their production and comprehension. On the other hand, heritage speakers show a solid syntactic knowledge in low and intermediate proficiency stages whereas only the most advanced second language learners show knowledge of clitic placement in imperatives. Overall, this is consistent with Ullman’s proposal that the information stored in the declarative memory can easily store information as well as fail to retain it through time,
as opposed to the information stored in the procedural memory, namely grammar in this case, which is difficult to manage to retain and also to forget.

In sum, the findings of this study present a challenge to previous literature on second language acquisition. Specifically, these findings are incongruous with proposals that argue that the acquisition of syntactic properties precedes the acquisition of morphological competence (Jiang, 2000; Lardiere, 2008, 2009; Slabakova, 2019). First, the Bottleneck Hypothesis (Slabakova, 2019), which claims that functional morphology is the last language component to be acquired by second language learners, is not supported by this study, as a purely syntactic operation appears to be more challenging than some functional morphology for the second language learners in this study. Similarly, Lardiere’s (2008, 2009) Feature Reassembly Hypothesis, which claims that the mapping of syntactic features into morphology is the main challenge for second language learners, could be revised in the light of the findings of this study: the second language learners manage to re-assemble number features into morphology at low proficiency stages while only advanced second language learners show knowledge of a purely syntactic operation.

6.3. The impact of extra-linguistic factors on the acquisition of the Spanish imperative

This section is guided by the second research question formulated in the present study. This second research question investigated whether a series of extra-linguistic factors have an effect on the knowledge of the morphological and syntactic properties of the Spanish imperatives under examination. Specifically, the extra-linguistic factors taken into consideration in this study are patterns of language use and exposure, proficiency in
Spanish, and age of onset of acquisition of Spanish and English. Chapter 5 analyzed the effect of these factors in the second language learners’ and heritage speakers’ data.

First, I hypothesized that patterns of language use and exposure would have an impact on the acquisition of the properties of the Spanish imperative. In heritage language acquisition, this hypothesis would be consistent with Putnam and Sánchez’s (2013) activation approach, which claims that frequency of activation in the heritage language for production and comprehension purposes leads to heritage language maintenance. On the other hand, for second language learners, the activation of their second language has an effect on their overall second language proficiency and automaticity (De Carli et al., 2015; Gollan et al., 2008; Paradis, 1993), which has an impact on their performance in production and comprehension tasks.

The experimental data obtained to confirm the hypotheses above provides mixed results: the participants’ patterns of language use and exposure only play a role in the heritage speakers’ receptive grammatical knowledge. These findings partially confirm my hypothesis regarding heritage speakers. Consistently with Putnam and Sánchez’s (2013) activation approach, the activation of the heritage language for production and comprehension purposes, as measured by the heritage speakers’ self-reported background language questionnaires, plays a role in the maintenance of their receptive grammatical knowledge. On the other hand, the findings yielded by the experimental data are not consistent with previous proposals on the role of the activation of the second language in second language acquisition: these findings do not confirm the hypothesis that I formulated regarding second language learners, which claimed stated that the second
language learners’ knowledge of phenomena under examination would be modulated by their self-reported patterns of language use and exposure.

The proposals that claim that language activation plays a role in the acquisition of heritage and second languages also posit that overall proficiency is linked to patterns of language use and exposure and to the acquisition of specific linguistic phenomena in both heritage and second language acquisition (De Carli et al., 2015; Gollan et al., 2008; Paradis, 1993; Putnam & Sánchez, 2013). Following these proposals, I hypothesized that proficiency would have an effect on the acquisition of the properties of the Spanish imperatives. The results yielded by the analyses on the experimental data on both heritage and second language speakers show that proficiency is correlated with the two groups’ productive and receptive grammatical knowledge: lexical proficiency as measured by the MiNT is positively correlated with their responses in the production and comprehension tasks. These results confirm my hypothesis with regards to both heritage speakers and second language learners. These findings are consistent with previous research that has documented that proficiency in the heritage or second language is correlated with the acquisition of specific syntactic phenomena (Clements & Domínguez, 2017; Cuza & Frank, 2011; Guijarro-Fuentes, 2012; Hawkins & Casillas, 2008; Hopp, 2017; Guijarro-Fuentes, 2012; Montrul & Sánchez-Walker, 2013). Please recall that the MiNT is a measure of lexical proficiency that has been found to be correlated with overall proficiency (Bedore et al., 2012; Gollan et al., 2012; Sheng et al., 2014; Treffers-Daller & Korybski, 2015). In this study, as shown in Chapter 5, the participants’ MiNT and DELE scores were correlated and their MiNT scores were chosen for statistical analysis in order to use a fair tool to measure proficiency that is not constrained by reading and writing
skills, which can be particularly challenging for heritage speakers (Colombi, 2000; Colombi & Roca, 2003; Parodi, 2008; Torres, 2016).

Age of onset of acquisition of bilingualism is also strictly related to how frequently the non-dominant language, Spanish, has been activated for production and comprehension purposes throughout the bilinguals’ lifetime. For the second language learners in this study, who are all native speakers of English and second language learners of Spanish, I considered their age of onset of bilingualism the moment in which they started learning Spanish in spite of many of them reporting growing up with different heritage languages. With regard to the heritage speakers, in turn, whose native language is always Spanish at least, their age of onset of bilingualism was considered to be the beginning of their acquisition of English. As seen in Section 4.3.1, 34 heritage speakers were simultaneous bilinguals while the remaining 24 were sequential bilinguals.

The second research question of this study inquired about the role of age onset of bilingualism, operationalized as age of onset of acquisition of Spanish and English. Following proposals that argue that second language activation plays a role in its acquisition, I hypothesized that the second language learners’ knowledge of the properties of the Spanish imperative would be different than the knowledge shown in the data yielded by the heritage speakers given that heritage speakers have activated Spanish throughout their lifetime. The data presented in Chapter 5 confirms this hypothesis: heritage speakers, who acquired Spanish since birth, show results closer to those of their comparison groups than their second language learner counterparts, whose onset of acquisition of Spanish occurred after their childhood. Specifically, heritage speakers and second language learners differ in their overall production knowledge and in their
receptive grammatical knowledge of clitic placement. However, no differences were found between the two groups regarding their receptive grammatical knowledge of imperative verb morphology. Nonetheless, these results are consistent with claims on the relationship between language activation and second language acquisition (De Carli et al., 2015; Gollan et al., 2008; Paradis, 1993) as well as with other studies that documented differences between heritage speakers and second language learners, in which the heritage speakers’ knowledge as shown by their production or comprehension of Spanish morphosyntax resembled more the results provided by dominant speakers used as a comparison group (Cuza & Frank, 2015; Cuza & López Otero, 2016; Montrul, 2010a; Montrul, 2010b; Montrul, 2011; Montrul, Foote & Perpiñán, 2008b).

Finally, the last extra-linguistic factor examined by the second research question of this study also looks at the effects of age of onset of bilingualism. Particularly, it investigates the role of age of onset of English in the heritage speaker group. Following Putnam and Sánchez’s (2013) activation approach which claims that frequency of activation of the heritage language for production and comprehension purposes has an effect on heritage language acquisition and maintenance, I hypothesized that age of onset of acquisition of English is correlated with the heritage speakers’ knowledge as measured by their productive and receptive grammatical knowledge. Specifically, I expected the results yielded by simultaneous bilinguals and those bilinguals who started acquiring English in their early childhood to present more differences with the comparison group’s, comprised of dominant Spanish speakers, than those heritage speakers who acquired English in their late childhood. My expected results were supported by the statistical analysis, which confirms my hypothesis. Particularly, age of onset of acquisition of
Spanish has an effect on the receptive grammatical knowledge of both clitic placement and imperative verb morphology. It does not, however, impact the heritage speakers’ production of any phenomena under examination. These findings indicate that the acquisition of both Spanish and English simultaneously or the acquisition of English during early childhood may lead to early co-activation of the heritage speakers’ languages and to permeability of their receptive grammatical knowledge. This view is consistent with Putnam and Sánchez’s (2013) activation approach: the heritage speakers who acquired English in their late childhood and, therefore, had experienced a longer period of constant activation of their heritage language, showed a more target-like receptive grammatical knowledge than those heritage speakers who, because they acquired English early in their lifetime, experienced co-activation of their two languages or inhibited their heritage language. These findings are consistent with previous studies documenting the effects of age of onset of acquisition of English in English-speaking heritage speakers of Spanish (Giancaspro, 2017; Montrul, 2002; Montrul, Davidson, de la Fuente & Foote, 2014; Pascual y Cabo & Gómez-Soler, 2015).

In sum, second research question of this study has examined the impact of several extra-linguistic factors on the acquisition of syntactic and morphological properties of the Spanish imperatives. The extra-linguistic factors under examination have in common that they are direct or indirect operationalizations of language activation. In this section, I presented that all the extra-linguistic factors play a role in the acquisition of the phenomena investigated in this study, which are also shown in Table 13 below.
Table 13. Effects of the extra-linguistic factors under examination across groups and tasks

<table>
<thead>
<tr>
<th>Group</th>
<th>Second language learners</th>
<th>Heritage speakers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task</td>
<td>Production</td>
<td>Receptive grammatical knowledge</td>
</tr>
<tr>
<td>MiNT-based proficiency</td>
<td>Significant predictor</td>
<td>Significant predictor</td>
</tr>
<tr>
<td>Age of onset of acquisition</td>
<td>Differences found between L2ers and HSs in verb morphology and clitic placement: HSs outperform L2ers</td>
<td>Differences found between L2ers and HSs only regarding clitic placement: HSs outperform L2ers</td>
</tr>
<tr>
<td>Patterns of language exposure and use</td>
<td>No effects found</td>
<td>No effects found</td>
</tr>
</tbody>
</table>

First, proficiency effects occur in both heritage speakers and second language learners while the effects of patterns of language use and exposure seem to be restricted to heritage speakers. This contrast in the factors that modulate the two groups’ acquisition process is the result of their different type of bilingualism. Most second language learners present similar patterns of language use and exposure: English, their native and dominant language, is the language they use the most for production and comprehension purposes. On the other hand, the heritage speakers present more complex patterns of language use and exposure that show they inhibit their heritage language is diverse contexts throughout their daily life. Given the correlation between patterns of language use and receptive grammatical knowledge of verb morphology, it can be argued that bilingual acquisition is
shaped by language competition, namely the activation of the socially dominant language and the inhibition of the heritage language. These findings are consistent with previous proposals on the role of language competition in the bilingual mind of heritage speakers (Putnam & Sánchez, 2013); however, this study found that receptive grammatical knowledge and not production were modulated by the heritage speakers’ language use and exposure while Putnam and Sánchez (2013) point out that production is more prone to variability than comprehension. Finally, age of onset of bilingualism accounts for the differences in the results provided by heritage speakers and second language learners (i.e., age of onset of acquisition of Spanish) and between simultaneous and early sequential bilinguals vs sequential heritage speakers who acquired English in their late childhood. These findings support the role of the critical period in bilingual acquisition as well as the importance of language competition in bilinguals, particularly of inhibiting the heritage language, which leads to the difficulty to recover grammar areas of the heritage language (Putnam & Sánchez, 2013). Indeed, heritage speakers who acquired English later in their childhood and, therefore, were Spanish-speaking monolinguals for longer are less likely to experience changes in their heritage language as opposed to simultaneous bilinguals, who show signs of permeability in their Spanish as a result of activating their dominant language and inhibiting their heritage language since their early childhood. In sum, in this section I have argued that these findings are consistent with claims that language activation and language competition are crucial in the acquisition of second and heritage languages (De Carli et al., 2015; Gollan et al., 2008; Paradis, 1993; Putnam & Sánchez, 2013).
6.4. The role of lexical frequency on the acquisition of the Spanish imperative

This section focuses on the third research question posed by this study, which investigates the role of lexical frequency in the acquisition of Spanish as a second and heritage language. Lexical frequency, also referred to as ‘token frequency’, is “how often a particular form appears in the input” (Ellis & Collins, 2009, p. 330), which in this study has been operationalized into the eight verbs used in the experimental tasks, as described in Chapter 4. Following Putnam and Sánchez’s (2013) activation approach, which claims that activation of the heritage language is crucial for its acquisition and maintenance, Giancaspro (2017) and Hur (forthcoming), lexical frequency can be used as an operationalized proxy for heritage language activation: high frequency lexical items are expected to be activated more often than those who appear less frequently in the input. This difference may have an effect in the outcomes of the re-assembly of features needed for the production and comprehension of the phenomena under examination in this study.

Similarly, the acquisition of morphology and syntax in second language learners has been argued to be sensitive to lexical frequency effects (Ellis, 2002; Ellis & Collins, 2009, inter alia) and to frequency of activation (De Carli et al., 2015; Gollan et al., 2008; Paradis, 1993), particularly in relation to the automaticity of morphological and syntactic knowledge. In the light of the claims above, I hypothesized that lexical frequency modulates the performance of production and receptive grammatical knowledge in heritage speakers and second language learners.

However, this hypothesis is only partially confirmed by the data analysis, as presented in Chapter 5. I examined the correlation between self-reported lexical frequency and morphosyntactic knowledge of verb morphology in imperative clauses, as
shown in the participants’ production and receptive grammatical knowledge. Lexical frequency effects were found in the heritage speaker’s productive knowledge: the heritage speakers’ production was closer to the dominant bilinguals’ in those lexical items that were reported to be more frequent in their input and their output, as measured by the Lexical Frequency Self-Rating Task that heritage speakers and second language learners were asked to complete. On the other hand, their production differed more in those test items including infrequent lexical items. This finding is consistent with my hypothesis. Nevertheless, no frequency effects were found in the heritage speakers’ receptive grammatical knowledge. These mixed findings indicate that lexical frequency has asymmetric effects: it impacts the heritage speakers’ production but not their receptive grammatical knowledge. Similar results have been reported by Hur (forthcoming), who found lexical frequency effects in the production of DOM in intermediate heritage speakers, but not in their receptive grammatical knowledge. Giancaspro (2017), on the other hand, did find lexical frequency effects in the productive and receptive grammatical knowledge of subjunctive of heritage speakers. As opposed to the heritage speakers, the second language learners’ acquisition of verb morphology in imperative clauses is not modulated by lexical frequency. The second language learners’ performance in the experimental tasks does not confirm my hypothesis and is not consistent with previous works documenting the effects of lexical frequency in the acquisition of morphosyntax in second language learners. These findings contrast with the lexical frequency effects found in the heritage speakers. In sum, my hypothesis is partially confirmed: lexical frequency effects modulate the performance of heritage speakers in their production, but not in their receptive grammatical knowledge, while the
second language learners’ performance is not impacted by lexical frequency in either their production or their grammatical judgments. These findings are summarized in Table 14 below.

Table 14. Lexical frequency effects across groups and tasks

<table>
<thead>
<tr>
<th>Group</th>
<th>Task</th>
<th>Second language learners</th>
<th>Heritage speakers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Production</td>
<td>Receptive grammatical knowledge</td>
<td>Production</td>
</tr>
<tr>
<td>Lexical frequency</td>
<td>No effects found</td>
<td>No effects found</td>
<td>Significant predictor only in verb morphology</td>
</tr>
</tbody>
</table>

The contrast between heritage speakers and second language learners regarding the impact of lexical frequency on the acquisition of imperatives in Spanish can be accounted for in terms of language activation: heritage speakers have inhibited their heritage language since their childhood, particularly for production purposes, and the lexical items to which they are exposed the most are highly frequent. On the other hand, second language learners have not inhibited their non-dominant language since their childhood, are encouraged to activate their second language for both production and comprehension purposes in classroom settings and are exposed to a broad variety of registers and topics of the language that they are learning. Therefore, the two groups’ experiences with language activation and competition in the bilingual mind explain why lexical frequency effects are restricted to heritage speakers and specifically to their productive skills. The asymmetry found in the lexical frequency effects between receptive grammatical knowledge and production is consistent with Putnam and Sánchez’ (2013) proposal, but not with other proposals (Gollan, Slattery, Goldenberg,
van Assche, Duyck, & Rayner, 2011), which claim that lexical frequency has an effect on comprehension while production is modulated by other factors, namely semantic constraints.

Consistently with the heritage speakers’ results, the acquisition of imperatives and other verb paradigms in monolingually raised Spanish-speaking children is not error-free and is modulated by lexical effects, namely their development does not occur uniformly across all lexical items (Gathercole et al., 1999, 2002). Gathercole et al. (2002) claim that monolingually raised Spanish-speaking children produce non-adult-like verb forms in imperative clauses. For instance, they argue that, instead of the surrogate or suppletive verb form used in negative imperative clauses, monolingually raised Spanish-speaking children may produce present indicative or a rote-learned possible phonetically reduced form of the verb (e.g., no toca ahí instead of no toques ahí ‘do not touch there’, no caga instead of no cagues ‘do not poop’, no cupeh instead of no escupas ‘do not spit’) as well as adult-like forms (e.g., no limpies ‘do not clean’, no comas ‘do not eat’). However, the authors do not discuss whether lexical frequency could account for this variability.

Overall, the acquisition of the surrogate verb forms in Spanish imperatives appears to be challenging for both Spanish-speaking children and heritage speakers of Spanish, as found in the heritage speakers in this study and in other studies examining the acquisition of imperatives in Spanish-speaking children (Ezeizabarrena, 1997; Grinstead, 1998). It is not possible to determine, however, whether those non-adult-like productions are the result of a developing syntax or morphology given the data presented by Gathercole et al. (1999, 2002). Specifically, as they do not present data on clitic placement in the imperatives produced by the children in their study, it cannot be
determined whether the Spanish-speaking children in the study have acquired the syntactic movement involved in negative imperative clauses or whether their productions are the results of a developing morphological competence. In the case of the heritage speakers in this study, as discussed in the answer to the first research question guiding this study, the syntactic movement in the CP layer motivated by the presence of a negative phrase in an imperative clause is acquired, examined by looking at clitic placement, is acquired at lower proficiency stages, unlike surrogate verb morphology, which is only mastered by advanced heritage speakers.

The role of morphological competence is also evidenced by another finding revealed in the heritage speakers’ results. Please be reminded that the third research question in this study inquired on the role of lexical frequency in the acquisition of verb morphology and I operationalized that research question by testing the participants’ productive and receptive grammatical knowledge of different conditions with eight verbs featuring a wide range of lexical frequency count as determined by the LFSRT that the participants completed. Additionally, I included verbs belonging to the two macroclasses in which inflectional verb morphology is categorized in Spanish: the first macroclass is composed of Class I verbs (i.e., verbs in -ar) while the second macroclass is composed of Class II verbs (i.e., verbs in -er) and Class III verbs (i.e., verbs in -ir). As seen in Figure 15 and Table 9 in Chapter 5, the second language learners’ production of verb morphology does not present any variability in terms of inflectional macroclass or class. On the other hand, the heritage speakers’ production of verb morphology does appear to be modulated by the macroclass to which the verbs under examination belong. Specifically, as seen in Figure 16 and Table 10, heritage speakers produce more target-
like instances of verb morphology with verbs belonging to the first macroclass (e.g., *mojar* ‘to wet’, *parar* ‘to stop’, *tomar* ‘to take’, *mirar* ‘to look at’) than to the second macroclass (e.g., *coser* ‘to sew’, *batir* ‘to shake’, *subir* ‘to lift’, *beber* ‘to drink’). This contrast between the heritage speakers’ responses to verbs belonging to the first macroclass versus those belonging to the second macroclass indicates that lexical frequency, as seen in the varied lexical frequency counts presented by the eight verbs under examination, may not be the only factor modulating their responses. As discussed in section 3.5, Aguirre and Dressler (2006) indicate that 90% of the verbs in Spanish fall into the first macroclass, while verbs in the second macroclass are less frequent. Therefore, this difference in the heritage speakers’ responses might be the results of type frequency effects. Please recall that type frequency “refers to the number of distinct lexical items that can be replaced in a given slot in a construction” (Ellis & Collins, 2009, p. 330). In this particular case, different lexical items, namely the verb roots or lexemes, are subject to lexical frequency, while the different macroclasses seem to be subject to type frequency. Previous studies have found type frequency effects in second language acquisition (Collins et al., 2009; Ellis & Ferreira-Junior, 2009; McDonough & Kim, 2009; Wulff et al., 2009; Year & Gordon, 2009); however, to my knowledge, no previous studies have documented cases of type frequency in the acquisition of Spanish as a heritage language.

In conclusion, this section has discussed that lexical frequency effects exist in the heritage speakers’ production of verb morphology. Nonetheless, those effects were not found in their receptive grammatical knowledge or in the second language learners’ performance. These results can be accounted for in terms of language competition in the
bilingual mind. Please recall that heritage speakers inhibit their heritage language, particularly for production purposes, which could explain the asymmetry of lexical frequency effects: they are restricted to productive skills. Additionally, the heritage speakers’ production of verb morphology appears to be modulated by type frequency given that the variability in their responses seems to be consistent with the contrast between inflectional verb macroclasses in Spanish.

6.5. Modeling the acquisition path of imperatives in Spanish in second language learners and heritage speakers

In the light of the findings presented above, in this section I present a model describing the acquisition path of imperatives in Spanish followed by second language learners and heritage speakers. For both groups, the model will include a series of stages of acquisition of the syntactic and morphological properties of the imperative in Spanish under examination.

6.5.1. Modeling the acquisition of imperatives in Spanish among second language learners

The acquisition of imperatives in Spanish among English-speaking second language learners presents three clearly defined stages. The first stage spans from low to intermediate proficiency as measured by the DELE, while the participants who scored over 40 in the DELE are situated in the two final stages. Proficiency modulates the second language learners’ acquisition of the imperatives in Spanish; however, no other factors were found to shape their acquisition.

In the first stage, second language learners have receptive grammatical knowledge of the features addressee, person, and number, as they show target-like judgements of the
conditions looking at singular and plural verb morphology. In this stage, participants provide asymmetrical results: in their production they only show knowledge of singular verb morphology. Overall, in this stage second language learners show evidence of acquisition of functional morphology while clitic placement, a purely syntactic operation, is still to be acquired. This contrast may be accounted for by the syntactic positions of these phenomena: the former are hosted in the VP while the latter are positioned in the CP layer. In this stage, the second language learners have not acquired any phenomena in the CP layer. Indeed, they may not have knowledge that true imperatives verb forms are hosted in the CP layer.

In the second stage, second language learners have receptive grammatical knowledge of the remaining phenomena under examination: clitic placement in both affirmative and negative imperatives as well as surrogate verb morphology. Also, they produce plural and surrogate verb morphology as well as target-like clitic placement in affirmative imperatives, but not in negative imperatives. In this stage, second language learners have acquired properties positioned both in the VP and in the CP, as they show that they have knowledge that true imperatives in Spanish are hosted in the CP.

In the third and final stage, second language learners produce target-like clitic placement in negative imperatives. The asymmetry found between the receptive grammatical knowledge and the production of clitic placement, particularly in negative imperatives, can be the result of computational costs derived from the blocking effects from the negative phrase and the clitic climbing in the surrogate verb form.

In sum, the findings yielded by the second language learners’ data evidence that functional morphology can be acquired earlier across proficiency stages than purely
syntactic operations. These findings present a challenge to existing proposals on second language acquisition that claim that morphology is the last language component to be acquired, after syntax (Lardiere, 2008, 2009; Slabakova, 2019).

6.5.2. Modeling the acquisition of imperatives in Spanish among heritage speakers

The acquisition of imperatives in Spanish in heritage speakers presents two main stages. The first stage includes low and intermediate heritage speakers, as measured by the DELE, while the second stage includes those speakers who scored over 40 in the DELE. The acquisition of the imperatives in Spanish is shaped by several factors in heritage speakers: proficiency, patterns of language use and exposure, and lexical frequency.

In the first stage, heritage speakers show acquisition of the receptive grammatical knowledge of addressee and person features, and clitic placement in both affirmative and negative imperatives. They also produce target-like singular verb morphology as well as clitics in affirmative imperatives above chance. Their knowledge of clitic placement shows evidence that they know that true imperatives in Spanish are hosted in the CP layer. In contrast with the second language learners, heritage speakers show a more stable knowledge of purely syntactic operations as opposed to morphological competence, consistently with Putnam and Sánchez (2013).

In the second stage, heritage speakers, as second language learners, produce target-like clitics in negative imperatives. This is the only instance of asymmetry between receptive grammatical knowledge and productive knowledge found in the heritage speakers’ data, possibly due to computational costs in online production, similarly to second language learners. In the first and second stages, their production of verb
morphology is shaped by lexical frequency, particularly in the conditions examining the production of plural and surrogate verb morphology, which require a shift in the verb theme vowel (e.g., ¡paren! ‘(you guys) stop!’, ¡no pares! ‘do not take!’ for *parar* ‘to take’ or ¡beban! ‘(you guys) drink!’, ¡no bebas! ‘do not drink!’ for *beber* ‘to drink’), as shown in Figure 21 in Chapter 5.

In the third stage, heritage speakers acquire the receptive grammatical knowledge and the productive knowledge of the feature number. Similarly, heritage speakers show knowledge of surrogate verb morphology. These results are symmetrical and occur across receptive and productive knowledges. Also, these findings point out to the difference between acquisition of phenomena hosted in the VP and the CP. This contrast is also found in the second language learners, but their order is the opposite: while second language learners acquire phenomena in the VP earlier across proficiency stages and proficient participants acquire those in the CP layer, heritage speakers show a rather stable knowledge of purely syntactic phenomena in the CP layer and a more variable receptive and productive knowledges of the phenomena in the VP. This variability in their verb morphology is consistent with views on differential access in heritage language (Pérez-Cortés et al., 2019) and can be accounted for by lexical frequency (Giancaspro, 2017; Hur, forthcoming). Such variability derived from their morphological competence is the reason why surrogate verb morphology is not acquired in earlier proficiency stages given that, along with the conditions looking at clitic placement, the condition examining surrogate verb morphology also examines the acquisition the syntactic operations involving movement in the CP layer, particularly the blocking effects from the negative phrase. The production of more target-like verb forms in this last stage leads to a
reduction of variability in their morphology. As seen in Figure 16 in Chapter 5, variability across lexical items features a larger range in low and intermediate heritage speakers. Therefore, it may be argued that lexical frequency shapes the production of low and intermediate heritage speakers, but not of advanced heritage speakers, consistently with the results found by Hur (forthcoming).

6.6. Conclusion

This chapter has presented responses to the research questions posed in this study as well as a discussion on the findings. This study’s first research question has found that both second language learners and heritage speakers present a clear pattern of order of acquisition. First, second language learners acquire verb morphology earlier across proficiency than purely syntactic operations, which challenges previous literature on second and heritage language acquisition (Jiang, 2000; Lardiere, 2008, 2009; Slabakova, 2019). On the other hand, heritage speakers present a more stable knowledge of syntactic properties as opposed to morphological competence across proficiency stages in this study, consistently with Putnam and Sánchez (2013). These findings present a challenge for previously presented proposals on the acquisition of language components in second language learners: not all syntactic phenomena are acquired before some parts of their second language morphology are mastered. These findings have implications for expanding previous proposals into fine-grained models in which morphology is not conceived as the last language component to be acquired regardless of the complexity shown by some syntactic areas.

The second research question found that, overall, the responses given by heritage speakers were more target-like than those provided by proficiency-matched second
language learners. In addition, the heritage speakers’ responses were found to be modulated by extra-linguistic factors. Specifically, their receptive grammatical knowledge was influenced by their patterns of language use and exposure. Within the heritage speakers, age of onset of acquisition played a role too, as the responses given by those heritage speakers who started acquiring English later in their childhood were closer to the responses given by Spanish-dominant bilinguals than those given by their simultaneous bilingual counterparts. This difference within heritage speakers suggests effects of permeability in their heritage language as a result of early co-activation between Spanish and English. Overall, these results are consistent with Putnam and Sánchez’s (2013) approach on the need for activating the heritage language for production and comprehension purposes in order to acquire it and maintain it.

Finally, the third research question found that lexical frequency modulated the production of verb morphology in heritage speakers but not in second language learners. Such effect was not found in their receptive grammatical knowledge. Additionally, type frequency, as seen in the two inflectional verb morphology macroclasses, seems to modulate the heritage speakers’ production also. This mismatch between the effect of lexical frequency in productive vs receptive grammatical knowledge is consistent with Putnam and Sánchez’s (2013) activation approach: heritage speakers activate their heritage language more frequently for comprehension than for production purposes, which results in different outcomes.

The effects of lexical frequency found in the heritage speakers’ production in this study as consistent with previous studies documenting the acquisition of syntactic (Hur, forthcoming) and morphosyntactic structures (Giancaspro, 2017). These findings have
pedagogical implications for the teaching of heritage languages. Particularly, heritage learners would benefit from exposure and production of lexical items that they consider infrequent or that belong to topics or registers to which they are rarely exposed. The activation of these infrequent lexical items for production and comprehension purposes could decrease the lexically-driven variability in their responses and ultimately contribute to the professionalization of their heritage language skills.
Chapter 7

Conclusion

The present study documented the production and receptive grammatical knowledge of imperatives in Spanish among second language learners and heritage speakers, as well as of Spanish language instructors and Spanish-dominant Spanish-English bilinguals, used as comparison groups for the non-dominant bilinguals. The goal of this dissertation is to investigate whether the acquisition of the syntactic and morphological properties of the imperatives in Spanish presents a pattern of order of acquisition, as well as to examine whether the acquisition of such properties is modulated by extra-linguistic factors, such as proficiency, patterns of language use and exposure, and age of onset of acquisition of Spanish and English. Additionally, this study also examines whether within-subject variability in second and heritage language morphological competence can be accounted for in terms of lexical frequency.

The findings provided by this study indicate that, across proficiency levels, the acquisition of some verb morphology precedes the acquisition of purely syntactic operations in second language learners, contrarily to second language acquisition proposals claiming that morphology is the most challenging and last language component to acquire (Lardiere, 2008, 2009; Slabakova, 2019). In heritage speakers, morphology presents more variability than syntax, particularly in low and intermediate groups, consistently with Putnam and Sánchez (2013). Furthermore, the findings reveal that proficiency, as measured by the MiNT and the DELE, is correlated with the acquisition of imperatives. In addition, the patterns of language use and exposure have an effect on
the receptive grammatical knowledge of heritage speakers. Finally, the present study also found that lexical frequency modulates the productive knowledge of heritage speakers. This study features innovations in that it used a self-reported lexical frequency measure instead of lexical frequency information collected from corpora and that it found lexical frequency effects after controlling for morphological regularity and number of syllables in the verbs under examination. While these findings contribute to the field of second language and heritage language acquisition, this study presents some limitations, which I discuss below. This chapter also discusses suggestions for further research on this topic.

7.1. Limitations of the study

The first limitation of the findings is related to the cross-sectional nature of the study. Recall that the participants in this study presented different proficiency levels as determined by their lexical knowledge, as measured by their Spanish MiNT scores, and by their morphosyntactic and lexical knowledge, as measured by the DELE. In this study, I analyzed the participants’ data by using their Spanish MiNT scores as a continuous variable while some of the figures were created using their DELE scores, as specified in Chapter 5. The findings on the order of acquisition of the properties under examination remain to be confirmed in a longitudinal study that tests the participants’ knowledge across time. Examining these phenomena across time would be particularly insightful in heritage speakers given how early imperatives appear in L1 acquisition.

The second limitation of the study is associated with the constraints in the language background questionnaires. Due to administrative reasons, the questionnaire did not include questions on birthplaces or international travels. Therefore, the present study was not able to gather information on whether some heritage speakers had been born
abroad and had been exposed to only Spanish until they moved to the US as opposed to those sequential bilinguals that acquired English in their early childhood but might have been exposed to it since birth. Similarly, the lack of information on international travel prevented this study to examine whether the knowledge of the phenomena under examination is modulated by the amount of time that the participants, either second language learners or heritage speakers, have spent in a Spanish-speaking country. The examination of this correlation would have provided meaningful insights related to language activation and to the role of input outside the classroom, which might be the reason behind the different results in how patterns of language use and exposure shapes the receptive grammatical knowledge of heritage speakers but not of second language learners.

The third limitation of the study is the unbalanced number of heritage speakers: most of the heritage speakers were advanced as determined by their DELE scores. On the other hand, the number of participants in the second language learners’ DELE-based proficiency groups were similar. Due to this limitation, I only analyzed the two groups’ data together once in order to determine whether age of onset of acquisition of Spanish (since birth for the heritage speakers and after puberty for the second language learners).

7.2. Further research

Given the findings of the current study as well as the limitations presented in the section above, some directions for further research are proposed below: an examination of the input that the second language learners receive in the language classroom, the study of the input to which heritage speakers are exposed at home, the need to investigate the role of lexical frequency in the studies on morphosyntax in second and heritage
language acquisition as a possible source for within-subject variability, and a closer look at type frequency, particularly in theme vowels in inflectional verb morphology. Finally, I encourage scholars to test these findings, particularly those which may have implications in second language acquisition theories.

The first direction for further research that I would like to address is the need for the examination of the input that second language learners receive in the language classroom. Imperative verb forms are covered in Spanish language textbooks and syllabi; however, their use in the classroom might be restricted by pragmatic factors. Therefore, it would be necessary to investigate how commands are expressed in the language classroom; particularly, whether they are expressed by using imperative verb forms or by using alternative expressions, such as interrogatives (e.g., ¿Podrías abrir el libro? ‘Could you open the book?’) or statements (e.g., Ahora vamos a abrir el libro. ‘Now we are going to open the book.’). Determining whether imperative verb forms, with and without clitics, are used in the classroom is crucial to understand the acquisition of the phenomena under examination in this study.

Similarly, examining corpora documenting the input and output of heritage speakers and their context could provide meaningful insights to the study of the acquisition of imperatives in heritage Spanish. Pragmatic factors might play a role in the acquisition of imperatives in heritage speakers too. For instance, in families where the heritage speaking child does not have any siblings, plural commands might not be as frequent, which might have an effect on their acquisition. Corpora that document the linguistic production and input of heritage children throughout their language
development may be helpful to confirm whether the order of acquisition of found in this study is comparable to the order of acquisition followed by child heritage speakers.

A third direction for future research is the need to continue investigating the role of lexical frequency as a source of within-subject variability in second and heritage language acquisition. Following Giancaspro (2017) and Hur (forthcoming), this study uses lexical frequency as a proxy for language activation (Putnam and Sánchez, 2013). This study innovated in the introduction of a self-reported lexical frequency test in which participants responded how frequently they used or were exposed to a given lexical item. Additionally, this study found lexical frequency effects after controlling for morphological regularity and number of syllables in the verbs under examination. In order to confirm that lexical frequency plays a role in the acquisition of heritage languages, future research could continue investigating the role of lexical frequency by controlling the form of the verbs in the test items as well as by using a lexical frequency measure that reflects the participants’ experience.

The fourth direction is related with the notion of type frequency, which refers to “the number of distinct lexical items that can be replaced in a given slot in a construction” (Ellis & Collins, 2009, p. 330). The present study seemingly found type frequency effects in the acquisition of verb morphology in heritage speakers; specifically, it appears that the theme vowel of the verbs in the test items modulated the heritage speakers’ production: more target-like responses were produced with verbs belonging to the first macroclass (verbs ending in -ar, such as mirar ‘to look at’ or tomar ‘to take’) than with verbs belonging to the second macroclass (verbs ending in -er and -ir verbs), which are not as frequent in the Spanish language (Aguirre & Dressler, 2006). However,
as type frequency was not part of the scope of the research questions of the study, this phenomenon was not analyzed in Chapter 5 and barely discussed in Chapter 6. The examination of the role of type frequency, particularly theme vowels in inflectional verb morphology, may account for within-subject variability in the acquisition of verb paradigms that present a vowel change in their morphology, such as the subjunctive in Spanish.

Finally, I encourage scholars to examine the acquisition of purely syntactic operations and morphosyntax in second language learners to test my findings and develop a sophisticated second language acquisition model that informs on what morphological components can be acquired earlier and what areas of syntax are particularly challenging even after the second language learners have mastered parts of their second language morphology.
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Harris, J. (1999). Nasal depalatalization no, morphological wellformedness si; the structure of Spanish word classes. MIT Working Papers in Linguistics, 33, 47-82.


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Appendices

Appendix A: IRB-approved consent form

ATTACHMENT 4: CONSENT FORM

INFORMED CONSENT FORM

You are invited to participate in a research study that is being conducted by Julio Cesar Lopez Otero, a PhD student in the Department of Spanish and Portuguese at Rutgers University. The purpose of this research is to study the acquisition of Spanish in English-Spanish bilinguals.

Approximately 200 subjects will participate in the study, and each individual’s participation will last approximately 60 minutes. There will be only one session per participant.

The study procedures include (1) completing a language background questionnaire, (2) two Spanish proficiency tests, (3) narrate a short story with the help of a wordless book, (4) answering questions about stories and pictures that you will be presented, (5) determine if a series of sentences sound correct to you, and (6) determine whether some words are common or rare. All oral tasks will be recorded with a microphone.

This research is confidential. Confidential means that the research records will include some information about you and this information will be stored in such a manner that some linkage between your identity and the response in the research exists. Some of the information collected about you includes which languages you speak, your proficiency in such languages and how often you use them. You will not be asked any sensitive information that may identify you. However, some information regarding your linguistic profile (e.g., languages you speak, age, etc.) and your voice prints in the recordings might identify you. Please note that we will keep this information confidential by limiting individual’s access to the research data and keeping it in a secure location. The data will be transcribed and stored in a password-protected Box.com account.

The research team and the Institutional Review Board at Rutgers University are the only parties that will be allowed to see the data, except as may be required by law. If a report of this study is published, or the results are presented at a professional conference, only group results will be stated. All study data will be kept indefinitely after the completion of the study.

The risks of participation include: There are no foreseeable risks to participation in this study.

You have been told that the benefits of taking part in this study may be: practicing your own languages. However, you may receive no direct benefit from taking part in this study. You will receive a $10 gift card for completing the entire study.

Participation in this study is voluntary. You may choose not to participate, and you may withdraw at any time during the study procedures without any penalty to you. In addition, you may choose not to answer any questions with which you are not comfortable.

For IRB Use Only. This Section Must be Included on the Consent Form and Cannot Be Altered Except For Updates to the Version Date.
If you have any questions about the study or study procedures, you may contact us:
Julio Cesar Lopez Otero
Academic Building, 15 Seminary Place (Office: S183). College Ave. Campus
New Brunswick, NJ 08901
jllopez@rutgers.edu
+1 765 409 0761

You may also contact our faculty advisor:
Liliana Sánchez
Academic Building, 15 Seminary Place (Office: AB-5171). College Ave. Campus
New Brunswick, NJ 08901
lsanchez@rutgers.edu

If you have any questions about your rights as a research subject, please contact an IRB Administrator at the Rutgers University, Arts and Sciences IRB:

Institutional Review Board
Rutgers University, the State University of New Jersey
Liberty Plaza / Suite 3200
335 George Street, 3rd Floor
New Brunswick, NJ 08901
Phone: 732-235-2866
Email: humansubjects@orsp.rutgers.edu

You will be given a copy of this consent form for your records.

Sign below if you agree to participate in this research study:

Subject (Print) __________________________________________

Subject Signature __________________________ Date ____________

Principal Investigator Signature __________________ Date ____________
Audio/Visual Addendum to Consent Form

You have already agreed to participate in a research study entitled: The acquisition of Spanish grammar among English-Spanish bilinguals, conducted by Julio Cesar Lopez Otero. We are asking for your permission to allow us to record your voice as part of that research study. You do not have to agree to be recorded in order to participate in the main part of the study.

The recording(s) will be used for linguistic analysis by the research team.

The recording(s) will include your narration of a short story based on a wordless book, your answers to questions based on short preambles, and your decision on how correct some sentences sound to you. If you say anything that you believe at a later point may be hurtful and/or damage your reputation, then you can ask the interviewer to rewind the recording and record over such information OR you can ask that certain text be removed from the dataset/transcripts.

The recording(s) will be stored in a password-protected Box.com account to which only the research team will have access. No identifying information will be asked during the procedure. The recordings will be kept indefinitely after the completion of the study.

Your signature on this form grants the investigator named above permission to record you as described above during participation in the above-referenced study. The investigator will not use the recording(s) for any other reason than that/those stated in the consent form without your written permission.

Subject (Print) __________________________________________

Subject Signature __________________________ Date ________________

Principal Investigator Signature __________________________ Date ________________

For IRB Use Only. This Section Must be Included on the Consent Form and Cannot Be Altered Except For Updates to the Version Date.
Appendix B: Diploma de Español como Lengua Extranjera (DELE) test

DELE TEST

Project Title: ________________________________
Participant Code: ____________________________
Date: ________________________________

_____________________________
Prueba de opción multiple (from DELE TEST)

Por favor, complete los espacios en blanco con la palabra que mejor corresponda.

1. Al oír del accidente de su buen amigo, Paco se puso __________.
   a. alegre  b. cansado  c. hambriento  d. triste

2. No puedo comprarlo porque me ____________.
   a. falta  b. dan  c. presta  d. regalan

3. Tuvo que guardar cama por estar ____________.
   a. enfermo  b. vestido  c. ocupado  d. parado

4. Aquí está tu café, Juanito. No te quemes, que está muy ____________.
   a. dulce  b. amargo  c. agrio  d. caliente

5. Al romper los anteojos, Juan se asustó porque no podía ________ sin ellos.
   a. discurrir  b. oír  c. ver  d. entender

6. ¡Pobrecita! Está resfriada y no puede ____________.
   a. salir de casa  b. recibir cartas  c. respirar con dificultad  d. leer las noticias

7. Era una noche oscura sin ________.
   a. estrellas  b. camas  c. lágrimas  d. Nubes

8. Cuando don Carlos salió de su casa, saludó a un amigo suyo: -Buenos días, ____.
   a. ¿Qué va?  b. ¿Cómo es?  c. ¿Quién es?  d. ¿Qué tal?

9. ¡Qué ruido había con los gritos de los niños y el _______ de los perros!
   a. olor  b. sueño  c. hambre  d. ladrar
10. Para saber la hora, don Juan miró el _______.
    a. calendario  b. bolsillo  c. estante  d. despertador
11. Yo, que comprendo poco de mecánica, sé que el auto no puede funcionar sin ___.
    a. permiso  b. comer  c. aceite  d. bocina
12. Nos dijo mamá que era hora de comer y por eso ______.
    a. fuimos a nadar  b. tomamos asiento  c. comenzamos a fumar  d. nos acostamos pronto
13. ¡Cuidado con ese cuchillo o vas a _______ el dedo!
    a. cortarte  b. torcerse  c. comerte  d. quemarte
14. Tuvo tanto miedo de caerse que se negó a _______ con nosotros.
    a. almorzar  b. charlar  c. cantar  d. patinar
15. Abrió la ventana y miró: en efecto, grandes llamas de _______ salían de las casas.
    a. zorros  b. serpientes  c. cuero  d. fuego
16. Compró ejemplares de todos los diarios pero en vano. No halló ______.
    a. los diez centavos  b. el periódico perdido  c. la noticia que deseaba  d. los ejemplos
17. Por varias semanas acudieron colegas del difunto profesor a _______ el dolor de la viuda.
    a. aliviar  b. dulcificar  c. embromar  d. estorbar
18. Sus amigos pudieron haberlo salvado pero lo dejaron ___________.
    a. ganar  b. parecer  c. perecer  d. acabar
19. Al salir de la misa me sentía tan caritativo que no pude menos que _______ a un pobre mendigo que había allí sentado.
    a. pegarle  b. darle una limosna  c. echar una mirada  d. maldecir
20. Al lado de la Plaza de Armas había dos limosneros pidiendo ________.
   a. pedazos  b. paz  c. monedas  d. escopetas

21. Siempre maltratado por los niños, el perro no podía acostumbrarse a _____ de sus nuevos amos.
   a. las caricias  b. los engaños  c. las locuras  d. los golpes

22. ¿Dónde estará mi cartera? La dejé aquí mismo hace poco y parece que el necio de mi hermano ha vuelto a ________.
   a. dejármla  b. deshacérmla  c. escondérmla  d. acabármla

23. Permaneció un gran rato abstraído, los ojos clavados en el fogón y el pensamiento ________.
   a. en el bolsillo  b. en el fuego  c. lleno de alboroto  d. Dios sabe dónde

24. En vez de dirigir el tráfico estabas conversando, así que tú mismo ________ del choque.
   a. sabes la gravedad  b. eres testigo  c. tuviste la culpa  d. conociste a las víctimas

25. Posee esta tierra un clima tan propio para la agricultura como para ________.
   a. la construcción de trampas  b. el fomento de motines  c. el costo de vida  d. la cría de vacas

26. Aficionado leal de obras teatrales, Juan se entristeció al saber ________ del gran actor.
   a. del fallecimiento  b. del éxito  c. de la buena suerte  d. de la alabanza

27. Se reunieron a menudo para efectuar un tratado pero no pudieron ________.
   a. desavenirse  b. echarlo a un lado  c. rechazarlo  d. llevarlo a cabo

28. Se negaron a viajar en barco porque tenían miedo de ________.
   a. los peces  b. los naufragios  c. los faros  d. las playas

29. A la mujer no le gustó el cambio de domicilio pues no le gustaba ________
   a. callejear  b. el puente  c. esa estación  d. aquel barrio

30. Era el único que tenía algo que comer pero se negó a ________.
   a. hojearlo  b. ponérselo  c. conservarlo  d. repartirlo
**Prueba de llenar espacios en blancos**

En esta prueba algunas palabras han sido elididas y remplazadas por números de 1 al 20. Primero, lea el texto completo para que lo pueda entender. Luego, léalo después y escoja la palabra correcta que corresponde de la hoja de respuestas. Marque su respuesta con un círculo en la hoja de respuesta y no llenando el espacio en blanco en el texto.

**Hoy se inaugura muestra fotográfica dedicada a Javier Pérez de Cuéllar**

Mañana se _______(1) en el centro cultural Inca Garcilaso del Ministerio de Relaciones Exteriores una muestra fotográfica ________(2) Javier Pérez de Cuéllar. Se espera que la exposición ______ (3) en honor a su servicio diplomático y su posterior desempeño ______(4) una década como secretario de las Naciones Unidas. Las fotos presentarán etapas ______(5) la vida profesional del destacado peruano. De acuerdo con los organizadores, esta exhibición ______(6) que el público se_______(7) de la manera en que el embajador Pérez de Cuéllar ha ______(8) con sus responsabilidades como diplomático y de los logros ______(9) alcanzó durante más de cuatro décadas de forjada labor.

En el material seleccionado para la ocasión se_______(10), por ejemplo, diversas imágenes del diplomático nacional ______(11) figuras destacadas como la madre Teresa de Calcuta y Juan Pablo II, ______(12) como diferentes líderes internacionales como Nelson Mandela. Es una muestra fiel de la labor pacifista realizada por el diplomático, que luego lo ______(13) en uno de los estadistas más conocidos del mundo.

La muestra recoge material que ______(14) en el archivo fotográfico de las Naciones Unidas y en otros numerosos medios. Cabe señalar que en los ______(15) días el embajador Javier Pérez de Cuéllar ______(16) numerosos homenajes al ______(17) a los 90 años de vida. Por ejemplo, la universidad San Ignacio de Loyola lo ______(18) con otros personajes sobresalientes. Hace pocos días se inauguró la nueva ______(19) de la ONU en el Perú, siendo bautizada con su nombre. En su amplia experiencia profesional se ______(20) como embajador del Perú en Suiza, la desaparecida Unión Soviética, Polonia y Venezuela.

(Adaptado del diario *El comercio*, Enero 22, 2010)
**Hoja de respuestas (parte II)**

<table>
<thead>
<tr>
<th></th>
<th>a. iniciará</th>
<th>b. inició</th>
<th>c. iniciaba</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>a. en</td>
<td>b. sobre</td>
<td>c. acerca</td>
</tr>
<tr>
<td>3</td>
<td>a. sea</td>
<td>b. será</td>
<td>c. es</td>
</tr>
<tr>
<td>4</td>
<td>a. por</td>
<td>b. en</td>
<td>c. con</td>
</tr>
<tr>
<td>5</td>
<td>a. para</td>
<td>b. a</td>
<td>c. de</td>
</tr>
<tr>
<td>6</td>
<td>a. persigue</td>
<td>b. sigue</td>
<td>c. revolucionar</td>
</tr>
<tr>
<td>7</td>
<td>a. enterará</td>
<td>b. entere</td>
<td>c. enteró</td>
</tr>
<tr>
<td>8</td>
<td>a. completado</td>
<td>b. cumplido</td>
<td>c. terminado</td>
</tr>
<tr>
<td>9</td>
<td>a. que</td>
<td>b. el que</td>
<td>c. lo que</td>
</tr>
<tr>
<td>10</td>
<td>a. darán</td>
<td>b. ha enseñado</td>
<td>c. mostrarán</td>
</tr>
<tr>
<td>11</td>
<td>a. en</td>
<td>b. con</td>
<td>c. por</td>
</tr>
<tr>
<td>12</td>
<td>a. ya</td>
<td>b. así</td>
<td>c. para</td>
</tr>
<tr>
<td>13</td>
<td>a. convirtiera</td>
<td>b. haya convertido</td>
<td>c. hubiera convertido</td>
</tr>
<tr>
<td>14</td>
<td>a. habría</td>
<td>b. había</td>
<td>c. hubo</td>
</tr>
<tr>
<td>15</td>
<td>a. últimos</td>
<td>b. pasado</td>
<td>c. anteriores</td>
</tr>
<tr>
<td>16</td>
<td>a. hubiera recibido</td>
<td>b. había encontrado</td>
<td>c. ha recibido</td>
</tr>
<tr>
<td>17</td>
<td>a. haber llegado</td>
<td>b. llega</td>
<td>c. hubo llegado</td>
</tr>
<tr>
<td>18</td>
<td>a. condecoraba</td>
<td>b. condecoró</td>
<td>c. condecoraría</td>
</tr>
<tr>
<td>19</td>
<td>a. sede</td>
<td>b. recinto</td>
<td>c. casa</td>
</tr>
<tr>
<td>20</td>
<td>a. desempeñó</td>
<td>b. hubo desempeñado</td>
<td>c. había desempeñado</td>
</tr>
</tbody>
</table>
Appendix C: Language Experience and Proficiency Questionnaire (LEAP-Q)

Language Experience and Proficiency Questionnaire (LEAP-Q)

<table>
<thead>
<tr>
<th>Last Name</th>
<th>First Name</th>
<th>Today’s Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Please list all the languages you know in order of dominance:
   (Your percentages should add up to 100%)

<table>
<thead>
<tr>
<th>Language here</th>
<th>Percentage here</th>
</tr>
</thead>
</table>

2. Please list all the languages you know in order of acquisition (your native language first):
   (Your percentages should add up to 100%)

<table>
<thead>
<tr>
<th>Language here</th>
<th>Percentage here</th>
</tr>
</thead>
</table>

3. Please list what percentage of the time you are currently and on average exposed to each language.
   (Your percentages should add up to 100%)

<table>
<thead>
<tr>
<th>Language here</th>
<th>Percentage here</th>
</tr>
</thead>
</table>

4. When choosing to read a text available in all your languages, in what percentage of cases would you choose to read it in each of your languages? Assume that the original was written in another language, which is unknown to you.
   (Your percentages should add up to 100%)

<table>
<thead>
<tr>
<th>Language here</th>
<th>Percentage here</th>
</tr>
</thead>
</table>

5. When choosing a language to speak with a person who is equally fluent in all your languages, what percentage of time would you choose to speak each language? Please report percent of total time.
   (Your percentages should add up to 100%)

<table>
<thead>
<tr>
<th>Language here</th>
<th>Percentage here</th>
</tr>
</thead>
</table>

6. Please name the cultures with which you identify. On a scale from zero to ten, please rate the extent to which you identify with each culture. (Examples of possible cultures include US-American, Chinese, Jewish-Orthodox, etc.):

<table>
<thead>
<tr>
<th>Culture here</th>
<th>Percentage here</th>
</tr>
</thead>
</table>

7. How many years of formal education do you have?

   Please check your highest education level (or the approximate US equivalent to a degree obtained in another country):

   - Less than High School
   - High School
   - Professional Training
   - Some College
   - College
   - Some Graduate School
   - Masters
   - Ph.D./M.D./J.D.
   - Other.

Rutgers eIRB
IRB ID: Approval Date: Expiration Date:
**Language**

This is my (please select from pull-down menu) language.

All questions below refer to your knowledge of .

(1) Age when you…:

<table>
<thead>
<tr>
<th>began acquiring</th>
<th>became fluent</th>
<th>began reading</th>
<th>became fluent reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>:</td>
<td>in</td>
<td>in</td>
<td>:</td>
</tr>
</tbody>
</table>

(2) Please list the number of years and months you spent in each language environment:

<table>
<thead>
<tr>
<th></th>
<th>Years</th>
<th>Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>A country where is spoken</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A family where is spoken</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A school and/or working environment where is spoken</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(3) On a scale from zero to ten, please select your level of proficiency in speaking, understanding, and reading from the scroll-down menus:

Speaking (click here for scale) Understanding spoken language (click here for scale) Reading (click here for scale)

(4) On a scale from zero to ten, please select how much the following factors contributed to your learning:

Interacting with friends (click here for pull-down scale) Language tapes/self instruction (click here for pull-down scale)

<table>
<thead>
<tr>
<th></th>
<th>(click here for pull-down scale)</th>
<th>(click here for pull-down scale)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interacting with friends</td>
<td>Language tapes/self instruction</td>
<td>Listening to the radio</td>
</tr>
<tr>
<td>Interacting with family</td>
<td>Watching TV</td>
<td>(click here for pull-down scale)</td>
</tr>
<tr>
<td>Reading</td>
<td>(click here for pull-down scale)</td>
<td>(click here for pull-down scale)</td>
</tr>
</tbody>
</table>

(5) Please rate to what extent you are currently exposed to in the following contexts:

Interacting with friends (click here for pull-down scale) Listening to radio/music (click here for pull-down scale)

<table>
<thead>
<tr>
<th></th>
<th>(click here for pull-down scale)</th>
<th>(click here for pull-down scale)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interacting with friends</td>
<td>Listening to radio/music</td>
<td>(click here for pull-down scale)</td>
</tr>
<tr>
<td>Interacting with family</td>
<td>Reading</td>
<td>(click here for pull-down scale)</td>
</tr>
<tr>
<td>Watching TV</td>
<td>Language-lab/self-instruction</td>
<td>(click here for pull-down scale)</td>
</tr>
</tbody>
</table>

(6) In your perception, how much of a foreign accent do you have in ?

(click here for pull-down scale)

(7) Please rate how frequently others identify you as a non-native speaker based on your accent:

(click here for pull-down scale)
Appendix D: Language Background Questionnaire for Heritage Speakers (LBQHS)

Participant # ______

Instructions:

ALL INFORMATION WILL REMAIN CONFIDENTIAL

Please answer the following questions about your language habits. In some cases, you may be asked to circle your response, while in other cases you may respond with a short answer. If there are questions that do not pertain to you, please leave them blank.

Personal information:

1. Age: ______________________________
2. Gender: ______________________________

Information about the family:

3. Languages spoken by the mother/tutor: ______________________________
   a. Which is the first language they learned? ______________________________
   b. In which language do they feel more confident? ______________________________
   c. What variety of Spanish do they speak? ______________________________
4. Languages spoken by the father/tutor: ______________________________
   a. Which is the first language they learned? ______________________________
   b. In which language do they feel more confident? ______________________________
   c. What variety of Spanish do they speak? ______________________________
5. Languages spoken among the siblings: ______________________________
   a. Which is the first language they learned? ______________________________
   b. In which language do they feel more confident? ______________________________
   c. What variety of Spanish do they speak? ______________________________
6. Languages spoken by the grandparents: ______________________________
   a. Which is the first language they learned? ______________________________
   b. In which language do they feel more confident? ______________________________
   c. What variety of Spanish do they speak? ______________________________

Information about your linguistic competence:

7. Languages spoken or understood. For language(s) that you learned from birth, please write “0” (zero) under “age of acquisition/first exposure”:

<table>
<thead>
<tr>
<th>Language</th>
<th>Age of acquisition/first exposure</th>
<th>Any formal education in it?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Language 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Language 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Language 3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
8. Language proficiency. Rate the following based on a 0-10 scale, where (0= not at all, 10= excellent).
   a. Rate your ability to speak in these different situations:

<table>
<thead>
<tr>
<th></th>
<th>Spanish</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conversing with friends</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Talking on the phone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>At work</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Making a formal complaint</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   b. Rate your ability to understand someone else speaking in these situations:

<table>
<thead>
<tr>
<th></th>
<th>Spanish</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>At work</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Movies/TV without subtitles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conversations with friends</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In a store/bank/restaurant</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   c. Rate your ability to write the following:

<table>
<thead>
<tr>
<th></th>
<th>Spanish</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Letter/e-mail to friends/family</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Letter/e-mail to a boss, a complaint</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paper/project summary/composition</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   d. Rate your understanding of these written materials:

<table>
<thead>
<tr>
<th></th>
<th>Spanish</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newspapers/magazines/Internet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Books/textbooks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Letters/e-mail</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Language choice:**

Mark the percentage of language of for Spanish and English in each of these contexts:

<table>
<thead>
<tr>
<th>Preferred language</th>
<th>Spanish</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>With your parents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>With your siblings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>With your partner</td>
<td></td>
<td></td>
</tr>
<tr>
<td>At work</td>
<td></td>
<td></td>
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<tr>
<td>At school/university</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Watching TV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>At shops/banks</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix E: Elicited Production Task (EPT)


1a. La mamá pensaba que María necesitaba beber agua con las comidas. ¿Qué le dijo la mamá a María? ¡María, un vaso de agua con las comidas! (tomar)

1b. El chico pensaba que la radio de Felipe no se escuchaba muy fuerte. ¿Qué le dijo el chico a Felipe? ¡Felipe, el volumen de la radio! (subir)

1c. La profesora vio que Marta no estaba prestando atención a la película. ¿Qué le dijo la profesora a Marta? ¡Marta, la película! (mirar)

1d. La chica no podía estudiar porque la música de su amiga estaba muy fuerte. ¿Qué le dijo la chica a su amiga? ¡Laura, la música! (parar)

1e. La mamá piensa que Antonio necesita tomar bastante calcio. ¿Qué le dijo la mamá a Antonio? ¡Antonio, un vaso de leche todas las mañanas! (beber)

1f. La mamá piensa que Juanito ya puede prepararse la merienda solo. ¿Qué le dijo la mamá a Juanito? ¡Juanito, las bananas con leche! (batir)

1g. El papá piensa que Carlos ya puede arreglarse la ropa rota. ¿Qué le dijo el papá a Carlos? ¡Carlos, el pantalón roto! (coser)

1h. La chica quería que su amiga probara su salsa de tomate. ¿Qué le dijo la chica a su amiga? ¡Sandra, el pan en la salsa! (mojar)

2. Condition 2: Singular addressee in negative imperative eliciting production of surrogate verb morphology in imperatives.

2a. El dermatólogo pensó que era mala idea tomar mucho el sol.
¿Qué le dijo el dermatólogo a María?
¡María, el sol! (no tomar)

2b. El chico pensaba que ya no hacía frío en el apartamento.
¿Qué le dijo el chico a Antonio?
¡Antonio, la calefacción! (no subir)

2c. El profesor vio que Marta quería copiarse de su compañero durante el examen.
¿Qué le dijo el profesor a Marta?
¡Marta, el examen de tu compañero! (no mirar)

2d. El chico no quería que la fiesta de Laura acabara temprano.
¿Qué le dijo el chico a Laura?
¡Laura, la fiesta! (no parar)

2e. El doctor insiste que la soda no es buena para la salud de Carlos.
¿Qué le dijo el doctor a Carlos?
¡Carlos, soda! (no beber)

2f. La mamá estaba ensenándole a Juanito como preparar ensalada de papas.
¿Qué le dijo la mamá a Juanito?
¡Juanito, las papas! (no batir)

2g. La abuela estaba ensenándole a Sandra como arreglar la ropa estropeada.
¿Qué le dijo la abuela a Sandra?
¡Sandra, ropa pesada con una aguja pequeña! (no coser)

2h. La mamá se enojó al ver a David volver de la piscina sin secarse.
¿Qué le dijo la mamá a David?
¡David, el piso! (no mojar)


3a. La doctora necesitaba a dos enfermeros para evaluar a la paciente.
¿Qué les dijo la doctora a los enfermeros?
¡Jóvenes, la temperatura de la paciente! (tomar)

3b. El jefe necesitaba tres empleados para mover una mesa al segundo piso.
¿Qué les dijo el jefe a los empleados?
¡Jóvenes, la mesa al segundo piso! (subir)

3c. El director de cine les da recomendaciones a sus mejores amigos.
¿Qué les dijo el director de cine a sus amigos?
¡Amigos, la nueva película de terror! (mirar)
3d. El papá se enojó porque los niños no hicieron la tarea.  
¿Qué les dijo el papá a los niños?  
¡Niños, el juego! (parar)

3e. La estudiante les cuenta a sus amigas cómo perder peso.  
¿Qué les dijo la estudiante a sus amigas?  
¡Amigas, té verde! (beber)

3f. El chef necesitaba dos cocineros para preparar la masa del pastel.  
¿Qué les dijo el chef a los cocineros?  
¡Jóvenes, los ingredientes del pastel! (batir)

3g. La dueña del taller de costura presionó a sus empleados.  
¿Qué les dijo la dueña a sus empleadas?  
¡Muchachas, la ropa más rápido! (coser)

3h. El dueño del taller de lavado de carros les explicó el protocolo a los nuevos empleados.  
¿Qué les dijo el dueño a los empleados?  
¡Muchachos, el carro antes de poner el jabón! (mojar)


4a. Felipe te dice: Tengo un estudiante muy desobediente en mi clase.  
¿Qué le sugieres?  
¡Felipe, ! (echar)

4b. Marta te dice: El villano de este videojuego no me permite avanzar.  
¿Qué le sugieres?  
¡Marta, ! (matar)

4c. Felipe te dice: Quiero volver a ver a mi amigo, pero me ignora.  
¿Qué le sugieres?  
¡Felipe, ! (dejar)

4d. Felipe te dice: Mi amigo se ha enojado conmigo y no sé qué hacer.  
¿Qué le sugieres?  
¡Felipe, ! (llamar)

4e. Felipe te dice: ¡Mi hermano se ha perdido y estoy desesperado!  
¿Qué le sugieres?  
¡Felipe, ! (buscar)

4f. Felipe te dice: Mi hermano tiene problemas y necesita ayuda.  
¿Qué le sugieres?
¡Felipe, ! (ayudar)

5. Condition 5: Singular addressee in negative imperative with clitic eliciting production of clitic in negative imperatives.

5a. Felipe te dice: En mi empresa tengo un trabajador mediocre, pero acaba de tener un bebé.
¿Qué le sugieres?
¡Felipe, ! (no echar)

5b. Felipe te dice: ¡Qué extraño! El villano de este videojuego me intenta ayudar.
¿Qué le sugieres?
¡Felipe, ! (no matar)

5c. Marta te dice: Fernando y yo tenemos algunos problemas, pero nos queremos. ¡No sé qué hacer!
¿Qué le sugieres?
¡Marta, ! (no dejar)

5d. Marta te dice: Quiero hablar con mi amigo, pero él dice que soy una pesada...
¿Qué le sugieres?
¡Marta, ! (no llamar)

5e. Felipe te dice: Quiero reunirme con mi amigo, pero tiene la gripe...
¿Qué le sugieres?
¡Felipe, ! (no buscar)

5f. Marta te dice: Mi amigo me ha pedido dinero de nuevo.
¿Qué le sugieres?
¡Marta, ! (no ayudar)
Appendix F: Acceptability Judgment Task (AJT) (Version 1 and 2)

All test items used the Likert scale below:

1. Condition 1: Singular addressee in canonical imperative testing receptive grammatical knowledge of second person singular verb morphology in imperatives.

1a. La mamá pensaba que María necesitaba beber agua con las comidas. ¿Qué le dijo la mamá a María?
   Version 1: ¡María, toma un vaso de agua con las comidas!
   Version 2: ¡María, tomes un vaso de agua con las comidas!

1b. El chico pensaba que la radio de Felipe no se escuchaba muy fuerte. ¿Qué le dijo el chico a Felipe?
   Version 1: ¡Felipe, subas el volumen de la radio!
   Version 2: ¡Felipe, sube el volumen de la radio!

1c. La profesora vio que Marta no estaba prestando atención a la película. ¿Qué le dijo la profesora a Marta?
   Version 1: ¡Marta, mira la película!
   Version 2: ¡Marta, mires la película!

1d. La chica no podía estudiar porque la música de su amiga estaba muy fuerte. ¿Qué le dijo la chica a su amiga?
   Version 1: ¡Laura, pares la música!
   Version 2: ¡Laura, para la música!

1e. La mamá piensa que Antonio necesita tomar bastante calcio. ¿Qué le dijo la mamá a Antonio?
   Version 1: ¡Antonio, bebe un vaso de leche todas las mañanas!
   Version 2: ¡Antonio, bebas un vaso de leche todas las mañanas!

1f. La mamá piensa que Juanito ya puede prepararse la merienda solo. ¿Qué le dijo la mamá a Juanito?
   Version 1: ¡Juanito, batas las bananas con leche!
   Version 2: ¡Juanito, bate las bananas con leche!

1g. El papá piensa que Carlos ya puede arreglarse la ropa rota. ¿Qué le dijo el papá a Carlos?
   Version 1: ¡Carlos, cose el pantalón roto!
   Version 2: ¡Carlos, cosas el pantalón roto!

1h. La chica quería que su amiga probara su salsa de tomate. ¿Qué le dijo la chica a su amiga?
   Version 1: ¡Sandra, mojes el pan en la salsa!
   Version 2: ¡Sandra, moja el pan en la salsa!
2. Condition 2: Singular addressee in negative imperative testing receptive grammatical knowledge of surrogate verb morphology in imperatives.

2a. El dermatólogo pensó que era mala idea tomar mucho el sol.
¿Qué le dijo el dermatólogo a María?
Version 1: ¡María, no tomes el sol!
Version 2: ¡María, no toma el sol!

2b. El chico pensaba que ya no hacía frío en el apartamento.
¿Qué le dijo el chico a Antonio?
Version 1: ¡Antonio, no sube la calefacción!
Version 2: ¡Antonio, no subas la calefacción!

2c. El profesor vio que Marta quería copiarse de su compañero durante el examen.
¿Qué le dijo el profesor a Marta?
Version 1: ¡Marta, no mires el examen de tu compañero!
Version 2: ¡Marta, no mira el examen de tu compañero!

2d. El chico no quería que la fiesta de Laura acabara temprano.
¿Qué le dijo el chico a Laura?
Version 1: ¡Laura, no para la fiesta!
Version 2: ¡Laura, no pares la fiesta!

2e. El doctor insiste que la soda no es buena para la salud de Carlos.
¿Qué le dijo el doctor a Carlos?
Version 1: ¡Carlos, no bebas soda!
Version 2: ¡Carlos, no bebe soda!

2f. La mamá estaba ensenándole a Juanito cómo preparar ensalada de papas.
¿Qué le dijo la mamá a Juanito?
Version 1: ¡Juanito, no bate las papas!
Version 2: ¡Juanito, no batas las papas!

2g. La abuela estaba ensenándole a Sandra cómo arreglar la ropa estropeada.
¿Qué le dijo la abuela a Sandra?
Version 1: ¡Sandra, no cosas ropa pesada con una aguja pequeña!
Version 2: ¡Sandra, no cose ropa pesada con una aguja pequeña!

2h. La mamá se enojó al ver a David volver de la piscina sin secarse.
¿Qué le dijo la mamá a David?
Version 1: ¡David, no moja el piso!
Version 2: ¡David, no mojes el piso!

3. Condition 3: Plural addressee in canonical imperative testing receptive grammatical knowledge of second person plural verb morphology in imperatives.
3a. La doctora necesitaba a dos enfermeros para evaluar a la paciente. ¿Qué les dijo la doctora a los enfermeros?
Version 1: ¡Jóvenes, tomen la temperatura de la paciente!
Version 2: ¡Jóvenes, toma la temperatura de la paciente!

3b. El jefe necesitaba tres empleados para mover una mesa al segundo piso. ¿Qué les dijo el jefe a los empleados?
Version 1: ¡Jóvenes, sube la mesa al segundo piso!
Version 2: ¡Jóvenes, suban la mesa al segundo piso!

3c. El director de cine les da recomendaciones a sus mejores amigos. ¿Qué les dijo el director de cine a sus amigos?
Version 1: ¡Amigos, miren la nueva película de terror!
Version 2: ¡Amigos, mira la nueva película de terror!

3d. El papá se enojó porque los niños no hicieron la tarea. ¿Qué les dijo el papá a los niños?
Version 1: ¡Niños, para el juego!
Version 2: ¡Niños, paren el juego!

3e. La estudiante les cuenta a sus amigas cómo perder peso. ¿Qué les dijo la estudiante a sus amigas?
Version 1: ¡Amigas, beban té verde!
Version 2: ¡Amigas, bebe té verde!

3f. El chef necesitaba dos cocineros para preparar la masa del pastel. ¿Qué les dijo el chef a los cocineros?
Version 1: ¡Jóvenes, bate los ingredientes del pastel!
Version 2: ¡Jóvenes, batan los ingredientes del pastel!

3g. La dueña del taller de costura presionó a sus empleados. ¿Qué les dijo la dueña a sus empleadas?
Version 1: ¡Muchachas, cosan la ropa más rápido!
Version 2: ¡Muchachas, cose la ropa más rápido!

3h. El dueño del taller de lavado de carros les explicó el protocolo a los nuevos empleados. ¿Qué les dijo el dueño a los empleados?
Version 1: ¡Muchachos, moja el carro antes de poner el jabón!
Version 2: ¡Muchachos, mojen el carro antes de poner el jabón!

4. Condition 4: Singular addressee in canonical imperative with clitic testing receptive grammatical knowledge of clitic placement in affirmative imperatives.

4a. Felipe te dice: Tengo un estudiante muy desobediente en mi clase.
¿Qué le sugieres?
Version 1: ¡Felipe, échalo!
Version 2: ¡Felipe, lo echa!

4b. Marta te dice: El villano de este videojuego no me permite avanzar.
¿Qué le sugieres?
Version 1: ¡Marta, mátalo!
Version 2: ¡Marta, lo mata!

4c. Felipe te dice: Quiero volver a ver a mi amigo, pero me ignora.
¿Qué le sugieres?
Version 1: ¡Felipe, déjalo!
Version 2: ¡Felipe, lo deja!

4d. Felipe te dice: Mi amigo se ha enojado conmigo y no sé qué hacer.
¿Qué le sugieres?
Version 1: ¡Felipe, lo llama!
Version 2: ¡Felipe, llámalo!

4e. Felipe te dice: ¡Mi hermano se ha perdido y estoy desesperado!
¿Qué le sugieres?
Version 1: ¡Felipe, lo busca!
Version 2: ¡Felipe, búsca lo!

4f. Felipe te dice: Mi hermano tiene problemas y necesita ayuda.
¿Qué le sugieres?
Version 1: ¡Felipe, lo ayuda!
Version 2: ¡Felipe, ayúdalo!

5. Condition 5: Singular addressee in negative imperative with clitic testing receptive grammatical knowledge of clitic placement in negative imperatives.

5a. Felipe te dice: En mi empresa tengo un trabajador mediocre, pero acaba de tener un bebé.
¿Qué le sugieres?
Version 1: ¡Felipe, no échalo!
Version 2: ¡Felipe, no lo eches!

5b. Felipe te dice: ¡Qué extraño! El villano de este videojuego me intenta ayudar.
¿Qué le sugieres?
Version 1: ¡Felipe, no mátalo!
Version 2: ¡Felipe, no lo mates!

5c. Marta te dice: Fernando y yo tenemos algunos problemas, pero nos queremos. ¡No sé qué hacer!
¿Qué le sugieres?
Version 1: ¡Marta, no déjalo!
Version 2: ¡Marta, no lo dejes!

5d. Marta te dice: Quiero hablar con mi amigo, pero él dice que soy una pesada...
¿Qué le sugieres?
Version 1: ¡Marta, no lo llames!
Version 2: ¡Marta, no llámalo!

5e. Felipe te dice: Quiero reunirme con mi amigo, pero tiene la gripe...
¿Qué le sugieres?
Version 1: ¡Felipe, no lo busques!
Version 2: ¡Felipe, no búscalo!

5f. Marta te dice: Mi amigo me ha pedido dinero de nuevo.
¿Qué le sugieres?
Version 1: ¡Marta, no lo ayudes!
Version 2: ¡Marta, no ayúdalo!
Appendix G: Lexical Frequency Self-Rating Task (LFSRT)

1) Lexical Frequency Self-Reported Test: exposure.

Using the scale below, how frequently do you hear the following words?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
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</thead>
<tbody>
<tr>
<td>Never</td>
<td>Hardly ever</td>
<td>A few times a year</td>
<td>Once a month</td>
<td>A few times a month</td>
<td>Once a week</td>
<td>Several times a week</td>
<td>Once a day</td>
<td>Several times a day</td>
<td></td>
</tr>
</tbody>
</table>

1. Tomar

2. Subir

3. Mirar

4. Parar

5. Beber

6. Batir

7. Coser

8. Mojar
<table>
<thead>
<tr>
<th>9. Echar</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<tbody>
<tr>
<td>Never</td>
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<tr>
<td>A few times a year</td>
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<td>Once a month</td>
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<tr>
<td>A few times a month</td>
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<td>Once a week</td>
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<tr>
<td>Several times a week</td>
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<tr>
<td>Once a day</td>
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<td>Several times a day</td>
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<table>
<thead>
<tr>
<th>10. Matar</th>
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<th>3</th>
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<th>5</th>
<th>6</th>
<th>7</th>
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<tbody>
<tr>
<td>Never</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Hardly ever</td>
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<td></td>
<td></td>
</tr>
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2) Lexical Frequency Self-Reported Test: production.

Using the scale below, how frequently do you **use** the following words?

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3. Mirar

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6. Batir

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<td>Hardly ever</td>
<td>A few times a year</td>
<td>Once a month</td>
<td>A few times a month</td>
<td>Once a week</td>
<td>Several times a week</td>
<td>Once a day</td>
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</tbody>
</table>

27. Gritar

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28. Llorar

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29. Nadar

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30. Trabajar

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</tr>
</tbody>
</table>
3) Lexical Frequency Self-Reported Test: translation.

Provide an English translation/equivalent for the following words:

1. Tomar:
2. Subir:
3. Mirar:
4. Parar:
5. Beber:
6. Batir:
7. Coser:
8. Mojar:
9. Echar:
10. Matar:
11. Dejar:
12. Llamar:
13. Buscar:
14. Ayudar:
15. Desaparecer:
16. Entrar:
17. Escapar:
18. Llegar:
19. Nacer:
20. Salir:
21. Venir:

22. Crecer:

23. Bailar:

24. Cantar:

25. Dormir:

26. Estornudar:

27. Gritar:

28. Llorar:

29. Nadar:

30. Trabajar: