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Los Angeles

On the Acquisition of Periphrastic and *Se*-Passives
in L2 and Heritage Spanish

A dissertation submitted in partial satisfaction of the
requirements for the degree Doctor of Philosophy
in Hispanic Languages and Literatures

by

Erin Mauffray

2024

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ABSTRACT OF THE DISSERTATION

On the Acquisition and Maintenance of Periphrastic and *Se*-Passives
in L2 and Heritage Spanish

by

Erin Mauffray

Doctor of Philosophy in Hispanic Languages and Literatures

University of California, Los Angeles, 2024

Professor Victoria Eugenia Mateu Martin, Chair

This study investigates the acquisition and maintenance of periphrastic and *se*-passives in second language (L2), heritage (HS), and (Spanish-dominant) native Spanish speakers (NS) by addressing: (i) How accessible are Spanish periphrastic passives (which also exist in English) and *se*-passives (unique to Spanish) for L2ers and HSs in production? (ii) Do their productions reflect fully acquired, target-like grammatical representations of these structures? (iii) How are L2ers' and HSs' productive and receptive performance on passives affected by linguistic experience, i.e., age of acquisition, nature of language exposure, and proficiency? While some theoretical accounts predict an advantage for HSs due to exposure to the target structures during childhood (e.g., Partial Access, Interpretability Hypothesis, Hawkins & Franceschina, 2004; Byland, 2009), others predict

successful ultimate attainment by both groups albeit with initial difficulties with the *se*-passive for L2ers (e.g., Full Access, Schwartz & Sprouse, 1996). Contrastively, usage-based accounts (e.g., Ellis, 1994, Hur et al., 2020; López-Beltrán & Carlson, 2020; O'Grady et al., 2011; Perez-Cortés & Giancaspro, 2022, a.o.) predict an advantage for the more frequent *se*-passive across groups.

The study consists of two web-based tasks: a structural priming (production) task and a timed acceptability judgment (receptive) task (AJT). Results from the priming task show that all groups can be primed to produce both passives. However, results from the AJT show that L2ers accept mismatched verbal agreement with *se*-passives to some extent, but not with periphrastic passives, consistent with the Partial Access accounts. In other words, their native-like behavior in production likely reflects a superficial, probability-based strategy, not a fully represented, target-like abstract structural representation. On the other hand, HSs perform at ceiling on both structures and converge with NSs in production and receptive abilities, suggesting robust knowledge of these structures. This dissertation constitutes the first experimental study to test both passive constructions in production and comprehension in any of these three speaker groups, offering insight into the particular abilities and pedagogical needs of L2ers and HSs and contributing to the discussion of how language is organized in the bilingual brain.

The dissertation of Erin Mauffray is approved.

Jesse Aron Harris

Ji Young Kim

Antonio C. Quicoli

Victoria Eugenia Mateu Martin, Committee Chair

University of California, Los Angeles

2024

This dissertation is dedicated to the Murrah High School community, and especially to my students, the softball team, and Mustang Debate team 2015-2019.

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VITA

- 2007-2012 B.A. International Studies and Spanish, University of Mississippi
- 2012-2013 AmeriCorps VISTA at the Office of the Provost, University of Mississippi
- 2013-2015 M.A. Spanish Linguistics, University of Georgia
- 2015-2019 Spanish Teacher, Murrah High School, Jackson, MS
- 2020-2023 Teaching Assistant at the Spanish and Portuguese Department, UCLA
- 2023-2024 Dissertation Year Fellowship, University of California, Los Angeles

PUBLICATIONS

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CHAPTER 1: INTRODUCTION

1.1. Overview and Significance

This dissertation investigates the nature of interlanguage and end-state grammars in second language and heritage Spanish speakers. Its main goals are to elucidate the process of acquiring second language (L2) grammatical knowledge, and maintaining it in the case of heritage languages (HLs), as well as how this knowledge is manifested in their productions and in their acceptability judgments. Thus, this dissertation is about the relationship between non-dominant grammar representation and non-dominant language production. Ultimately, we want to discover whether L2 and HL grammatical knowledge differ from one another and from L1-dominant native speaker grammatical knowledge and production. If differences (or similarities) are found, the questions are whether those are deeply rooted in their grammars, i.e., representational, or not, i.e., performance-related, and what this can tell us about age of acquisition effects and the potential for transfer in bilingual systems.

Specifically, we focus on Spanish passives acquired by English native speakers who are learning Spanish as a non-native language (L2ers) and by Spanish heritage speakers whose dominant language is English (HSs). Spanish has two passive constructions: the periphrastic passive and the *se*-passive. Both involve movement of the deep object to subject position, but they differ in two crucial respects: (i) the periphrastic passive, but not the *se*-passive, has an analogous counterpart in English, and (ii) although both are rather uncommon in Spanish compared to English (as discussed below), the *se*-passive is significantly more frequent than the periphrastic passive in Spanish. Even so, the periphrastic passive is still available in adult, native Spanish speakers. This mismatch of available passive options between English and Spanish makes passive forms an interesting target of acquisitional studies with Spanish-English bilingual speakers, given

the possibility of positive transfer with the periphrastic passive on the one hand, and the lack of transferability and/or possibility of English mapping of the *se*-passive on the other. Further, the difference in frequency between these two structures with similar pragmatic functions offers the possibility of assessing frequency effects in the acquisition, use, and mastery of complex syntactic forms.

In addition to assessing the roles of age of acquisition, transfer, and frequency, we also explore language dominance (English- versus Spanish-dominant), lexical proficiency, and reading habits in the acquisition and maintenance of these two complex structures. This study contributes to the current theories on Second Language Acquisition (SLA) and Heritage Language Acquisition (HLA) by making available new experimental data that provide a more complete description of the relationship between grammatical and production systems in these populations. It is unique in that it compares (i) both Spanish passives structures, (ii) in both productive and receptive tasks, (iii) presented in the aural and written modes simultaneously, (iv) in both L2 and HL speakers who share the same dominant (English) and non-dominant (Spanish) languages, with native speakers whose dominant language is the target language.

This dissertation is organized as follows: in Chapter 1, we give an overview of our speaker groups of interest, including previous studies and theoretical motivations. In Chapter 2, we discuss the experimental design and the participant profiles and results for the L2 speakers in our study. Chapter 3 discusses the same study with the HS group. In Chapter 4, we finish with a summary and a discussion of implications and future directions.

Within this chapter, in Section 1.2, we introduce our speaker groups of interest and summarize and comment on several theoretical models of second language acquisition (SLA). In Section 1.3, we describe patterns of heritage language acquisition (HLA). Next, we describe our

structures of interest in Section 1.4, followed by a discussion of previous work on the acquisition of passives in child L1, heritage, and adult L2 speakers in Section 1.5. In Section 1.6, we discuss the structural priming paradigm along with some relevant previous findings in priming studies. The section concludes with an overview of the research questions and predictions in Section 1.7.

1.2. Linguistic Theory

1.2.1. Theoretical Framework: Generative Approaches to Language Acquisition

How children acquire language – a highly sophisticated computational system – in a relatively short amount of time is one of the challenges that any linguistic or cognitive theory must answer. Children are able to produce complex sentences that they have never heard before, and they do so before achieving other basic milestones of cognitive development, such as understanding numerosity and tying their shoes. This question becomes even more challenging to answer when we take into account the Poverty of the Stimulus problem – children's input is uneven, inconsistent, and significantly underrepresents the knowledge they ultimately attain, and yet this knowledge of what is possible, *and* more puzzling, what is impossible in their grammar is acquired by all typically-developing learners despite the improbability of extracting such rich, complex knowledge from the input (Chomsky, 1980). Most crucially, they do so without explicit instruction on the one hand and without negative evidence of what is not grammatical on the other, even with structures that are highly *infrequent* in the input (e.g., passives, see Berman & Slobin, 1994). The argument made by generativists is that the acquisition process is streamlined by domain-specific linguistic knowledge with which (neurotypical) children are hypothesized to be born, i.e., Universal Grammar (e.g., Chomsky, 1965; Pinker, 1995, et seq.). Universal Grammar refers to innate sets of principles and features present in human languages that are associated with different lexical items in each language and that must be acquired based on the linguistic input

learners receive. In other words, children are not born with a blank slate for language but rather a blueprint ready to be specified. This innate capacity, which understands Language as a complex hierarchical system, thus helps explain the above question, which has been termed the Logical Problem of Language Acquisition (Hornstein & Lightfoot, 1981).

Usage-based approaches (Ellis, 2002; Tomasello, 2003; MacWhinney, 2005, a.o.), in contrast, postulate that language acquisition occurs as a result of our general cognitive abilities, i.e., along with other developmental skills, and language learners use input frequency and probabilistic-based learning to create new language: they apply analogous structures heard in their input to create new sentences. Language under usage-based accounts is generally assumed to be mostly superficial or linear, while proponents of UG argue it is made of deep hierarchical structures and formal principles to which humans have access by nature of being human. Importantly, proponents of UG do not deny the role of frequency – for example, Yang (2002) proposes an algorithmic model of language learning which (convincingly) suggests that humans use language input and probability to distinguish between possible grammars specified by UG.

The ultimate goal of generative linguists is to reveal the cognitive and representational mechanisms that human beings employ when using a language; that is, they attempt to characterize speakers' competence and their implicit knowledge of language, even though the description of (interlanguage) grammars is inexorably based on language performance, i.e., how speakers actually use language in real time, which may be altered by extra-grammatical factors, such as working memory limitations, task effects, social factors, individual aspects, or physical states.

In what follows, we discuss the speaker groups of interest in the present study along with a brief description of the linguistic profiles of these speakers, which we return to in Section 1.2.4 and Section 1.3.

1.2.2. Speaker Groups of Interest

In this project, we consider three adult speaker groups: (1) L2 Spanish speakers (L2ers) who learned Spanish in a classroom setting, were not regularly exposed to Spanish language before puberty, and whose first language is English; (2) Heritage speakers (HSs) of Spanish, a particular subset of native speakers sometimes described as early or simultaneous bilinguals – in our study, individuals who grew up in a region where English is the dominant language but in a home where Spanish is spoken (Wiley & Valdés, 2000); and (3) Spanish-dominant L1 Spanish speakers (NSs) who grew up in a Spanish dominant home and region.¹

The age of acquisition and nature of exposure for these adult speaker groups vary. HSs learn primarily through spoken language in a similar way to (non-heritage) NSs until school age (5-6) when they experience a dominance shift as they attend English-dominant schools. Typical L2ers learn in a classroom setting and tend to be exposed to more written Spanish than naturalistic spoken Spanish. Given these differences, L2ers tend to demonstrate strong metalinguistic abilities and excel in the written mode while HSs demonstrate communicative competence and excel in the aural/oral modes (e.g., Sánchez-Walker & Montrul, 2021; Montrul, 2016; Montrul, Davidson, et al., 2014; a.o.).

1.2.3. Generative Approaches to Second Language Acquisition

Along with the debates between generative and usage-based accounts of language acquisition, another question arises: Is there a Critical Period (Lenneberg, 1967) of language acquisition, after which acquiring a language in a ‘native-like’ way is not guaranteed? The theory of the Critical Period has been proposed for first language acquisition to account for cases in which

¹ We refer to this group as simply ‘native speakers’ or ‘NSs’ but want to emphasize here that we do not wish to suggest that heritage speakers are not also native speakers of Spanish. We also note that sometimes this group is referred to as “monolingually-raised” native speakers, but we will not use that terminology due to the improbability of speakers being completely “monolingually-raised”.

grammar was ultimately never acquired, such as Genie (age of linguistic reimmersion: 13; Curtiss, 1977), in comparison to cases in which it was, such as Isabelle (age of linguistic reimmersion: 6; Davis, 1947) – these cases strongly suggest that after puberty the acquisition of grammar appears impossible. The Critical Period hypothesis (also known as Sensitive Period hypothesis) has also been proposed for second language acquisition: from birth to puberty, neurotypical speakers are able to acquire a language fully, but after this period, the possibility of acquiring a language *fully* significantly diminishes (Johnson & Newport, 1989; Granena & Long, 2012; Hartshorne, et al., 2018, a.o.). The question that generative linguists ask is thus: Do adult L2 language learners have (any) access to mechanisms implemented in first language acquisition, i.e., Universal Grammar, or do they use domain-general cognitive mechanisms to learn an L2, maintaining shallow structures and analyses of their L2?

1.2.3.1. Full Access. Full Access accounts postulate that L2ers do have full access to Universal Grammar, even after the Critical or Sensitive Period, though the nature of this access varies by account. The *Full Transfer/Full Access* account suggests that the initial state of the L2 is constrained by the parameters of the L1: L2 features are mapped onto L1 abstract representations, which predicts an advantage for structures that exist in both languages in early stages of learning (Schwartz & Sprouse, 1996). This is supported by numerous studies that demonstrate that the L1 influences the L2 (e.g., Odlin, 1989; Schwartz & Sprouse, 1996; Goad & White, 2006; Lardiere, 2005; Shimanskaya, 2015, a.o.). Importantly, under this account, more advanced L2ers will eventually be able to acquire features and structures present in the L2 and not attested in the L1, even if they are not explicitly taught in the classroom, suggesting access to Universal Grammar. Another Full Access account is the *Feature Reassembly Hypothesis* (Lardiere, 2009). Under this account, formal features such as case, person, gender, and number are

considered to be the building blocks of grammatical representations. Semantic features such as definiteness, animacy, agentivity, past, and perfective are also proposed to be represented in functional categories. All these features in various combinations are expressed on lexical items such as verbs and nouns, and reflected in functional categories on a linguistic tree structure. This hypothesis theorizes that the task of the L2 learner is to detect, select, and (re)assemble appropriate morphological and/or semantic features associated with different lexical items in the L2. For example, in English, [ANIMACY] is a feature that is encoded in its pronoun inventory, he/she vs. it, and who vs. which. In Spanish, this feature is part of the *a-personal*, a differential object marking that appears before animate direct object determiner phrases (DPs), but not before inanimate direct object DPs. An English L1 - Spanish L2 speaker would need to create this connection between a new lexical item, Spanish *a*, and a familiar feature, [ANIMACY]. The task becomes more difficult – although crucially, not impossible – when the feature is not instantiated in the L1 or when a large number of features must be (re)assembled together. For example, Lardiere (2007, 2008) conducted a longitudinal study on a native Chinese speaker learning L2 English, investigating their acquisition of plural marking in English, given that number-marking in Chinese is not obligatory, nor does it co-occur with non-human, quantified, and indefinite nouns. They found that the speaker did seem to have reassembled plural marking features to the English paradigm, though their performance varied and was not consistent, suggesting some difficulties with this reassembly of functional features.

1.2.3.2. Partial Access. Other accounts predict partial access to Universal Grammar by L2ers. The *Representational Deficit Hypothesis* suggests that while UG principles are accessible to L2ers, functional categories and feature values not instantiated in the L1 are not (Hawkins & Chan, 1997; Hawkins et al., 2004). This account predicts that while L2ers may achieve production

and competence that suggest a native-like underlying representation, they may actually be using domain-general cognitive learning mechanisms like analogy. The *Interpretability Hypothesis*, built on the previous hypothesis, similarly predicts that only interpretable features can be fully acquired after the Sensitive or Critical Period (e.g., number on nouns), even if not present in their L1, while uninterpretable features (e.g., gender on adjectives) not instantiated in the L1 cannot be implicitly acquired by adult L2ers (Tsimpli & Mastropavlou, 2007).

Support for these accounts comes from studies such as Tsimpli and Dimitrakopoulou (2007), who found that both intermediate and advanced L2 learners of English transfer patterns of uninterpretable features from their L1 Greek to their L2 English, overaccepting resumptive pronouns, which are disallowed in English but licit in Greek. That these issues remained even in the advanced group supports the notion that uninterpretable features are not eventually acquired even in endstate grammars for L2ers that begin learning after the Sensitive Period.

1.2.3.3. No Access. Still, some accounts postulate that L2ers no longer have access to Universal Grammar mechanisms after the critical period. The *Fundamental Differences Hypothesis* posits that adult L2ers will only be able to acquire fully those principles and functional categories that are present in the L1 (Bley-Vroman, 1990). Any native-like patterns are believed to be learned through domain-general strategies that do not reflect deep, abstract representations in the grammars of adult L2ers.

1.2.3.4. Other Relevant Accounts. Some postulate that L2 acquisition and processing is fundamentally different from L1 acquisition and processing (e.g., Meisel, 1997; see also Beck, 1998; Tsimpli & Roussou, 1991; Liceras et al., 1998, a.o.). For example, the *Shallow Structure Hypothesis* suggests that L2ers do not tap into abstract syntactic representations in L2 processing and production, either because the structure has not been acquired or because the speakers make

more use of other sources of information, e.g., semantic or pragmatic information (Clahsen & Felser, 2006, 2018). Under the *SSH*, L2 processing differs from L1 processing: while L1 processing is hierarchical in nature, L2 processing is often assumed to be more linear, making certain hierarchical syntactic relationships in the L2 difficult for L2ers to process, e.g., long distance dependencies which require accessing previously built representations (Felser, 2015).

Another current account, *The Interface Hypothesis* (Sorace & Filiaci, 2006) makes a distinction between knowledge which lies squarely in one domain (e.g., narrow syntax) and knowledge learned at the interfaces of linguistic domains (e.g., the syntax-discourse interface). This hypothesis suggests that principles which lie at the interfaces of domains will be difficult or even impossible for L2ers to acquire and will also be more difficult to maintain in the case of heritage grammars. For example, in Spanish, word order differences conditioned by semantic (Gondra, 2022) or discursive (Lozano, 2006) factors, lying at the syntax-semantics and syntax-discourse interfaces, respectively, appear to be more challenging for both heritage speakers and L2ers, though results vary (e.g., Slabakova, 2012).

1.2.3.5. Usage-based Accounts. Usage-based accounts of language acquisition (Ellis, 2002, et. seq.), as mentioned, suggest that learners rely on general cognitive processes (e.g., problem-solving, probability, analogy) to acquire language directly from the input. These accounts predict that frequency will be one of the most, if not the most, important factor in successful language acquisition: those structures or principles that are more frequent in the input will be the structures that learners acquire most successfully. Cases in which L2ers successfully acquire native-like knowledge of a structure despite lack of input or explicit instruction challenge these accounts (see a special issue of *The Linguistic Review*, 2002, volumes 1 and 2 entitled “A review

of the poverty of the stimulus argument” for a collection of articles that address the debate inherent to this topic).

1.2.4. Interim Summary

In order to determine whether adult L2 learners can achieve native-like competence of grammatical forms that are not present in the dominant language, we test two complex syntactic structures in this study: one which is present in the L1 and one which is only present in the target L2. By comparing HSs and L2ers of similar advanced proficiency levels in this study, we elucidate age of exposure effects on language acquisition. If being exposed to the language in a naturalistic setting before puberty, is an explanatory factor, we should expect HSs to outperform L2ers: because they acquired the HL as a child, age of exposure effects predict that competence will be high for certain grammatical structures, while L2ers who were not exposed to the L2 until after puberty will not be able to fully acquire the L2. When L2ers and HSs pattern together in their second and heritage language, especially when they apply features or characteristics of their shared dominant language to the non-dominant language, we uncover the possibility of dominant language transfer.

A summary of predictions for the L2 group by generative and usage-based accounts is presented in Table 1.1, with check marks representing linguistic competence and exes representing lack of competence. If adult language learners (L2ers) have Full Access to UG even after puberty, we expect advanced L2ers to converge with native speakers on both structures. However, those with lower proficiency will perform better on the L2 structure instantiated in the L1 than the structure only instantiated in the L2, while advanced learners will converge on native-like patterns for both structures.

Table 1.1*Predictions for L2 Acquisition/Competence by Account²*

Passive type:	Periphrastic passive		<i>Se</i> -passive	
	L2 low-int	L2 adv.	L2 low-int.	L2 adv.
Full Access/Full Transfer	✓	✓	X	✓
Partial/No Access	✓	✓	X	X*
Usage-based (target language frequency)	X	X	✓	✓

*In these frameworks, native-like patterns of performance by advanced L2ers are explained by domain-general abilities such as analogy.

Partial Access accounts (e.g., *Representational Deficit Hypothesis/Interpretability Hypothesis*, Hawkins & Chan, 1997; Hawkins et al., 2004) and No Access Accounts (*Fundamental Differences Hypothesis*, Bley-Vroman, 1990), predict that L2ers who acquired Spanish after the Critical Period will only truly have a native-like representation of the structure instantiated in the L1 (regardless of proficiency) but not the structure only extant in the L2. Nevertheless, adult L2ers may show some command of these structures by resorting to domain-general mechanisms, such as probabilistic learning.

Usage-based accounts, on the other hand, refer to input and frequency to explain patterns of acquisition. In this dissertation, we evaluate accounts that would predict that structures that are much higher in frequency in the target language, such as *se*-passives, will be acquired earlier than those that are rare, such as periphrastic passives (Ellis, 2002).

² Although we will not be manipulating the pragmatic context in our experiments, and thus not directly testing *the Interface Hypothesis* (Sorace & Filiaci, 2006), this hypothesis would predict difficulty with both structures of the present study, given that passives are used in a particular discursive context (i.e., to highlight the Theme). Further, it is proposed that interface phenomena affect both HSs and L2ers, so the structures at hand should be difficult for these groups.

Given that predictions of generative accounts of SLA refer to the access (or not) to UG after the Critical or Sensitive Period, we have a strong motivation to test HSs. If Partial/No Access accounts are accurate, we expect HSs to perform more like NSs than L2ers due to their age of exposure and thus full access to UG at the time of their acquisition of Spanish. Regarding usage-based accounts, if input and frequency explain patterns of acquisition, we expect L2ers and HSs to perform similarly well on the more frequent *se*-passive, regardless of age of acquisition.

1.3. Heritage Language Acquisition

Speakers of a heritage language (HL), as mentioned, acquire the HL in a naturalistic setting in the home, mostly through spoken language, and they generally experience a dominance shift around the age of 5 when they begin schooling in the dominant language of the region in which they live (Wiley & Valdés, 2000; Rothman, 2009; Benmamoun et al., 2013, et seq.). HSs may be simultaneous or sequential bilinguals depending on the onset of their exposure to the dominant language (Benmamoun et al., 2013). Importantly for this study, HL speakers (HSs) are exposed to the target language – Spanish in this case – during childhood, but their dominant language in adulthood is the language of the broader community – English in this case. These differences between adult HL and L2 speakers allow researchers to investigate the crucial role of age of acquisition while maintaining the dominant language constant, i.e., English.

In HL situations, as in other bilingual circumstances, the two languages are autonomous but interdependent (Paradis & Genesee 1996) which means that their [Spanish and English] grammars may interact with one another. Usually (though not uniquely) the directionality of this influence is from the dominant to the non-dominant language (e.g., Cuza, 2016; Muysken, 2019; Polinsky, 2018, a.o.). How the HL is affected by the dominant language (typically, the L2 or 2L1) for HSs is still being explored, but besides transfer from the dominant language, non-target like

forms in heritage grammars have been attributed to incomplete acquisition for forms mastered after the dominance shift, or attrition for forms acquired in early childhood, before the dominance shift (e.g., Montrul, 2002; Polinsky, 2006; Montrul, 2008, a.o.).

Further, heritage language acquisition (HLA) varies by domain. HSs tend to exhibit relatively high phonological competence in the HL, maintaining more ‘native-like’ pronunciation in some cases (Au et al., 2002; Knightly et al., 2003; Einfeldt et al., 2019), but their productive abilities vary (Godson, 2004; Amengual, 2016; Kim, 2020; Repiso-Puigdelliura, G. & Kim, J.Y., 2021; Kan, 2021, a.o.). When compared to L2ers, HSs’ abilities to perceive phonological contrasts in the HL are stronger, suggesting an early exposure advantage in this domain (Chang et al., 2008; Lukyanchenko & Gor, 2011; Saadah, 2011). In the morphosyntactic domain, inflectional morphology is more vulnerable than core syntax in HSs’ grammars (e.g., Revised Feature Reassembly, Putnam & Sánchez, 2012 et seq.). HSs diverge from NSs in exhibiting errors with agreement in both the verbal (Polinsky, 1997, 2006; Montrul, 2002; Silva-Corvalán, 1994, a.o.) and nominal domains (Montrul et al., 2008; Polinsky, 2008; Song et al., 1997). Morphology in the nominal domain seems to be more vulnerable than the verbal domain for HSs, and functional categories appear to be more vulnerable to erosion than lexical categories (Ming & Tao, 2008; Xiang et al., 2009; Jia & Bailey, 2008, a.o.). Syntactic knowledge, on the other hand, seems to be quite robust in HSs’ grammars overall (Håkansson, 1995; Montrul, 2005), though HSs exhibit some difficulties with non-canonical word orders, properties of null subjects in pro-drop languages, and long-distance dependencies (e.g., Montrul, 2004; Polinsky, 2009, 2011; Sorace, 2000; O’Grady et al., 2011; Polinsky & Scontras, 2020). Still, some studies suggest that frequency in the target language is an important predictor of linguistic competence, with speakers showing

more 'native-like' knowledge with higher frequency forms (e.g., Hur et al., 2020; López-Beltrán & Carlson, 2020; O'Grady et al., 2011; Perez-Cortés & Giancaspro, 2022).

Overall, HSs constitute a rather heterogeneous subset of native speakers that differs, at times, from both the typical NS and L2ers. As a group, HSs tend to be slower and less accurate in online processing tasks than baseline NSs (e.g., Montrul, 2006; Jegerski et al., 2014; Keating et al., 2016, a.o.) and at times slower than L2ers (Gor et al., 2019), but their performance varies as a function of their language experience, including access to input, amount and type of input, as well as their continued use (or not) of the HL (Montrul, 2022). Although research in HL processing across domains reveals patterns of convergence (perception, core syntax) and divergence (lexicon, morphology) with NSs, it remains unclear whether there is a holistic early exposure advantage for HSs when compared to L2ers, or whether differences between these groups are particular to specific features or domains, task types, and modalities. We contribute to this conversation by investigating HSs' knowledge of Spanish passives, which require verbal agreement with the Patient argument and a non-canonical word order, two particularly vulnerable areas for heritage speakers, to see if these structures are also subject to divergence from 'native-like' grammars.

We can draw interesting comparisons between L2ers and HSs, and in this dissertation, we consider some factors that affect the acquisitional processes of complex structures for them, most importantly, age and mode of acquisition (classroom/written language versus naturalistic spoken language), as well as transfer from the dominant language, frequency in the target language, language proficiency, and reading habits. While comparing speakers from heterogeneous groups such as L2ers and HSs to (non-heritage) native speakers presents challenges in interpretation, work in heritage and L2 acquisition can inform theory, elucidating domain-specific patterns and assessing the effect of age of exposure given that the L2ers and HSs in our study share a dominant

language (English) and comparable proficiency levels. If age of acquisition is the most important factor in ultimate attainment of complex forms, we expect HSs to pattern differently from L2ers, performing more like NSs, in line with previous studies that suggest an early exposure advantage (e.g., Byland, 2009; Flores, 2010, 2012; Montrul, 2011, 2016, 2022). Further, as the field of HL pedagogy grows (e.g., Kagan, 2005; Potowski et al., 2012; Montrul, 2012b; Kisselev et al., 2020; Beaudrie & Loza, 2023, a.o.), comparing these populations offers insight into the particular strengths and pedagogical needs of heritage speakers versus L2 speakers, which informs classroom materials and practices.

1.4. Linguistic Properties of Spanish Passives

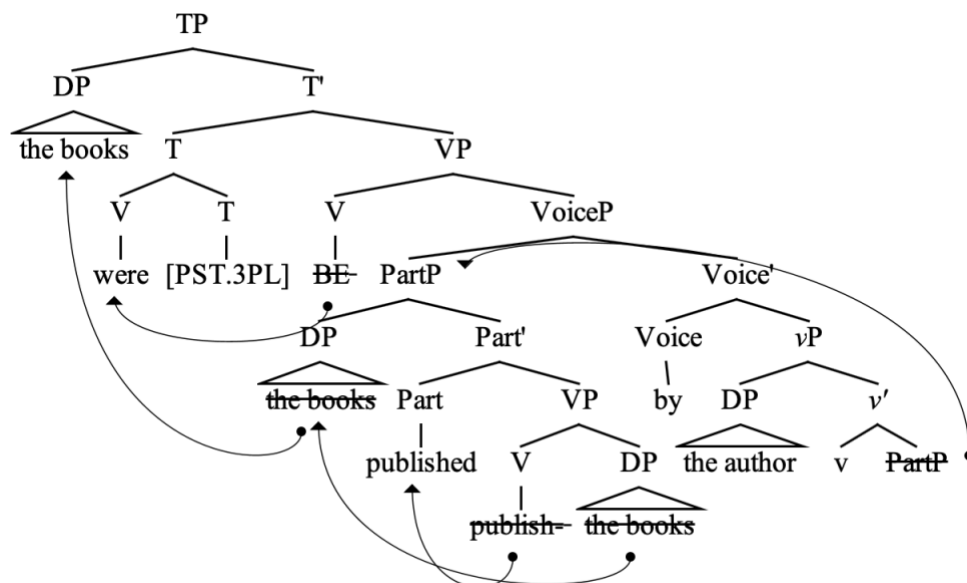
We turn now to our linguistic structures of interest: the periphrastic passive and the *se*-passive.

1.4.1. Periphrastic Passive

The periphrastic passive in English is formed with the auxiliary *be* and the past participle form of the verb. The auxiliary agrees with the logical object complement (Theme/Patient), which acts as the syntactic subject, as exemplified in (1). In (2) we provide a syntactic tree for the sentence in (1) based on Collins' analysis (2005, p. 95).

(1) The books were published (by the author).

(2)

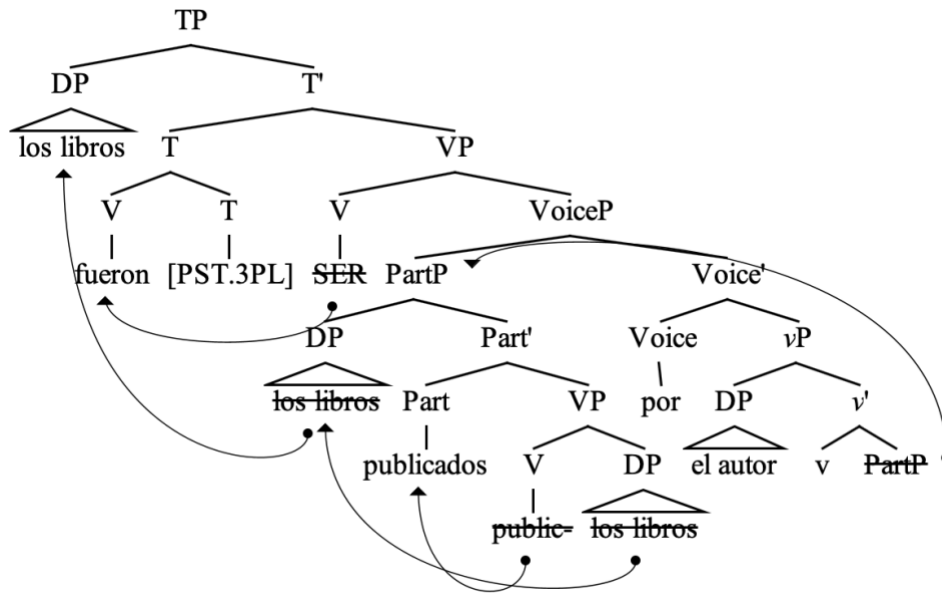


Following Collins' (2005) smuggling analysis, the participle *published* assigns the Patient theta role to its DP complement *the books*. The participle absorbs accusative case. The participle and DP complement move past the Agent argument in Spec,vP by a process of smuggling (of the complement), in which the entire PartP phrase moves to Spec,VoiceP. Then, the DP *the books* can raise to Spec,TP to receive nominative case, triggering agreement on the auxiliary *be* and appearing as the syntactic subject of the sentence. The Agent argument may be pronounced in the long passive form via the *by*-phrase, or it may be implicit in the short passive form, where it is believed to be projected (as a null pronominal form) but not pronounced.

The periphrastic passive in Spanish consists of essentially the same elements and operations, as shown in (3) and (4):

- (3) Los libros fueron publicados (por el autor).
the books BE.PST.3PL published.PTCP.M.PL by the author
'The books were published by the author.'

(4)



Like in English, this type of passive is formed with the auxiliary *ser* 'be' and a past participle, which agrees in gender and number with the logical object/syntactic subject of the passive in Spanish. While the typical order for the periphrastic passive is SV (subject-verb), languages with null subjects, such as Spanish, allow the syntactic subject to appear in post-verbal position (VS order) as shown in (5), in which case bare nominals are allowed, just as is the case for objects, post-verbal subjects of unaccusative verbs, and *se*-passives, as discussed in the next section (Bosque Muñoz & Gutiérrez-Rexach, 2009).³

- (5) Fueron publicados (los) libros.
BE.PST.3PL publish.PTCP.M.PL the books
'(The) books were published.'

1.4.2. *Se*-passive

In addition to the periphrastic passive, Spanish has another verbal passive form expressed with the clitic *se*, which is a highly multifunctional element in Spanish. The *se*-passive is

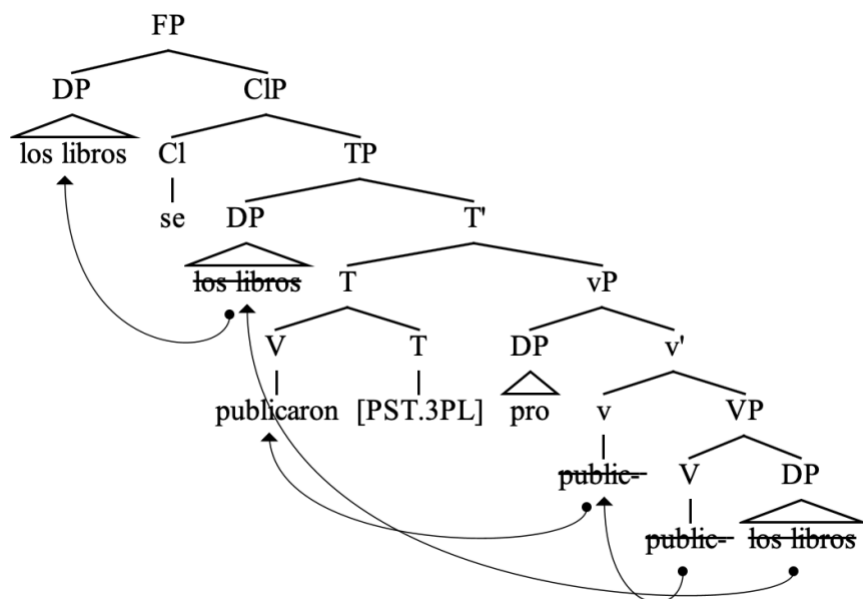
³ However, some authors claim that this order is obtained by postposing the subject rather than the logical object remaining in situ (Bosque Muñoz & Gutiérrez-Rexach, 2009, pp. 380-381).

constructed with the *se* clitic, the inflected verb, and the thematic object with which the verb agrees. The thematic object typically appears after the verb (VS order), shown in (6a), but may also appear in pre-verbal position (SV order), shown in (6b), without any intonation breaks.

- (6) a. Se publicaron los libros (*por el autor).
SE publish-PST.3PL the books by the author
- b. Los libros se publicaron (*por el autor).
The books SE publish.PST.3PL by the author
'The books were published.'

Syntactic analyses of the *se*-passive vary, but it is typically assumed that there is an external argument projected (e.g., Mendikoetxea, 2008, MacDonald, 2017, Romero & Ormazabal, 2019, a.o.), potentially in the form of a generic null *pro* in Spec,vP, which is coindexed with *se*, which occupies a functional head above TP, Cl(itic)P (e.g., Mendikoetxea, 2008), a functional head that is not present in English. As shown in (6), unlike with the periphrastic passive, the *se*-passive does not allow a pronounced Agent argument though the argument is assumed to be projected. An example syntactic tree for the *se*-passive based on Mendikoetxea (2008) (and illustrated in Seabrooks, 2017) is provided in (7).

(7)



The deep object *los libros* in (6) and (7), raises to subject position, Spec,TP, and receives nominative case (Mendikoetxea, 2008).⁴

There are two important restrictions on the distribution of the *se*-passive: First, pronouncing the Agent argument overtly, e.g., via a *por*-phrase, is illicit with the *se*-passive; and secondly, it is generally accepted that the *se*-passive is incompatible with animate syntactic subjects.⁵ Therefore, our experimental materials will only include short periphrastic passives, to match the *se*-passives without a phonologically expressed agent, and inanimate syntactic

⁴ See MacDonald (2017) for an analysis in which *se* heads VoiceP with an implicit non-referential argument *pro* in Spec, VoiceP similar to ‘one’ or ‘they’ in English. Still others have analyzed *se* as a pronominal form generated in external argument position (e.g., Oca, 1914; Romero & Ormazabal, 2019). Different approaches analyze *se* as a clitic that eliminates the external argument position (Benavides, 2010). These different analyses do not have an impact on the general predictions of this study, so we will remain agnostic about the exact nature of *se* in the *se*-passive.

⁵ One possible explanation for this is that the differential object marking (DOM) of the animate deep object would block the necessary subject-verb agreement (Romero & Ormazabal, 2019). But see Tremblay (2005, 2006) who found that 23/27 native Spanish participants accepted animate logical objects without DOM as grammatical. However, they did not control for specificity, the other feature involved in licensing DOM (Fernández Ramírez, 1986). Moreover, native Spanish speakers consulted for this project have agreed with the ungrammaticality of animate complements with the *se*-passive.

subjects/logical objects, to ensure all passives are equally natural.

1.4.2.1. Se-passive versus Impersonal Se. It is prudent here to discuss the impersonal *se* structure in Spanish, given its similarity and potential ambiguity with the *se*-passive: Briefly, Mendikoetxea (2008) suggests that impersonal *se* and *se*-passive sentences have different syntactic structures: while both the impersonal and the *se*-passive involve a generic null pronoun in Spec,vP, the impersonal *se* involves a function head *v* (voice) that has an [ACTIVE] feature and assigns accusative case to the complement, as well as a phonologically null expletive in Spec,TP, which blocks movement of the complement to Spec,TP and prevents subject-verb agreement in the impersonal structure. On the other hand, the *se*-passive has a function *v* head with a [PASSIVE] feature that does not assign case to the complement, which allows the complement to move to subject position (covertly or overtly) and receive nominative case. Thus, the surface difference between the impersonal *se* and the *se*-passive is one of agreement: the verb in impersonal *se* structures always appears in default third person singular form (8) while the verb in *se*-passives agrees with the logical object/syntactic subject of the sentence, which may be singular or plural (9).

- (8) a. Aquí se vende libros. (impersonal *se*)
 here SE sell.PRS.3SG books
 ‘Books are sold here.’
- b. Aquí se contrata a camareros. (impersonal *se*)
 here SE hire.PRS.3SG DOM servers
 ‘Servers are hired here.’
- (9) a. Aquí se vende petróleo. (ambiguous)
 here SE sell.PRS.3SG gas
 ‘Gas is sold here./They sell gas here.’
- b. Aquí se venden libros. (*se*-passive)
 here SE sell.PRS.3PL books
 ‘Books are sold here./They sell books here.’

Thus, a sentence such as (9a), with the singular inanimate Theme *petróleo* ‘gas’, is ambiguous between the *se*-passive and the impersonal *se*. As MacDonald (2017) summarizes, in impersonal structures, agreement is always in default 3SG form, and the Theme behaves like any other object in Spanish, allowing animate Themes marked with differential object marking as in (9b). With *se*-passives, on the other hand, the sole overt DP, the Theme argument, acts as the syntactic subject, receiving nominative case and modulating verbal agreement (MacDonald, 2017). Thus, our experimental materials will only include plural syntactic subjects so as to unambiguously elicit productions and judgments for the *se*-passive.

1.4.3. Frequency and Register

Passive forms are sometimes referred to as ‘literary forms’ (Tolchinsky & Rosado, 2005), given their prevalence in written registers, particularly in newsprint. Even so, in an analysis of eight Spanish texts, both written and spoken, including bulletins, novels, lectures, and series, Green (1975) found that the *se*-passive in Spanish is more common (>50% of occurrences of non-simple-active forms across texts) than the periphrastic passive (~6% of the occurrences of non-simple-actives form across texts) in both written *and* spoken corpora.⁶

We also note that the periphrastic passive is more common in English than Spanish, for both adults and children: Berman and Slobin (1994) carried out a crosslinguistic developmental study with 12 adults and 48 children across five languages. Notably, all of the English-speaking adults and around half of the children ages 4, 5, 6, and 9 used periphrastic passives in a narrative task, with around one third of these passive tokens appearing in the full passive form with the agentive *by*-phrase. In stark contrast, in the Spanish data, only one of 12 adults and none of the 48

⁶ In the group of ‘non-simple-active forms’, Green includes reflexives with *se*, passives with *ser* and *estar*, and what he calls passives with less common modals such as *poder*, as well as unaccompanied participial forms, such as *una misión española compuesta por treinta hombre* ‘a Spanish mission composed of thirty men’ (p. 355).

children (12 in each of the same age groups listed above) used a full periphrastic passive in the same task (Berman & Slobin, 1994).

Jisa et al. (2002) analyzed written texts from five languages in both the narrative and expository genres for 9-10 year-olds, 12-13 year-olds, 15-16 year-olds, and adults. The written texts (total: $n = 400$) were from ten participants in each age group, in each language. From this crosslinguistic study, we confirm that the frequency of passive forms varies by language, and depends on the availability of alternative structures for Patient focalization. Further, passive use increases with age, which shows an upward developmental trend. Finally, passive structures were more frequent in expository than narrative texts in this study, further supporting the idea that use of passives varies by genre, as well as language and age group.

Table 1.2

Mean Percentage of Periphrastic Passive Constructions in all Clauses in Spanish and English Texts by Age and Group, from Jisa et al., (2002, pp. 171-171)

	9-10 year-olds	12-13 year-olds	15-16 year-olds	Adults
English narrative	2.3%	2.4%	2.6%	3.7%
English expository	4.6%	8.1%	12.43%	11.48%
Spanish narrative	0%	.32%	1.2%	1%
Spanish expository	0.76%	1.6%	2.4%	4.5%

As shown in Table 1.2, passive constructions were around three times as frequent in English texts than in Spanish texts. Jisa and colleagues point to the availability of other forms to downgrade Agents and/or to promote Patients in Spanish, specifically the *se*-passive and impersonal *se*, together with the lack of availability of these forms in English, as an explanation for the crosslinguistic variability of periphrastic passive frequency.

Regarding passives in written Spanish and English, Hurtado and Montrul (2021) note that in a search of the CORPES (Real Academia Española), periphrastic passives accounted for 0.2% of utterances (1195.55 in a million) in written Spanish discourse. On the other hand, Biber et al. (1999) note that the English periphrastic passive accounted for 1.75% of utterances in written academic texts (17,500 in a million) and 0.65% of utterances in fictional texts (6,500 in a million).

To summarize, studies have shown that English periphrastic passives are approximately three to eight times as common in written English than in written Spanish, and approximately twice as common in oral English than in oral Spanish. Further, the *se*-passive is approximately eight times as frequent as the periphrastic passive in Spanish (Green, 1975).

1.5. Acquisition of Passives

1.5.1. Child Language Acquisition of Passives

In order to establish expectations for our heritage speaker group, we begin with an overview of the acquisition of passives in children. Experimental work suggests that young children (<6;0) struggle with periphrastic verbal passives, long and short (e.g., English: Bever, 1970, Maratsos, 1974, Hirsch & Wexler, 2006; Catalan: Gavarró & Parramon, 2017, González Garcia, 2018; Spanish: Pierce, 1992, Oliva & Wexler, 2018; Spanish-English bilingual children: Keller, 1976). Given that the periphrastic passive allows for the overt expression of both the Patient (syntactic subject) and Agent (expressed in the *por*- or *by*-phrase), many studies with children test the interpretation of the Agent/Patient roles in long passives, in which the semantic roles may be interpreted in reverse if children are using a linear strategy, interpreting the first NP as the Agent argument regardless of the syntactic structure.

One study that has investigated word order effects in child passives is Pierce (1992), which reported on the acquisition of Spanish passives in Mexican Spanish-speaking children ages 3-5

with a picture-matching task (Task 1) and a semi-imitation elicited production task (Task 2, described in the next section). In the picture-matching task, children heard the experimenter describe a situation with either a full periphrastic passive or an active transitive sentence with reversible action verbs: *peinar* ‘to comb’, *lavar* ‘to wash’, *ver* ‘to see’, and *oír* ‘to hear’. Children had to select the picture that matched the sentence they heard between two pictures depicting the same events, with the same two characters, with the semantic roles (Agent/Patient) reversed, e.g., for the stimuli in (10), in one picture María combed Juan and in the other picture Juan combed María. Sentences were presented in both *SVpor*-phrase (10a) and *VSpor*-phrase (10b) order with the goal of assessing word order effects, given the notion that the VS (10b) order would at least maintain the verb-Patient (and Agent before Patient) order that is canonically observed in active sentences. The experiment also tested the presence of an agreement cue on the participle, such that the agreement cue indicated the gender of the appropriate Patient, e.g., in (10) *peinada* with feminine marking agrees with the Patient argument *María*. The children did not show evidence of a facilitation effect for the VS order (10b), but the developmental pattern did trend upward such that older children (5;0) performed better in their comprehension of VS passives as shown in Table 1.3, but not in a significant way (no main effect).⁷

- (10) a. María fue peinada por Juan.
 María be.PST.3SG comb.PTCP.F.SG by Juan
 b. Fue peinada María por Juan.
 be.PST.3SG comb.PTCP.F.SG María by Juan
 ‘María was combed by Juan.’

(Pierce, 1992, p. 80)

⁷ An important consideration here is the syntactic analysis of the periphrastic passive in VS order by Bosque Muñoz & Gutiérrez-Rexach (2009), who suggest that the periphrastic passive in VS order is not a case of the Patient/Theme remaining in situ but rather involves a postposing of the syntactic subject such as for focus situations. This insight may explain why the children did not show facilitation in the VS order.

Only 5-6-year-old children performed above chance on SV passives in the no agreement cue condition.

Table 1.3

Percentage of Correct Responses in Experiment 1 of Pierce (1992) by Age, Order, and Agreement Cue

Order	SV passives		VS passives	
	Agreement Cue	No Agreement Cue	Agreement Cue	No Agreement Cue
Group 3 (5;0)	83.4	66.7	75.0	66.7
Group 2 (4;0)	83.4	33.4	41.7	50.0
Group 1 (3;0)	66.7	50.0	41.7	66.7

The second experiment of Pierce’s study will be described in the following section that focuses on the *se*-passive.

More recently, Oliva and Wexler (2018) investigated the acquisition of the periphrastic passive in 60 Spanish-speaking children from Madrid, ages 3;0-6;11. They included both adjectival and verbal passives, as well as actional versus non-actional (e.g., *oír* ‘to hear’, *amar* ‘to love’) passives in order to test the adjectival strategy children may adopt in order to interpret passives. This strategy, also evidenced in Catalan-speaking children (Gavarró & Parramon, 2017; González García, 2018), may allow children to bypass the syntactic movement operation required to analyze the deep object as the syntactic subject in a verbal passive, allowing instead for interpretation of a passive as a copular construction with an adjectival participle (Maratsos, 1985; Borer & Wexler, 1987; Wexler, 2004; Hirsch & Wexler, 2006). In a picture-matching comprehension task, each verb appeared in the active, short passive, and full passive, and the participants selected one of two pictures, in which the theta roles (Patient/Agent) were reversed

(as in Pierce, 1992). Results suggested that children perform better on active than passive sentences, and within passives, they perform better on short passives and actional passives than long passives and psychological passives. These results support the hypothesis that children adopt an adjectival strategy and suggest that in the long passive, the *por*-phrase blocks the accessibility of the adjectival interpretation. Additionally, there was no difference in performance between short and long psychological passives, as expected since non-actional verbs make for bad adjectives (e.g., ‘the doll was seen’ cannot be restated as ??*the seen doll*). The results of their Experiment 2 support the same ideas: they tested aspectual interpretations of passives, in which children selected a picture that either depicted the ongoing action (verbal passive) or the result (adjectival passive). They found that children in all age groups used the adjectival strategy most often for both verbal and adjectival passives. They interpret these results to mean that real verbal passives are not acquired until approximately age 6, and Spanish-speaking children are able to ignore the auxiliary difference in order to use the adjectival strategy. Taken together, these studies suggest full acquisition of verbal passives occurs around the age of 6 in Spanish, similar to other languages (English: Hirsch & Wexler, 2006; Catalan: Gavarró & Parramon, 2017; González García, 2018, a.o.).

1.5.2. Se-passives in L1 Spanish-speaking Children

Se-passives seem to emerge earlier than periphrastic passives in L1 Spanish-speaking children, at least in production, since there are, to our knowledge, no comprehension experiments. In the second task of Pierce’s (1992) study with L1 Spanish-speaking children ages 3;0-5;0 mentioned above, experimenters showed a picture and described the situation either with the active reflexive, the active intransitive, or the *se*-passive. The active reflexive (with the verbs *peinarse* ‘to comb self’ and *lavarse* ‘to wash self’) and intransitive active sentences (with the verbs *bailar*

‘to dance’ and *cantar* ‘to sing’) had animate subjects, and the *se*-passive sentences (with the verbs *quebrar* ‘to break’, *cerrar* ‘to close’, *manchar* ‘to stain’, and *colgar* ‘to hang’) had inanimate syntactic subjects.⁸ All subjects were plural, in order to control for the ambiguous reading of the *se* + singular verb structure that could be interpreted as both an impersonal *se* structure or a *se*-passive. The children were then asked to describe the next picture, which consisted of the same action but a different subject, so they had to replace the NP, in the same way. As in Pierce’s experiment with periphrastic passives, the prediction was that younger children would show difficulty with the SV order (11a) but not the VS (11b) order with *se*-passives.

- (11) a. Las cortinas se colgaron.
 the curtains SE hang.PST.3PL
 ‘The curtains were hung.’
- b. Se colgaron los cuadros.
 SE hang.PST.3PL the pictures
 ‘The pictures were hung.’

(Pierce, 1992, p. 80)

The results for this task are shown in Table 1.4. The children in this study did indeed perform less accurately, as measured by their ability to imitate the sentence they heard with a new DP, with the SV *se*-passive than the VS *se*-passive, and their poorest performance was on *se*-passive trials compared to active intransitive and reflexive trials. They tended to replace the *se*-passive SV with the *se*-passive VS while they replaced active VS with active SV.

⁸ N.B. Some of these verbs, including *quebrar* ‘to break’ and *cerrar* ‘to close’, allow a causative-inchoative alternation and are able to be used both transitively and as unaccusative structures, which, in Spanish, are often marked with the clitic *se* (Mendikoetxea, 1999a, b). It is possible that the children in this study applied an unaccusative structure.

Table 1.4

Percentage of Correctly Imitated Productions with the Se-Passive in Pierce's Experiment 2

(1992, p. 69)

	Group 1 (3;0)	Group 2 (4;0)	Group 3 (5;0)
Passive SV	34.6	41.2	50.0
Passive VS	42.3	69.1	80.0

The results on the second task show that young Spanish-speaking children (3;5-6;0) can produce the *se*-passive, and older children (5;0-6;0) more so, as expected. It is also worth noting here that "better performance" was measured as a function of how often the child produced the same structure as the experimenter when describing their own picture, i.e., how much priming was observed. Notably, in Experiment 1 (a receptive task) there was no facilitatory effect for post-verbal subjects (VS) with periphrastic passives, but there was a facilitatory effect for post-verbal subjects in Experiment 2 (a production task) with *se*-passives. This could be due to the higher cost associated with production than comprehension, which in turn may exacerbate word order effects. Unfortunately, Pierce did not directly compare children's performance on periphrastic passives and *se*-passives in equivalent tasks.

Corpus data shows that *se*-passives emerge earlier than periphrastic passives: Cychosz and Garrote Salazar (2016) analyzed child-directed and spontaneous speech of 3-6-year-old Spanish-speaking children, plus parents and teachers ($n = 59$) in the CHIEDE corpus in order to characterize the frequency of different passive structures in their speech, including periphrastic and *se*-passives. They recorded instances of verbal passives with *ser*, adjectival passives with *estar*, *se*-passives (which they term 'reflexive passives', and middle passives, which they classify as instances in which the subject NP is pre-verbal, e.g., *El coche se vendió* 'The car was sold' (p. 313)). They

found a pattern in which the children and adults used a similar distribution of passives, from most to least frequent: reflexive (*se-*)passives (children: 78.7%, adults: 79.6%); middles (children: 12.4%, adults: 11.1%); adjectival (resultative) passives with *estar* (children: 9%, adults: 8.6%), and periphrastic (children: 0%, adults: 0.6%).

Cychosz and Garrote Salazar (2016) make a few observations regarding the advantage children show with the *se*-passive: First, the distribution of the passives in the child-directed speech was similar to the distribution in the spontaneous child speech, suggesting that children hear significantly more *se*-passives than periphrastic passives in their input. In this corpus, the *se*-passive appeared with verbs that typically take the clitic *se* such as *romperse* ‘break’ and *llamarse* ‘name’, which may indicate they are lexicalized chunks.⁹ Further, they argue that the verbal passive auxiliary *ser* competes with the copula *ser*, and since the passive *ser* has a highly variable form (irregular inflection), it may be harder for the children to acquire than the less variable *se*-passive. Finally, the authors suggest that perhaps children are analyzing *se* as the syntactic subject of the *se*-passive sentence, as an impersonal ‘one’, which leads to an analysis of this structure without movement, which is known to be an issue for children acquiring the periphrastic passive. If this is the case, children may tend to use singular agreement on the verb rather than plural agreement with plural thematic objects (i.e., their ‘*se*-passives’ are in fact impersonal *se* constructions). This prediction is unconfirmed. Importantly, earlier use does not necessarily implicate earlier acquisition.

Seabrooks (2017) analyzed longitudinal data from four Spanish-speaking children ages 1;4-4;6 in the CHILDES corpora to test Mendikoetxea’s (2008) three-way split hypothesis of different structures for the CL-IC (Clitic Impersonal Constructions) constructions, impersonal *se*

⁹ Cf. Jackson-Maldonado, 1998, who showed that 2-3 year-old Spanish-speaking children use *se* in a contrastive way, meaning they used some verbs both with and without *se*.

and *se*-passive, and transitive sentences to explore whether children acquire the different structures at different times, and found that, like periphrastic passives, *se*-passives emerge after active structures. Specifically, the results from the study suggest that transitive sentences emerge first (first appearance around 1;5), followed by *se*-passives (first appearance around 1;7), and impersonal *se* structures are acquired last (first appearance around 2;0). One potential explanation for this, according to Seabrooks, lies in *Markedness Theory* (Jakobson, 1990), since cross-linguistically, actives are the highest frequency of the three structures, followed by passives, then impersonals (Blevins, 2003). Compared to passives, impersonals are less common crosslinguistically overall, and therefore, the results do not preclude that children may be able to produce and comprehend them sooner than as evidenced in the data set (Seabrooks, 2017, p. 10).

Summarizing, although production data seems to suggest that *se*-passives are acquired before periphrastic passives in Spanish, it is not possible for us to convincingly argue that this is in fact the case; children may produce *se*-passives and not periphrastic passives for the same reason that adults do, i.e., because the *se*-passive is more commonly used than the periphrastic passive in spoken speech and otherwise in Spanish. Moreover, the superficial overlap that exists between *se*-passives and other syntactically simpler *se* constructions does not always allow us to determine what structure children are assigning to their *se*-constructions. Lastly, there is, to our knowledge, no study that has examined children's comprehension of *se*-passives, let alone in relation to periphrastic passives. Given their similar level of syntactic complexity (see Section 1.4), we speculate that these may not be fully acquired at drastically different stages. Whether HSs have fully acquired the *se*-passive or periphrastic passive before the dominance shift (at approximately age 5 or 6) is unclear.

1.5.3. *Heritage Language Acquisition of Passives*

Studies suggest that periphrastic passives present some interpretation difficulties for heritage language learners. In an early study on Spanish-English bilingual children living in Manhattan who spoke Puerto Rican, Dominican, or Ecuadorian Spanish at home, Keller (1976) had children ages 3;0-5;0 act out sentences they heard consisting of reversible actives and passives (e.g., *The bull pushes the lion/The lion is pushed by the bull*). They found that bilingual children showed similar developmental patterns to those found in Bevers (1970) and Maratsos (1974) in which, around age 4, children seem to default to an active interpretation, causing difficulties for interpreting the passive since the linearly first NP in passives is not the Agent, as in the active form. Keller found further evidence that the recovery from this drop in comprehension of the passive seemed delayed for bilingual speakers in their study when compared to age-matched monolingual children.

Adult HSs also seem to struggle with some aspects of the periphrastic passive: Valenzuela et al. (2015) tested high-proficiency heritage speakers of Spanish from Canada and the U.S. (plus a native speaker control group) on stative (adjectival) and eventive (verbal) passives in Spanish in order to test their knowledge of auxiliary selection and aspectual properties of these structures. The HSs in this study tended to overextend the use of *estar*, allowing for generic interpretation of the subject, which is only licit with the verbal (*ser*) passive, as well as allowing overt expression of the Agent argument with the *estar* adjectival "passive", again only licit with the verbal passive. It is unclear whether this difficulty is due to attrition of previously known features or incomplete acquisition due to a significant decrease in input right before they had fully acquired the morphosyntax of this structure in Spanish.

Studies comparing L2ers and HSs directly find some important differences between the

groups, particularly in that HSs tend to excel in the aural/oral mode while L2ers perform better in the written mode (e.g., Montrul et al., 2008; Montrul et al., 2013; Polinsky, 2015, a.o.). Sánchez-Walker and Montrul (2021) compared L2ers and HSs of Spanish to monolingually-raised native speakers in a series of tasks aimed at testing aspectual properties of adjectival and verbal passives in Spanish. Participants completed a picture-matching task, which, like in Gavarró and Parramon (2017) and Oliva and Wexler (2018), involved selecting a picture showing either the event/action (verbal passive) or the resulting state (adjectival passive), and an acceptability judgment task (AJT) in both the written and aural modes. In the AJT, L2ers were more accurate in the written than the aural mode, and HS were more accurate than L2ers overall. In the picture-matching task, both groups were more accurate with adjectival than verbal passives, and HSs were more accurate than L2ers overall. Further, HSs were more accurate in the aural than the written mode. Interestingly, L2ers showed an effect of the number of Spanish courses taken, such that those L2ers with more Spanish course experience performed better than those with fewer Spanish courses taken. This effect was not found for HSs, but the HSs showed an effect for language experience, such that those who continued to use the HL at high rates and/or used the HL at school in a bilingual school setting, were more accurate than those who experienced a strong dominance shift at the onset of English-dominant education. These patterns motivate further testing of the acquisition and maintenance of passives in these groups, given that a variety of factors, including age and nature of language exposure and language dominance, appear to be at play.

There is a paucity of work on *se*-passives with HS of Spanish, but one previous study suggests it could also be a vulnerable construction for HSs – either due to attrition or incomplete acquisition. Rodriguez (2018), tested HS processing of active sentences and *se*-passives (in VS order, with pre-posed locative adjuncts) in a self-paced reading task. Interestingly, and unlike the

NS control group, HSs did not show a processing time difference between grammatical (agreeing) *se*-passive sentences such as (12a) and ungrammatical (with *se* + 2SG/1PL morphology) *se*-passive sentences such as (12b).¹⁰

- (12) a. En la lavandería se lavan las medias con detergente bueno.
In the laundromat SE wash.PRS.3PL the socks.PL with detergent good
- b. *En la lavandería se lavamos las medias con detergente bueno
In the laundromat SE wash.PRS.3PL the socks.PL with detergent good
'In the laundromat, the socks (*SE) are washed with good detergent.'

This lack of a slow down suggests that HSs may be ignoring *se* and using some sort of superficial analysis, perhaps projecting what should be the syntactic subject of the *se*-passive in complement position (*se*VS may be analyzed as *pro*VO). This finding motivated us to test mismatched verbal agreement in our receptive acceptability judgment task (Experiment 2 of the present study).

1.5.4. Second Language Acquisition of Periphrastic Passives

With regards to L2 populations, periphrastic passives present some difficulties for L2ers crosslinguistically, particularly with certain properties of the auxiliary verb and interpretation in child and adult L2 speakers.

Much of the work on the Spanish periphrastic passive in adult L2 research has involved testing properties of the auxiliary *ser* and copula *estar*, which prove problematic for adult L2ers. Bruhn De Garavito and Valenzuela (2005) tested several properties of the Spanish periphrastic passive via an acceptability judgment task (AJT) and a sentence selection task administered to 9 L1 English - L2 Spanish speakers and 10 NS controls. The project was aimed at disentangling L2 Spanish (L1 English) learners' difficulties with the passive given that some experiments suggest that the issue arises with the auxiliary selection: while English, like Spanish, has both verbal and

¹⁰ Examples by Rodriguez (p.c.).

adjectival passives, in English, only one verb is used as an auxiliary and copula, respectively, with each type. Spanish, on the other hand, uses *ser* with verbal passives and *estar* with adjectival “passives”. The difference in auxiliary and copula selection has implications for properties of agentivity, aspect, and the use of the prefix *in-* (similar to *-un* in English). Regarding agentivity, L2ers did not demonstrate knowledge that *estar* forces an adjectival reading, making an agentive *por*-phrase illicit (shown below in 13). However, the L2ers did demonstrate knowledge of aspectual differences between adjectival and verbal passives, showing the expected (‘native-like’) tendencies to reject imperfect aspect with verbal passives and perfective aspect with adjectival passives. Further, the L2ers recognized that the prefix *in-* is felicitous with adjectival but not verbal passives, as demonstrated in (13): *in-* can be added to the adjective *acabada* (‘finished’) when used with *estar*, but since *ser* forces the verbal reading, *in-* cannot be added to the participle *acabada* (given the nature of the participle as derived from a verb – there is no verb **inacabar* ‘*unfinish’).

- (13) Esta casa está (*es) inacabada (*por Carmen).
 this house BE.PRS.3SG (*BE.PRS.3SG) unfinish.ADJ.F.SG (*by Carmen)
 ‘This house is unfinished (*by Carmen).
 (Bruhn De Garavito & Valenzuela, 2005, p. 14)

Results suggest that the L2ers overextend the use of *estar*, allowing *estar* or adjectival passives with an agentive *por*-phrase and allowing generic interpretation of the agent in adjectival passives, both illicit in Spanish.¹¹ As previously mentioned, this overextension is replicated in other studies with both L2ers and HSs (Bruhn De Garavito & Valenzuela, 2008; Valenzuela et al., 2015). Further, the authors note that the ‘native-like’ performance on the aspectual properties of the passive may be a relic of the tendency to emphasize aspect (specifically, the preterit/imperfect distinction) as a learning target in the L2 Spanish classroom. Additionally, high performance with

¹¹ Notably, the native speaker controls in this study tended to prefer what the authors term the ‘impersonal passive’ or *se*-passive in verbal passive contexts with generic interpretation of the agent.

the prefix *in-* may be direct positive transfer from English *un-*, which behaves the same, attaching to adjectives but not verbal participles. Meanwhile, agentivity and genericity differences across the two passive types whose surface form requires selection between *ser* and *estar* is more difficult for the L1 English speaker to map onto existing L1 structures in their grammar. The authors note that while child learners are able to eventually acquire these subtle distinctions, for the L2ers “it is the input in relation to the L1 that makes acquisition difficult. The L1 acts as a filter that does not allow the learners to access the trigger [for verb selection]” (p. 22).

Processing studies confirm adult L2 speakers exhibit relatively more difficulties with passives than actives. Lee and Doherty (2019) tested native ($n = 11$) and non-native ($n = 26$) (L1 English) Spanish-speakers’ processing of the Spanish periphrastic passive with an eye-tracking task administered before and after participants received Processing Instruction (VanPatten, 1996) to assess the effectiveness of this pedagogical method on L2 comprehension of passives. Processing Instruction is a strategy to teach L2ers language-specific strategies for interpreting structures with non-canonical word orders (i.e., passives) that may be problematic given learners’ tendency to rely on word order as a processing strategy (VanPatten, 1996). Participants heard a sentence, long passive, or active transitive, and were shown two pictures with the semantic (Patient/Agent) roles reversed.¹² They found that both native and non-native speakers showed a processing cost for passives, such that it took longer for them to fixate on the appropriate image to match the sentence in the passive condition (540ms with actives v 702ms with passives for NSs and 548ms with actives in the post-test versus 707ms with passives in the post-test). Further, both speaker groups were more accurate with active than with passive sentences, selecting the appropriate interpretation of the semantic roles more often with active sentences. After

¹² Short passives were included in the experiment but not in the analysis.

receiving Processing Instruction, non-native speakers improved their performance on both active *and* passive sentence comprehension. The authors conclude that non-native speakers can acquire the Spanish periphrastic passive with an appropriate pedagogical strategy.

To summarize, L2ers tend to struggle with interpretation of semantic roles (like L1-speaking children) and the auxiliary selection that distinguishes between verbal and adjectival passives, opting to extend the use of *estar* to verbal contexts, such as with generic Agents and explicit *por*-phrases. This suggests that some of L2ers' issues with periphrastic passives may lie in features that are not mappable onto their L1 English (e.g., the auxiliary selection, given that English only uses one auxiliary for both verbal and adjectival passives).

1.5.5. Se-passives in L2 Spanish

Turning now to *se*-passives, some studies suggest that L2 Spanish speakers also struggle with *se*-passives: Alonso (2011) tested adult L1 English - L2 Spanish speakers from two universities and a lifelong learning group in England on semantic and syntactic impersonality in which the Agent of the action is unknown or unexpressed, which involves several structures used with *se* in Spanish, including the *se*-passive. The group with fewer than five years' experience with Spanish struggled with structures without English impersonal equivalents such as 'secretary required', which they translated to *secretario necesitado* instead of opting for a more natural phrase with *se*, such as the impersonal *se busca secretario*. Further, they adopted English verbal paradigms such as the periphrastic passive: for 'the news will be known': the group with fewer than five years of Spanish experience opted for *las noticias serán conocidas* (~51% of responses) while the group with more than five years' experience employed the *se*-passive *se conocerán las noticias* at a higher rate (~42%) than the periphrastic passive (~38%). Alonso takes these results to mean that the structures with *se* can be acquired but must be given special attention to avoid

fossilization of English-like forms that are unnatural or illicit in Spanish. Further, these results suggest that (L1 English) L2 Spanish speakers may acquire the Spanish periphrastic passive before the *se*-passive given the possibility of positive transfer from English.

Likewise, in a series of acceptability judgment task experiments testing L2ers' knowledge of formal properties of impersonal *se* and *se*-passive, Bruhn De Garavito (1999) and Tremblay (2005, 2006) found that adult L2 Spanish speakers tend to struggle with structural properties of impersonal *se* and *se*-passive, especially in the conditions in which they were to reject ungrammatical sentences, such as (14) and (15) below.

(14) *Se arrestaron a los ladrones en menos de dos horas.
SE arrest.PST.3PL A the.M.PL thieves in less than two hours
'The thieves were arrested in less than two hours.'

(15) *Se conoce los amigos porque están dispuestos a ayudar.
SE know.PRS.3SG the.M.PL friends because be.PRS.3PL ready to help.INF
'The friends are known because they are ready to help.'

(Tremblay, 2005, p. 259)

In particular, L2ers across these studies failed to reject the ungrammatical *se*-passive with differential object marking on the animate DP, shown in (14), as well as the ungrammatical impersonal *se* without DOM on the animate DP, shown in (15).

Contrastively, other studies find that (L1 English) L2 Spanish speakers are able to acquire *se*-passives despite not having an English equivalent. In a corpus study, Araya and Monteserin (2011) studied different structures with *se* in 97 adult L2 Spanish speakers of three proficiency levels (basic, intermediate, and advanced) and two L1 child speakers. Following Suñer (1973) they included eight uses of *se*: reflexive, reciprocal, aspectual, inherent, dative, ergative, passive, and impersonal *se*. Notably, cases which were ambiguous between passive and impersonal *se* were those which appeared in third person singular form, and they were classified as 'ambiguous' in the analysis. The authors attempted to reconcile patterns of use of these structures in the L1 data from

CHILDES with those found in L2 data from the written portion of the Certificate of Spanish Language and Use (CELU) exam. That is to say, the L2 data was written production while the L1 child data was spontaneous speech. They found that ergative *se* was the first type to appear, as well as the most commonly used, for both groups. They found evidence of productivity with *se* in the child data (also found in Jackson-Maldonado et al., 1998) and in the L2 data: verbs were used both with and without *se*, suggesting that children and L2 learners are not producing lexicalized chunks. Further, both groups used impersonal *se* expressions, and the children used *se*-passives at ages 1;10 and 2;0. Both groups showed very few errors such as clitic omission (<10 across both groups) or incorrect conjugations. The authors conclude that L1 and L2 acquisition of *se* structures is similar and that, in contrast to Lee and Doherty (2019, described above), input alone is enough for L2ers to learn structures with *se*.

De la Fuente (2015) tested the effects of computer-assisted language learning (CALL) and metalinguistic feedback in the L1 or the L2 on *se*-passives in adult L2 Spanish (L1 English) speakers and, like Araya and Monteserín (2011), and like Lee and Doherty's study with periphrastic passives (2019), also found that L2ers are able to acquire *se*-passives with appropriate pedagogical interventions. Participants completed controlled production tasks (cloze sentences in which they had to conjugate the verb correctly) as well as a metalinguistic judgment test in which they selected the Spanish translation of the English sentence and a constructed response recognition test in which they completed sentences and participants received metalinguistic feedback. They found that both groups improved in their use of the *se*-passive with CALL, i.e., they made fewer agreement errors (e.g., correctly demonstrating agreement between the verb and the Theme argument, as opposed to using default 3SG agreement with plural Themes) and more correct translations/target sentence completions after treatment. Notably, their results demonstrate

that learners do seem to be able to acquire the agreement feature of the *se*-passive with suitable pedagogical interventions.

While some studies suggest successful attainment of the *se*-passive with appropriate input or intervention, others find that, like with periphrastic passives, L2ers tend to struggle with properties of the *se*-passive that are not mappable onto their L1 English, such as (illicit) differential object marking of animate subjects and verbal agreement with the Theme argument. In other words, English does not mark animacy via DOM, nor does English have a similar passive form constructed with a clitic and a verb which agrees in number with the Theme argument, making the acquisition of these structures difficult for L1 English speakers who are learning L2 Spanish after the Sensitive Period.

1.5.6. Spanish Periphrastic Passives across Three Adult Speaker Groups

In an eye-tracking/picture matching task with Spanish-speaking NSs, HSs, and L2ers (Lopez-Hevia, 2021), NSs did not fixate on the auxiliary *ser* nor on the *por* in the *por*-phrase with long periphrastic passives, but L2ers and HSs showed difficulties with processing (longer fixations on the passive participle, for example) and accuracy (correct identification via fixation of thematic roles in the picture matching task) with the periphrastic passive. This suggests that L2ers and HSs have difficulty processing the periphrastic passive, which strengthens our motivation to test auxiliary agreement in the Acceptability Judgment Task of the present study described below. Interestingly, in the Lopez-Hevia study, as Spanish language dominance and proficiency increased, accuracy increased.¹³ We aim to replicate this pattern in our study by including an independent measure of proficiency and assessing whether it predicts performance in any of our experimental conditions.

¹³ While Lopez-Hevia used an elicited imitation task to measure proficiency, we use a lexical recognition task to measure proficiency.

1.5.7. Interim Summary

To summarize, in L1 Spanish acquisition, periphrastic passives are not mastered (i.e., show fully adult-like interpretation) until about 6 years old. On the other hand, *se*-passives seem to be produced earlier, around 2-3 years old, which could suggest that children acquire the appropriate grammar for *se*-passives earlier. If this is the case, Spanish HSs would have acquired the *se*-passive before starting school in an English-dominant environment, but they may not have acquired or mastered the periphrastic passive before the dominance shift process begins. However, due to the superficial overlap between *se*-passives and other structures (e.g., impersonal *se*), we have no evidence to preclude that they may actually only *seem* to have acquired the *se*-passive when in fact they project a simpler structure, e.g., an impersonal or unaccusative structure without an external argument. Thus, it is possible that HL-acquiring children have not fully acquired either structure before the sudden decrease of Spanish input, which would explain their difficulties with both.

On the other hand, although L2ers would likely be exposed to the *se*-passive before the periphrastic passive in the classroom (e.g., in the *Unidos* textbook used at the University of California, Los Angeles in the Spanish language program, Guzman et al., 2019), a parallel structure for the periphrastic passive exists in English, which allows the mapping of the L2 form onto the L1 structure, while the *se*-passive does not. Like child L1 speakers, adult L2ers struggle with the periphrastic passive (interpretation, auxiliary selection) but seem to be able to acquire it (with pedagogical training). They also have difficulties with some properties of the *se*-passive (accepting DOM, which is illicit with the *se*-passive), as expected, since it does not exist in English. HSs also show similar difficulties with passives (interpretation, auxiliary selection, agreement), but we do not know anything about their performance on *se*-passives when compared to periphrastic passives.

Further, as mentioned, L2ers are often exposed to written texts at a higher rate than HSs and tend to excel in written tasks when compared to HSs, who tend to excel in the aural mode (e.g., Sánchez-Walker & Montrul, 2021; Montrul, 2016; Montrul et al., 2014, a.o.). This difference across modalities may predict an advantage for L2ers, at least with the periphrastic passive, which is more common in written than spoken speech.

There are relatively few studies on HS acquisition of passives and no studies comparing productive and receptive abilities of *se*-passives versus periphrastic passives in native, L2, or heritage speakers. In this dissertation, I aim to fill these empirical gaps and address some questions that have not yet been answered.

1.6. Structural Priming

Because our production task utilizes a structural priming paradigm, we devote this section to previous work on L1, L2, and cross-linguistic structural priming. Structural priming is the phenomenon by which a speaker is more likely to produce a specific structure after hearing or using that same form (being “primed”) in previous speech, presumably due to increased activation of this structure in the grammar (e.g., Weiner & Labov, 1983; Bock, 1986). Structural priming is attested in both experimental work and natural discourse (see Jackson, 2018 for a state of the scholarship). Experimental priming studies often involve picture description tasks, in which participants hear and/or read a sentence describing a picture, called a *prime*, then they describe another picture with another sentence, called a *target*, with the idea that participants’ production will be affected by the syntactic form of the sentence or prime they heard or saw in the previous description.

Researchers are still debating the underlying mechanisms behind structural priming. Lexicalist accounts, for example, attribute structural priming to the activation of combinatorial

nodes connected to lemmas or lexical entries, which are specified for syntactic, semantic, morphological, and phonological properties. This activation causes a speaker to be more likely to use an activated syntactic structure than an equally acceptable alternative in subsequent discourse due to the interconnected nature of combinatorial nodes in the grammar (Pickering & Branigan, 1998). This account has been supported by the well-known lexical boost effect, by which structural priming effects are stronger when there is an overlap between the prime a speaker reads, hears, or sees, and the target response, which the speaker produces or comprehends (e.g., Bernolet et al., 2013). Hartsuiker et al. (2004) propose a similar lexically-driven account of structural priming in bilingual speakers, by which the speakers' combinatorial nodes are interconnected and shared across their grammars.

On the other hand, connectionist, implicit learning accounts suggest that, during processing, speakers make predictions about subsequent discourse and are continually updating their predictions. This account explains the increased tendency to use previously-encountered structures that are weighted more heavily after the learning that takes place in processing that structure in previous discourse – for example, when a speaker encounters a less common structure, such as a passive structure, this may run counter to their expectations and affect their subsequent processing and production strategies (Chang et al., 2000, 2006; Chang, 2002). Implicit learning accounts are supported by the inverse preference effect, which refers to the tendency for priming effects to be stronger for less frequent structures due to a surprisal factor in the processor (Ferreira & Bock, 2006).

Recent studies, however, suggest that structural priming may stem from more than one processing mechanism. Short-term priming, when the participant reuses the primed structure immediately after the prime, may be the result of activation or explicit memory of structural

representations, while long-term priming, when the participant reuses the primed structure after some time between the prime and the target production, e.g., across separate experimental trials or phases, may be the result of implicit learning (e.g., Bernolet et al., 2016).

Passives have been a common target of priming studies. Weiner and Labov (1983) showed that in sociolinguistic interviews, passive utterances are significantly more common following speech in which one of the five previous utterances appears in a passive form. In a seminal experimental study on structural priming, Bock (1986) showed that L1 English-speaking adults who heard passive primes were more likely to produce passive sentences in subsequent production than when they heard active prime sentences.

Although it is not the central goal of this dissertation, with our study, we hope to contribute to the debate on the underlying mechanisms behind structural priming in adult bilingual speakers specifically. We know that structural priming is attested in both child and adult monolingual and bilingual speakers. One question that remains open, however, is what modulates priming in the L2 of bilingual speakers. Hartsuiker and Bernolet (2017) proposed an updated model of shared syntax in bilingual speakers which explains that early-stage L2ers' syntactic representations are lexically driven, connected to specific L2 lexical entries, and in this phase, L2ers' productions are based upon structures that also exist in the L1 or on imitation of L2 structures. In later stages of proficiency, representations are abstracted across items and eventually represented in an abstract nature similar to L1 representations. Under this model, abstract representations are acquired sooner for more frequent L2 items. As discussed below, some studies suggest that L2 priming is modulated by L1 experience (e.g., Jackson & Ruf, 2017) while other studies suggest that L2 priming is modulated by L2 experience and preferences only (Hurtado & Montrul, 2021; Flett et al., 2013). In our study, we aim to elucidate whether the more frequent L2 structure (the *se*-passive)

shows greater priming effects than the less frequent but overlapping L1-L2 structure (the periphrastic passive); whether priming effects are modulated by L2 proficiency; whether these patterns differ in the immediate priming phase versus the post-test in which we may see persistent priming effects; and whether persistent priming effects reflect fully, implicitly-learned structures, as has been suggested in previous work (e.g., Bernolet et al., 2013, 2016; Messenger et al., 2022, a.o.).

In what follows, we discuss studies investigating the priming of Spanish periphrastic passives in monolingual children, followed by a discussion of cross-linguistic priming, including implications of shared structural representations in bilingual systems, and within-language priming in L2 and heritage speakers.

1.6.1. Priming of Passives in Monolingual Spanish-learning Children

Gómez et al. (2009) showed that monolingual Spanish-learning children ages 4-5 could be primed to use passive forms more after periphrastic passive primes than after active primes. When they did produce passive sentences, however, they used the *se*-passive, but never the periphrastic passive, to describe pictures, despite being presented with a periphrastic passive, not a *se*-passive prime. Children in this study also used what the authors called a ‘function passive’, an ungrammatical mixed form between the *se*-passive and the periphrastic passive, shown in (16). This form was also attested in Gómez & Shimpi (2016), who found that children around age 6 could be primed to use passive forms after passive primes, but they used the *se*-passive and the ‘function passive’, rarely a periphrastic passive production. These results may suggest that 6-year-old children have truly acquired neither structure and that their productions were the results of misapplied analogy.

- (16) *El árbol se rompió por el rayo.
the tree SE break.PST.3SG by the lightning
'The tree was broken by the lightning.'

(Gámez & Shimpi, 2016, p. 216)

The 6-year-olds in this study, however, were able to produce the periphrastic passive in a semi-imitation elicitation task in which one condition involved their own repetition out loud of the periphrastic passive prime before producing their own picture description utterance, again suggesting some degree of imitation (Gámez & Shimpi, 2016). Thus, we must be cautious when interpreting priming results, as priming can sometimes induce participants to produce forms that are otherwise not attested in their natural productions.

1.6.2. Priming of Spanish Passives in Bilingual Child Speakers

Cross-linguistic priming studies suggest some degree of shared structural representations in bilingual grammars (e.g., Hartsuiker et al., 2004, Vasilyeva et al., 2010, Phillips, 2018). For example, Hartsuiker et al. (2004) showed that Spanish-English bilingual adults (L1 Spanish, L2 English) were more likely to produce a passive form when describing a picture in English after hearing a picture description in the passive form in Spanish.

Vasilyeva et al. (2010) tested bi-directional, Spanish to English and English to Spanish, cross-linguistic priming in 65 Spanish-English bilingual children ages 5;2-6;5 who spoke Spanish at home and English at school. Interestingly, they found an asymmetry: Spanish periphrastic passives primed English periphrastic passives in the child speakers of their study (as in Hartsuiker et al., 2004), but not vice versa. The authors attributed this to frequency and pragmatic effects, as periphrastic passives are significantly more frequent in English than in Spanish, so accessing the Spanish periphrastic passive construction may have been too costly even with priming, and further, may prove even more pragmatically unnatural in Spanish than in English (e.g., Berman & Slobin, 1994). Notably, the children did not produce any periphrastic passives in Spanish, but they did

produce some *se*-passives, though there was no significant effect of prime type (English active versus English passive) on their *se*-passive production.

Importantly, shared structural representations may predict better performance or stronger priming effects with structures that exist in *both* languages of bilinguals, such as the periphrastic passive, than structures that only exist in the L2/non-dominant language, such as the *se*-passive.

1.6.3. Priming in Adult Bilingual Speakers

We know that L2ers and HSs can be primed to produce structures in the L2/non-dominant language (e.g., Hurtado & Montrul, 2020), even with structures not present in the L1/dominant language (Romano, 2021) and structures that are illicit in the L2 (Phillips, 2018). On the other hand, some studies suggest that in highly proficient L2 speakers, processing in priming tasks is modulated by L2 experience only (Flett et al., 2013).

Moreover, some studies suggest that L2ers may be more susceptible to priming than NSs (but cf. Romano, 2020). Flett (2003) tested intermediate and advanced L2 Spanish speakers, along with NS controls, on the active-passive alternation in order to assess priming effects with primes that included either the same verb as the target (lexical overlap), or a different verb from the target. The results showed that participants could be primed to produce the periphrastic passive, and that, interestingly, there were more passive productions after passive primes in the L2ers compared to the NSs, especially for the advanced speakers, as shown in Table 1.5.

Table 1.5*Percentage of Passive Productions by Condition, Prime Type, and Group in Flett (2003)*

<i>Prime Type</i>	Same Verb		Different Verb	
	<i>Active</i>	<i>Passive</i>	<i>Active</i>	<i>Passive</i>
NS	3%	28%	4%	7%
Intermediate L2	4%	58%	6%	42%
Advanced L2	1%	73%	7%	33%

This suggests that L2ers may be more affected by structural priming than NSs, perhaps due to a learning effect, in that NS grammars are fixed while L2 grammars are still developing. Further, Flett notes, as discussed previously, that the periphrastic passive is relatively more common in English than Spanish, which may also contribute to the higher rates of within experiment/language priming in the L2 Spanish (L1 English) speakers.

Jackson and Ruf (2017) examined priming of fronted temporal and locative phrases in L2 German (L1 English), the former which is common in both English and German, and the latter which is licit but less common even in German. Jackson and Ruf found that their participants (intermediate L2 German speakers) were more primed with temporal than locative fronted phrases (66% vs. 34%), and that in a post-priming test phase, fronted temporal phrases were produced more frequently than in their baseline (27% in the baseline versus 48% in the post-test). With fronted locative phrases, the baseline to post-test change was minimal (0% vs. 5%). However, it is unclear whether this asymmetry is due to the fronted temporal phrase being more frequent in L1 English or more frequent in L2 German.

Given the results in Jackson and Ruf (2017), Hurtado and Montrul (2021) aimed to test L1 and L2 frequency effects with intermediate L2 Spanish speakers. They tested the priming of the periphrastic passive, which exists in English but is infrequent in Spanish, and the dative clitic

doubled construction, which does not exist in English but is common in Spanish. This comparison is similar to the one made in this study. Interestingly, they found that both structures showed similar short-term priming rates (24.78% vs. 27.68% during the priming phase of the experiment), but only the dative clitic doubled construction showed persistent priming effects in a post-priming task that did not include any primes, five minutes after the priming phase (29.23% vs. 0% passive constructions). They interpret their results to mean that short-term priming may be the result of explicit learning, i.e., analogy or imitation, while long-term priming may be the result of implicit learning. Further, similar to Flett et al. (2013), Hurtado and Montrul argue that it is the frequency of the structure in the L2, not the L1, that modulates long-term L2 priming rates. However, this difference between the two structures could have been driven by differences in syntactic complexity – passives may be harder to acquire and produce than double-object constructions, hence less easily primed. In our study, we control for this by testing two similarly complex constructions: the periphrastic passive and the *se*-passive, the latter of which, as mentioned, is more frequent in the L2.

Relatively little is known about how structural priming affects HL production. Romano (2021) tested L2 and heritage Italian speakers on five structures, four of which were only present in the target language (three types of clitic structures with restructuring and clitic left dislocations and *si*-passives), and one which was present in the L1/dominant language (Swedish) of the L2ers and HS (active SVO transitives). The results showed the NSs had a different ranking of the structures by rate of production after primes, but crucially, a similar priming effect was observed across the five structures in the L2ers and HS, i.e., they were likely to produce each of the five structures in similar proportions immediately after hearing the prime for that structure, even though only some of these were attested in their dominant language.

Regarding priming with HSs when compared to L2ers and NSs, Hurtado and Montrul (2020) conducted a priming study with all three speaker groups on clitic doubled constructions across four phases: baseline, treatment (priming and target productions of picture descriptions), an immediate post-test (five minutes after treatment), and a delayed post-test (one week after treatment). They found that all groups produced more clitic doubled constructions in the priming phase than in the baseline phase. The results are shown as percentages of target production matching the clitic doubled prime in Table 1.6. L2ers and HSs produced significantly more clitic doubled constructions, compared to their within group baselines, in the treatment and both the immediate (5 minutes later) and delayed (1 week later) post-tests.

Table 1.6

Percentage of Clitic-Doubled Constructions by Speaker and Phase (Hurtado & Montrul, 2021, p. 202)

Phase	L1	HS	L2
Baseline	55.59%	49.11%	7.91%
Treatment	69.56%	68.75%	27.68%
Immediate post-test	58.82%	62.2%	24.8%
Delayed post-test	60.99%	57.14%	16.11%

L2ers showed the greatest increase in use of these constructions from the baseline, mainly due to floor effects in this phase, i.e., they were not producing many clitic doubled constructions before treatment. HSs produced clitic doubled constructions at a similar rate to NSs, and their increase in use of this structure in the treatment and post-test phases approached native production rates. Both NSs and HSs produced more clitic doubled constructions in the treatment phase than in the baseline phase of the experiment, but NSs returned to a rate that was closer to their baseline in both post-tests. HSs and L2ers, on the other hand, showed long-term priming effects, increasing

their use of clitic doubled constructions from the baseline, to treatment, to the immediate post-test, and even to the delayed post-test.

Romano (2020) and Romano and Guijarro-Fuentes (2023) also found that HSs patterned similarly to L2ers in their knowledge and production of morphological forms in priming tasks in heritage and L2 Italian. In the 2020 study, Romano concludes that HSs show an advantage over L2ers in syntactic knowledge only but no such advantage with morphological forms, as evidenced by HSs' and L2ers' higher rates of omission of obligatory *si* clitics in Italian when compared to NSs. However, presently few studies compare HSs to L2ers in priming tasks, so it remains unclear whether HSs will always pattern with L2ers in this sort of task, or whether priming effects differ across different languages, structures, time courses, and proficiency levels.

1.6.4. Interim Summary

Overall, priming of passive structures is attested in both intra- and cross-linguistic priming, and NSs, L2ers, and HSs all show effects of structural priming, that is, their exposure to a specific syntactic form in previous discourse (or in priming trials) increases the likelihood of their using that form in subsequent production. However, immediate post-priming productions and delayed productions may tap into different learning mechanisms, viz. explicit vs. implicit learning or knowledge. We aim to contribute to this literature by testing priming in these three speaker groups, specifically in the non-dominant/L2 of our HSs and L2ers, respectively. We hope to gain insight into whether the periphrastic passive's existence (and shared abstract structural representation) in the both languages makes it a more likely prime, or if the higher frequency of the *se*-passive in the target language makes it a more effective prime. We also aim to assess whether priming patterns differ across speaker groups, immediate and post-test productions, and non-dominant language proficiency. Further, we will compare priming patterns to receptive data to assess whether

persistent priming does indeed reflect implicitly *acquired* structures, as opposed to superficial strings that mimic a deep representation. Lastly, we will inspect any non-target-like productions (i.e., errors) with passives in order to better characterize the grammars of L2 and HL speakers.

1.7. The Present Study

The goal of this study is to explore the acquisition, knowledge, and production of complex structures in adult second language speakers (L2ers) and heritage speakers (HSs), in comparison to typical Spanish-dominant native speakers (NSs). Specifically, we aim to assess performance and competence on two passive structures with similar syntactic complexity and pragmatic function: the *se*-passive, only present in Spanish, the non-dominant language (L1 of the HSs and L2 of the L2ers, respectively), and the periphrastic passive, present in both the dominant/L1 English and the non-dominant/L2 Spanish. Further, we expand on the work on passives and make a unique contribution by comparing production and receptive knowledge of the periphrastic passive and the *se*-passive in adult L2ers and HSs of Spanish.

The study consists of two experiments: a structural priming elicited production task and a timed acceptability judgment task. The structural priming experiment includes a baseline phase, a priming section consisting of primes and target productions of picture descriptions, and a post-test administered five minutes after the priming section is complete in order to assess short-term versus persistent priming effects. Our research questions and predictions are:

1. How relatively accessible are Spanish periphrastic passives and *se*-passives for L2ers and HSs in a structural priming production task? More specifically – what factors predict priming?
 - a. *Frequency in target language*. If so, we expect priming with the more frequent *se*-passive across all groups.

- b. *Shared structures*. If so, we predict priming with periphrastic passives in bilingual groups.
 - c. *Implicit acquisition*. If so, we expect accuracy in the receptive task (evidence of acquired structures) to predict production in the priming task.
2. How robust is L2ers' and HSs' knowledge of Spanish periphrastic passives and *se*-passives in a receptive task? More specifically – what predicts native-like performance in the receptive task?
- a. *Transfer* from dominant language (e.g., Schwartz & Sprouse, 1996; Lardiere, 2005, 2009). If so, we expect better performance on periphrastic passives than *se*-passives.
 - b. *Input frequency* of a structure in the L2 (e.g., Ellis, 2002). If so, we predict better performance on *se*-passives than periphrastic passives.
 - c. *Age of acquisition* (e.g., Hawkins & Chan, 1997; Hawkins et al., 2004). If so, we predict more 'native-like' performance (performing similarly to Spanish-dominant NSs) in HSs than L2ers.
 - d. *Proficiency*. If so, we expect performance in receptive task to be predicted by proficiency score in HSs and L2ers.

By comparing group performance across structures and tasks, we intend to answer some general and still open questions of the field: if L2ers and HSs produce passives in the priming experiment, suggesting structural priming effects, will they also show receptive knowledge of these structures in the acceptability judgment task? If L2ers and HSs both produce passives correctly in the production task *and* demonstrate knowledge of *both* passive structures by recognizing subject(Theme)-verb agreement errors on the AJT, at least in advanced proficiency levels, this

would suggest development of and access to these structures regardless of age of acquisition, countering No/Partial Access accounts that highlight the role of the Critical or Sensitive Period. If L2 speakers produce correct passive structures in the priming experiment but fail to recognize subject(Theme)-verb agreement errors in the AJT, while HSs do well with both, we can support the hypothesis that adult L2 representations of complex morphosyntactic structures may be more shallow, and learners may be using a general cognitive mechanism such as analogy in production, while failing to fully acquire the formal properties associated with these syntactic structures (e.g., Meisel, 1997; Ellis, 2002, 2011; Ellis & Collins, 2009; Ellis, Römer, & O'Donnell, 2016).

Differences or similarities between experimental groups have important pedagogical implications. If we find a dominant-language boost for the structure present in English, we find support for the role of positive transfer in L2 acquisition and HL maintenance. If we find that both speaker groups do well on the structure that is highly frequent, and only present in the target language, we find support for input-driven pedagogical strategies (e.g., Krashen's *Comprehensible Input Strategy*, 1982) for the L2 and the HL classroom. If neither speaker group does well on this structure, it would suggest both that L2ers need something beyond high target language frequency in the input to acquire complex structures, *and* HSs require some level of maintenance on structures only present in their HL. Lastly, if we find that only the HSs do well on the structure only present in the target language, i.e., *se*-passives, we highlight the importance of different pedagogical goals and strategies for L2ers and HSs.

CHAPTER 2: SECOND LANGUAGE LEARNERS

In this chapter, we aim to address the research questions that relate to second language learners mentioned in Chapter 1, namely: Can L2ers be primed to produce Spanish periphrastic and *se*-passives? If so, what modulates priming in the L2? We address these questions in Experiment 1, a priming task that includes three phases. If target language frequency (L2 Spanish) modulates priming (Flett et al., 2013; Hurtado & Montrul, 2021), we expect priming with the more frequent *se*-passive. If the availability of a structure in both L1 (English) and L2 modulates priming (Jackson & Ruf, 2017), we expect priming with the periphrastic passive given its availability in both English and Spanish.

Further, if L2ers produce Spanish passives in the production task, do these productions reflect learned, target-like abstract representations, as suggested in the priming literature (e.g., McDonough, 2006; Bernolet et al., 2013, 2016; Jackson & Ruf, 2017; Kaan & Chun, 2017; Messenger et al., 2022)? If so, we expect L2ers who produced passives correctly in the priming task (Experiment 1) to perform equally well in the receptive task (Experiment 2), demonstrating knowledge of subject-verb agreement with the Theme argument on passive sentences, on both passive types. If, however, ultimate attainment of complex structures not attested in the L1, i.e., the *se*-passive, is not possible, L2ers may resort to superficial, probabilistic strategies in the production task that only give the *appearance* of complete acquisition of these structures. Ultimately, we hope to shed light on whether the lack of early language experience hinders adult L2ers' access to functional features or feature bundles not instantiated in their L1, making ultimate attainment of these constructions impossible.

This chapter is organized as follows – first we provide an overview of our second language learner (L2) and Spanish-dominant native speaker (NS) populations' demographics, language

background, and proficiency scores, along with a description of the experimental methods, materials, and procedures for data collection as well as our coding procedures. Then, we review the NS and L2 results from Experiment 1, the priming task, including production patterns, statistical analyses, and qualitative analyses of production anomalies (i.e., errors and full passives). Finally, we present the results from Experiment 2, the acceptability judgment task, along with a comparison between the results of Experiments 1 and 2 and a discussion of theoretical implications.

2.1. Participants

Participants were recruited online via social media and newsletter announcements, via paper flyers on the UCLA campus and in the Los Angeles area, and via Spanish courses in the Spanish & Portuguese Department at UCLA. We collected data from 45 adult L2 speakers of Spanish with intermediate to advanced levels of proficiency (as stated in the recruitment materials). Fourteen speakers in this group were excluded for failing the control items (less than 50% of ungrammatical control items rejected), and one speaker was excluded for not knowing many of the verbs in the production task, given that we aimed to test speakers' syntactic and structural knowledge, not their lexical knowledge. This left us with 30 participants in our L2 group who completed both experiments and met the inclusion criteria. We conducted an adapted version of the Bilingual Language Profile (BLP) in Spanish in order to categorize our participants as NS, HS, or L2er, and to assess reading habits (Birdsong et al., 2012). Our L2 Spanish speakers all spoke English as their L1, they were not regularly exposed to Spanish before puberty, and they learned Spanish outside of the target language environment, i.e., in the classroom. We also collected data from 41 adult L1 Spanish-speaking participants raised in Spanish-dominant environments (NSs). Twelve of our NS participants were excluded for not completing the second

experiment ($n = 2$), failing the control items in the AJT ($n = 1$), not following the instructions in the production experiment and/or receptive experiment training trials ($n = 6$), or for not completing all trials in the first experiment ($n = 3$). None of the speakers in either group indicated extensive experience with an L3.

Table 2.1

NS and L2 Demographic Information by Speaker Group

Group	NS	L2
Number	29	30
Mean age (SD)	31.86 (9.16)	31.03 (12.23)
Age range	20-59	18-70
Gender	F: 22 M: 7	F: 19 M: 10 Prefers not to say: 1
Mean age (SD) and ranges of first exposure to Spanish	0 (0) 0	12.43 (4.07) 5-20+
Mean number of years (SD) and range spent in Spanish-speaking region	19.59 (1.27) 15-20+	2.2 (4.37) 0-19
Mean number of years (SD) and range spent in Spanish-speaking family	20+	1.4 (2.87) 0-10 ¹⁴
Mean (SD) and ranges of years of classes in Spanish	15.6 (4.38) 6-20+	7.1 (4.92) 0-19
Highest level of education completed	Less than high school: 0 High school: 2 Some university: 5 University (bachelor): 11 Some graduate school: 1 Master's: 9 Doctorate: 1	Less than high school: 0 High school: 2 Some university: 8 University (bachelor): 5 Some graduate school: 3 Master's: 7 Doctorate: 5

¹⁴ Some L2 participants indicated marrying Spanish-speaking partners verbally during the study.

As shown in Table 2.1, our L2 participants began learning Spanish at a mean of approximately 12 years old. Some L2 participants may have been exposed to Spanish in elementary school (e.g., at five years old), and our participants indicated having lived in a Spanish-dominant region an average of 2.2 years. We also note that participants who indicated more than four years in a Spanish-dominant region were either those participants who moved to Spanish-speaking regions in adulthood or those who considered Los Angeles to be a Spanish-dominant region as opposed to a target language dominant environment such as a Spanish-speaking country. Regarding education, most participants in both groups indicated having at least some university education, with 10 NSs and 12 L2ers indicating having achieved advanced degrees, making our groups' educational backgrounds rather comparable.

Table 2.2 shows participants' means, ranges, and standard deviations for BLP scores, lexical proficiency scores, and reading habits. In the BLP, a negative score indicates English language dominance, and a positive score indicates Spanish dominance, so all of our L2ers were English-dominant and all of our NSs were Spanish-dominant.

Table 2.2

NS and L2 BLP, Lexical Proficiency Scores, and Reading Habits

Group	NS	L2
Mean BLP score (Range, SD)	92.63 (31.42-140.4, 27.89)	-95.9 (-140.12-(-37.68), 22.29)
Mean lexical proficiency score (Range, SD)	.77 (.44-1, .19)	.77 (.23-1, .21)
Mean number of hours reading in Spanish weekly (Range, SD)	3.97 (1-5, 1.22)	2.5 (1-5, 1.2)

Proficiency was measured with a lexical recognition task by Fairclough (2011). This instrument was chosen because lexical proficiency is known to be a good proxy for grammatical proficiency (Polinsky, 1997, 2000, 2006) and a good measure for heritage speakers (Benmamoun et al., 2013), whose proficiency may not be reflected well in a typical cloze or reading passage proficiency measure, and because we needed a way to assess proficiency without demanding further time commitments from our participants and without compromising the results by reexposing participants to active and passive structures, subject-verb agreement (test items), or determiner-noun agreement (control items). Further, this instrument includes a calculation to account for guessing and individual response style by using the Index of Signal Detection (Beeckmans et al., 2001; Huibregtse, Admiraal, & Meara, 2002, *inter alia*). The score is calculated based on the number of hits, or correctly identified real words, and false hits, or answering *yes* to one of the 80 nonce words. Scores ranged between 0 and 1, with 1 being the highest score possible, i.e., higher scores indicate higher lexical proficiency. Our recruitment materials requested participants with intermediate to advanced level of Spanish proficiency, and we see a range of lexical proficiency scores from .23-1 in our L2 speaker group, with a mean of .77, indicating intermediate-advanced proficiency, many within the NS range.

During the BLP, participants were also asked approximately how many hours they spend reading in Spanish (and English) each week between 0 and 6 hours. L2ers indicated reading an average of about 2 hours per week in Spanish.

Regarding proficiency, participants also rated their abilities to understand, speak, read, and write Spanish (and English) on a Likert scale from 0 to 6 in the BLP. The means, ranges, and standard deviations for the L2 group's self-ratings are shown in Table 2.3.

Table 2.3*L2 Self-Assessed Proficiency by Domain*

Domain	Rating (Range, SD)
Understanding	4.97 (2-6, 1)
Speaking	4.5 (2-6, .9)
Reading	4.97 (3-6, .85)
Writing	4.83 (2-6, 1.12)

As shown in Table 2.3, our L2 participants indicated an intermediate-high proficiency, approximately 4.5 or above out of 6, across understanding, speaking, reading, and writing.

2.2. Materials and Procedure**2.2.1. Development of Stimuli for Experiments 1 and 2**

Stimuli were developed in consultation with native speakers of Peninsular and Mexican Spanish dialects with consideration for the distributional and syntactic properties discussed in Chapter 1, i.e., we used plural Themes to elicit the *se*-passive unambiguously, we only included the Theme argument given that *se*-passives do not allow for overt expression of an Agent, and Themes were always inanimate given the restriction on *se*-passives with animate objects. Verbs were selected for their degree of naturalness with each target form, i.e., whether they sound natural in the periphrastic, *se*-passive, *and* active transitive forms, as well as the possibility of depicting the target event in images for the priming task (Experiment 1). We used the preterit tense in all stimuli as it was considered the most felicitous tense/aspect to use with both passive and active sentences as assessed by native Spanish-speaking informants. The priming or treatment phase of Experiment 1 consisted of eight pseudo-randomized blocks, each with prime/target pairs for active, periphrastic, *se*-passive, and intransitive primes plus 10 comprehension questions interspersed across experimental blocks. Intransitive primes were the filler condition, consisting

of four pairs of unaccusative primes and targets and four pairs of unergative primes and targets. In the priming phase of Experiment 1, each transitive verb appeared twice: once in a prime sentence, and once in a target sentence, but never within the same experimental block. Primes and targets contained no lexical overlap in order to assess abstract representations (i.e., not to assess the lexical boost effect found in other priming studies, e.g., Bernolet et al., 2013). Baseline (pre-priming) and post-test (post-priming) stimuli (or verbs) were used only once, either in the baseline or the post-test. Further design details and example stimuli are discussed in Section 2.2.3.

The images for the priming task were carefully selected to control for two factors – aspect and agentivity. Because verbal passives are more likely to be used to describe events (rather than states) (Comrie, 1981; Postal, 2004; Gerhke & Grillo, 2009, 2010; Beas, 2013), and because we used the preterite tense, indicating that the actions depicted were telic in nature, we balanced the number of stimuli depicting ongoing versus finished events: e.g., in the baseline phase, three transitive images depicted ongoing actions while five transitive images depicted finished actions, and the post-test images were distributed in the same way. Moreover, research shows that the visibility of the agent of the verb affects passive use: an active structure is more likely to be used when an agent is visible, while a passive structure is more likely to be used if only part of the agent (e.g., hands) or no agent is visible (Rissman et al., 2019). Therefore, we balanced the number of stimuli in which there was no agent visible, only hands visible, or the whole body visible across experimental phases, e.g., in the baseline, two transitive events showed the agents' bodies, one transitive event showed the agents' hands, and five transitive events did not show the agent, and the post-test had the same distribution of image properties. This ensured that participants found the use of the passive natural in at least 75% of our transitive trials both in the pre-test and the post-test.

The stimuli for the acceptability judgment task (AJT, Experiment 2) were designed using the same verbs as the priming task (Experiment 1). Each verb appeared twice, once in a grammatical sentence, and once in an ungrammatical sentence, across different experimental blocks. The design of Experiment 2 along with example stimuli is described below in Section 2.2.4.

One female L1 Spanish speaker of Mexican Spanish living in Los Angeles recorded the audio stimuli for Experiment 1 and Experiment 2. They were asked to read each sentence in a natural manner with minimal intonation breaks. Stimuli were recorded with Audacity across three recording sessions. Stimuli were extracted manually, normalized to a sample rate of 44,100 Hz, and converted to .wav files for export and embedding into Google Slides for Experiment 1 and PCIBex (Zehr & Schwarz, 2018) for Experiment 2.

2.2.2. Procedure

Our study took place across two web-based sessions. In the first session, participants joined a research team member on Zoom. In this 45-minute session, participants first completed the lexical proficiency task (Fairclough, 2011), followed by the priming experiment (Experiment 1) in three phases, then the BLP (Birdsong et al., 2012). Participants had 10 minutes to complete the lexical proficiency task. After the proficiency task, audio recording began, and participants started the production experiment. Between the priming phase and the post-test task, participants played a non-linguistic game, PAC-MAN (Bandai Namco Entertainment Inc., 1980), for five minutes to allow for assessment of persistent priming effects afterward. The experiment concluded with the post-test task, which used the same paradigm as the baseline task but with different items. The audio recording was stopped, and participants completed the BLP. During the first session, the research team member navigated the forms, consent, images, and audio playing via Google Slides.

Experiment 2 was completed between eight and 13 days after the first and consisted of a timed acceptability judgment task (AJT) on PCibex (Zehr & Schwarz, 2018) that took approximately 15 minutes. Responses and response times were recorded in PC Ibex Farm.

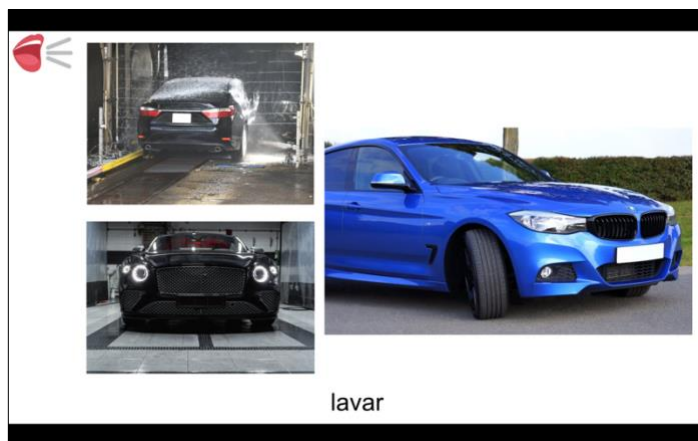
Participants were compensated for their time (approximately one hour across two sessions) with either \$15 in an electronic Amazon gift card or course credit for a Spanish course at UCLA.

2.2.3. Experiment 1: Priming Task

As mentioned, Experiment 1 consisted of three phases. The first phase of Experiment 1, which we refer to as the baseline, was a picture description task with 12 pseudo-randomized items depicting eight transitive events and four intransitive events. Participants were asked to describe what happened in the images using a form of the given verb, which appeared in the infinitive form (e.g., *lavar* ‘to wash’ in Figure 2.1¹⁵). See Appendix A for the instructions and a list of sample stimuli.

Figure 2.1

Example Stimulus from Baseline Phase in Experiment 1 for lavar ('wash')



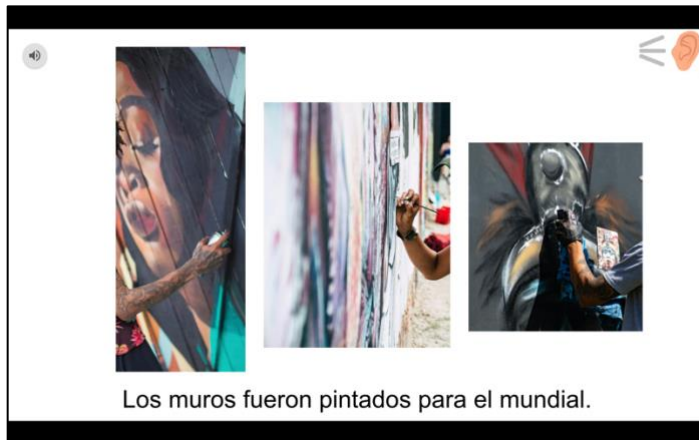
This phase, which took place before participants were exposed to primes, served to establish baseline rates of production of the target forms without any structural priming.

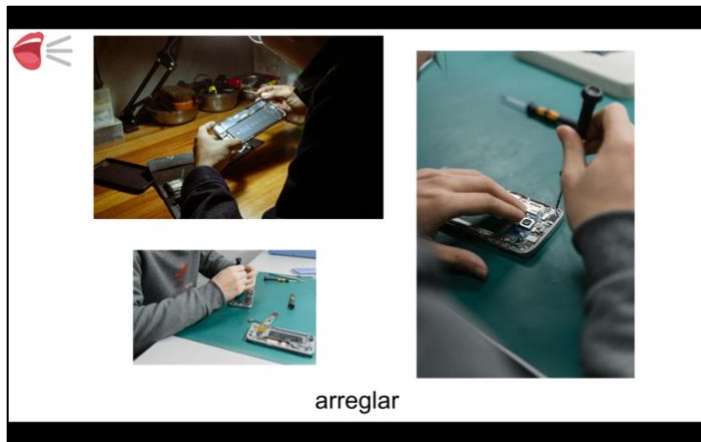
¹⁵ All images in this manuscript are opensource images that are similar to the images used in the actual experiment.

After the baseline phase, participants completed the priming phase, which consisted of 32 prime/target pairs with eight periphrastic passive primes, eight *se*-passive primes, eight active primes, and eight intransitive primes. Immediately after each prime sentence, participants described unrelated target images, again with a form of the given infinitive verb. Figure 2 shows an example prime/target pair with a periphrastic passive sentence. For the stimulus pair shown here, in the first slide shown in Figure 2.2, participants heard the sentence *Los muros fueron pintados para el mundial*, ‘The walls were painted for the World Cup’ (audio play initiated by the experimenter) while they saw the images and sentence. Immediately after the prime, the experimenter navigated to the next slide, in which participants were presented with a new set of images: in Figure 2, for example, three images of cell phones being fixed with the verb *arreglar* ‘to fix’

Figure 2.2

Example of Prime/Target Pair with Periphrastic Passive Prime



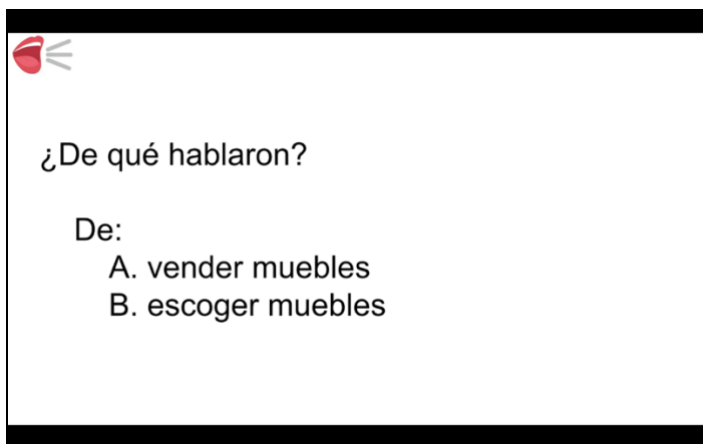


As mentioned, participants also answered 10 yes/no comprehension questions (pseudorandomized) regarding prime sentences to ensure that they were attending to the meaning of the primes and to mask the purpose of the activity. The comprehension questions addressed either the main verb or the Theme NP. Figure 3 shows an example of a prime and its corresponding comprehension question: Participants heard and saw the slide with *Los muebles fueron vendidos en el patio*, ‘The furniture were sold on the patio’ and then, in the next slide, saw and answered *¿De qué hablaron? De: A. vender muebles, B. escoger muebles*, ‘What did they talk about? About: A. selling furniture, B. choosing furniture.’

Figure 2.3

Example of Prime Stimulus and Comprehension Question



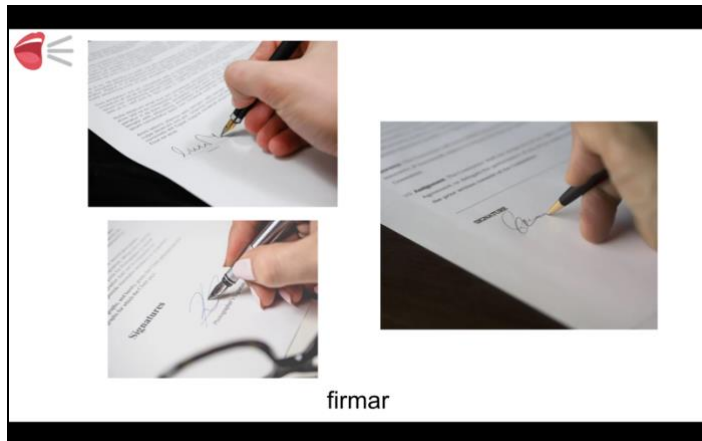


Comprehension questions were pseudo-randomized and appeared with three periphrastic primes, three *se*-passive primes, and four active primes. Across all participants in Experiment 1, there were only two inaccurate responses. The participants who gave these two responses only missed one of ten comprehension questions they were given. Therefore, no participants were excluded based on answers to comprehension questions in Experiment 1.

The post-priming phase, which we refer to as the post-test, was completed five minutes after the priming phase. As mentioned, it had the same paradigm as the baseline task but with different items in order to assess persistent priming effects. The post-test consisted of eight transitive items and four intransitive items, pseudorandomized. An example stimulus with a transitive item is below:

Figure 2.4

Post-Test Example Stimulus



Participants saw the three images of papers being signed and were given the verb *firmar* ‘to sign’.

Participants saw one of two versions of Experiment 1, which varied on which passive type they saw first (periphrastic or *se*), and which items appeared with which passive type, i.e., in Version A, *adornar* ‘to adorn’ appeared in the periphrastic passive as a prime, and in Version B, it appeared in the *se*-passive form as a prime. Filler trials were kept constant across both versions of the priming stimuli. The research team transcribed the priming experiment audio recording of participants’ responses, and data were manually coded for variables of interest, which are described below.

2.2.3.1. Data Analysis and Coding. For Experiment 1, participants’ productions were transcribed by a member of the research team across the baseline, priming, and post-test tasks. Transcriptions were coded for variables of interest including: PRODUCTION TYPE (for transitive trials, or trials of interest, ACTIVE, PERIPHRASTIC, *SE*, OTHER), PASSIVE PRODUCTION (0/1), WORD ORDER (SVO, SV, VS, etc.); for priming trials, PRIME MATCH (0/1), and, for phase comparisons, PHASE (BASELINE/POST-TEST). Below we provide examples of these categories.

In the trial that contained a set of images of cars being washed in the baseline (shown in Figure 2.1), participants gave answers such as the following:

- (1) a. Los muchachos lavaron el coche el sábado. (NS20)
the boys wash.PST.3PL the car the Saturday
‘The boys washed the car on Saturday.’
- b. Se lavaron los carros de la casa. (NS38)
SE wash.PST.3PL the cars of the house
‘The cars at this house were washed.’
- c. El carro fue lavado hoy. (NS14)
the car be.PST.3SG wash.PTCP.M.SG today
‘The car was washed today.’

In Example (1), we see an ACTIVE transitive with SVO order (1a), a *SE*-PASSIVE with VS order (1b), and a PERIPHRASTIC PASSIVE with SV order (1c). These trials were coded as BASELINE trials for the PHASE factor.

In the priming phase, participants saw a prime sentence such as (2), which is a PERIPHRASTIC prime, paired with images depicting the event.

- (2) Los muros fueron pintados para el mundial.
the walls be.PST.3PL paint.PTCP.M.PL for the World Cup
‘The walls were painted for the World Cup.’

Then, they were presented with a target trial with images of cell phones being fixed and the verb *arreglar* ‘fix’. An immediately primed response would be one such as (3a), which was coded as PERIPHRASTIC PASSIVE, PRIME MATCH, with SV order:

- (3) a. El teléfono fue arreglado por el técnico. (NS25)
the telephone be.PST.3SG fix.PTCP.M.SG by the technician
‘The phone was fixed by the technician.’
- b. Los teléfonos se arreglaron. (NS11)
the phones SE fix.PST.3PL
‘The phones were fixed.’

- c. Arreglaron los teléfonos que estaban con problemas. (NS32)
 fix.PST.3PL the phones that be.PST.3PL with problems
 ‘(They) fixed the phones that had problems.’

Sentence (3a) is an example of a full passive (with an Agentive *por*-phrase), which was quite rare in the data but will be discussed further in Section 2.3.1.4 below. Participants also produced sentences such as (3b), which was a *SE*-PASSIVE with no PRIME MATCH (0) and SV order, or (3c), an ACTIVE, no PRIME MATCH, with VO order.

As described in the previous section, the baseline (pre-priming) phase and the post-test (post-priming) phase had the same paradigm, a simple picture description task, with different stimuli. For example, in the post-test, participants saw images of a contract being signed, were given the verb *firmar* ‘to sign’, and answered:

- (4) a. El contrato fue firmado. (NS17)
 the contract be.PST.3SG sign.PTCP.M.SG
 ‘The contract was signed.’
- b. Los papeles se firmaron. (NS16)
 the papers SE sign.PST.3PL
 ‘The papers were signed.’
- c. Esa persona firmó un documento. (NS15)
 that person sign.PST.3SG a document
 ‘That person signed a document.’

These productions were coded as POST-TEST for PHASE and include a PERIPHRASTIC PASSIVE answer with SV order (4a), a *SE*-PASSIVE with SV order (4b), and an ACTIVE transitive with SVO order (4c).

As mentioned in Chapter 1, *se*-passives and impersonal *se* structures are ambiguous when the verb appears in the 3SG form.

- (5) Se firmó un contrato. (NS40)
 SE sign.PST.3SG a contract
 ‘A contract was signed.’

These productions were coded as *SE-AMBIGUOUS* and included in the counts of *SE-PASSIVES* throughout the analysis, given that we were priming *se*-passives so it is likely that any ambiguous *se* sentences were *se*-passives.

The OTHER productions included adjectival constructions, as in (6), unambiguous impersonal constructions, as in (7), psych verb constructions as in (8), and imperatives, as in (9).

- (6) Los anuncios están pegados. (NS14)
 the announcements be.PRS.3PL stick.PTCP.M.PL
 ‘The announcements were stuck.’
- (7) a. Hay que devolver libros a la biblioteca. (NS13)
 be.PRS.3SG that return.INF books to the library
 ‘Books must be returned to the library.’
- b. Es necesario pegar los avisos. (NS12)
 be.PRS.3SG necessary stick.INF the announcements
 ‘It is necessary to stick the announcements.’
- c. En la tienda de Apple se vende celulares. (LL46)
 in the store of Apple SE sell.PRS.3SG cellphones
 ‘In the Apple Store they sell cellphones.’
- (8) A una persona le gusta colgar pósters en la pared. (NS18)
 A a person LE please.PRS.3SG hang.INF posters in the wall
 ‘The person likes to hang posters on the wall.’
- (9) Ayúdame, por favor, a bajar estos libros. (HS29)
 help.IMP ME please to lower.INF these books
 ‘Please help me get these books down.’

Instances of the structures above and the like were classified as OTHER for counts and analyses.

Production anomalies (e.g., verbal agreement errors, gender agreement errors, auxiliary selection errors, instances of full periphrastic passives, instances of mixed passive forms, etc.) were coded separately and will be discussed in detail in Section 2.3.1.

In the statistical analysis below, we ran mixed effects regression models for response variables of PRODUCTION TYPE, i.e., for the SE models, 1 for *SE-PASSIVE* production, 0 for any other

production type; for the PERIPHRASTIC models, 1 for PERIPHRASTIC PASSIVE production, 0 for any other production type. Two-level categorical variables were sum coded to compare individual levels of that variable to the overall mean for that variable (e.g., PHASE). The three-level variable PRIME TYPE was coded with ACTIVE as the reference level, given that active is the unmarked condition. The structures of the models are described further in the results sections.

2.2.4. Experiment 2: Timed Acceptability Judgment Task

In Experiment 2, participants were asked to judge sentences as acceptable or not (*sí/no*) across four training trials (intransitive items), 32 target sentences with passives, and 32 control items with active and intransitive sentences (all pseudorandomized). All instructions and materials were presented in Spanish. Participants were told they would hear and read some Spanish sentences and, afterward, indicate whether the sentences were acceptable or unacceptable. Participants used their mouse to click *SÍ* ‘yes’ or *NO* ‘no’. They were told that their judgments should be from their intuitions, and they would have three seconds after the audio ended to decide. In the training trials, participants were told to pay close attention because sometimes a very small detail could make a sentence unacceptable. Training trials included intransitive verbs (two unergative, two unaccusative) in SV and VS order. Ungrammatical training trials included a number mismatch between the subject NP and an article in order to attune participants to small details without training them on the grammaticality manipulations (subject-verb agreement in the experimental items and gender agreement on nouns and articles in the control items) used in the experiment. In the ungrammatical training trials, errors appeared in red, but before beginning the experiment itself, participants were reminded that during the experiment, unlike in the training trials, the errors would not be in red. Instruction screens and sample items are shown in Appendix B.

Half of all items appeared with pre-verbal subjects (SV order) and half with post-verbal subjects (VS order). Of the target items ($n = 32$), half appeared in the periphrastic passive form, as in (10), and half in the *se*-passive, as in (11). Half of each subcondition appeared with grammatical 3PL marking (shown in 10a and 11a) and half with ungrammatical 1PL marking on the verb (shown in 10b and 11b) (as in Rodriguez, 2018).

- (10) a. Los anuncios fueron publicados en el diario la semana pasada.
 the ads BE.PST.3PL publish.PTCP.M.PL in the newspaper the week last
- b. *Los anuncios fuimos publicados en el diario la semana pasada.
 the ads BE.PST.1PL publish.PTCP.M.PL in the newspaper the week last
 ‘The ads were published in the newspaper last week.’
- (11) a. Los anuncios se publicaron en el diario la semana pasada.
 the ads SE publish.PST.3PL in the newspaper the week last
- b. *Los anuncios se publicamos en el diario la semana pasada.
 the ads SE publish.PST.1PL in the newspaper the week last
 ‘The ads were published in the newspaper last week.’

In the control items, half ($n = 16$) appear with active transitive sentences and half ($n = 16$) with intransitive sentences, again subdivided with pre- or post-verbal subjects across balanced grammatical and ungrammatical items. The grammaticality manipulation in control items included transparent gender marking, since research shows that even beginner L2ers of Spanish perform well with transparent nouns (e.g., Kirova & Camacho, 2021). The DP in question was always in adjunct position (e.g., **la segundo piso* in 12b). Only participants who performed above 50% on ungrammatical controls, correctly rejecting at least half of the ungrammatical control items, were included in the AJT and comparison analyses.

- (12) a. El novio compró las pulseras en la joyería hace dos semanas
 the fiancé buy.PST.3SG the bracelets in the.F.SG jewelry shop past two weeks
 ‘The fiancé bought the bracelets in the jewelry shop two weeks ago.’

b.*La alumna cerró la ventana en la segundo piso hace dos minutos
the student close.PST.3SG the window in the.F.SG second floor past two minutes
'The student closed the window on the second floor two minutes ago.'

Sentences were presented in the written and aural mode simultaneously to assimilate the task to the method of presentation of sentences in Experiment 1. After the unrolling text and audio, participants had three seconds to answer whether the sentence was acceptable. After three seconds, the screen moved to the next item, and missed items were coded as *timed-out* trials and excluded from analyses.

2.2.4.1. Data Analysis and Coding. In the AJT, participants selected either *sí* 'yes' (this sentence is acceptable) or *no* 'no' (this sentence is not acceptable). Responses and reaction times were recorded and extracted from PCIBex (Zehr & Schwarz, 2018). In the descriptive and statistical analysis below, we describe ACCURACY (0/1), which corresponds to correctly accepting (i.e., selecting 'yes') grammatical trials and correctly rejecting (i.e., selecting 'no') ungrammatical trials. In our mixed effects logistic regression models, we consider TYPE (PERIPHRASTIC/SE-PASSIVE), GRAMMATICALITY (GRAMMATICAL/UNGRAMMATICAL), ORDER (SV/VS) and GROUP (NS, L2). Categorical variables were sum coded to compare the mean for a given level to the overall mean of that variable across all levels, e.g., TYPE. We note here that while our stimuli included both pre-verbal and post-verbal subjects, ORDER was not a significant predictor ($p > .1$) in any models and will not be discussed further.¹⁶

2.3. Results

2.3.1. Experiment 1: Priming Task

Recall that Experiment 1, the oral production task with a structural priming paradigm, consisted of three phases. The baseline and post-test phases had 12 trials each (8 transitive, 4

¹⁶ Perhaps because the Theme argument was always inanimate in our stimuli, this cue may have given our participants a processing advantage in both the SV and VS orders.

intransitive) and the priming phase had 32 prime/target pairs (8 periphrastic, 8 se-passive, 8 intransitive, 8 active). Participants from the L2 group ($N = 30$) produced 240 transitive sentences in the baseline, 720 transitive sentences in the priming phase, and 240 transitive sentences in the post-test. The NS group ($N = 29$) produced 232 transitive sentences in the baseline, 696 transitive sentences in the priming phase, and 232 transitive sentences in the post-test phase, yielding 944 total transitive tokens in the baseline/post-test phases and 1,416 transitive tokens in the priming phase. Table 2.4 shows the raw frequencies of each production type by phase and prime for all transitive trials across both speaker groups.

Table 2.4

NS and L2 Frequency of Transitive Production Type by Phase and Group

Group	Phase	Prime	Target responses				Total
			Active	Periphrastic	Se-passive	Other	
NS	Baseline		156	10	9	57	232
	Treatment	Active	184	15	13	20	232
		Periphrastic	128	42	28	34	232
		Se-passive	137	30	36	29	232
	Post-test		138	28	42	24	232
L2	Baseline		163	14	24 ¹⁷	39	240
	Treatment	Active	200	13	17	10	240
		Periphrastic	120	54	34	32	240
		Se-passive	132	24	56	28	240
	Post-test		149	10	56	25	240

As shown in Table 2.4, the most common structure produced for transitive trials across both groups and all phases was active, which is unsurprising given that the active is the unmarked form when

¹⁷ Despite this numerical difference in se-passive productions in the baseline phase, i.e., 14 periphrastic passives versus 24 se-passives in the L2 baseline and 9 se-passives in the NS baseline, this difference is not statistically significant as assessed with a logistic regression model ($p > .8$), perhaps because many productions came from the same participant – one participant produced 8 of the se-passives in the L2 baseline.

compared to passive forms. We will show below that both speaker groups showed immediate priming effects for both structures, increasing their production of passive sentences after passive primes when compared to active primes. We will also show that both groups increased their production of *se*-passives from the baseline to the post-test, showing persistent priming effects for this structure. Before comparing speaker groups, we will address the NS data.

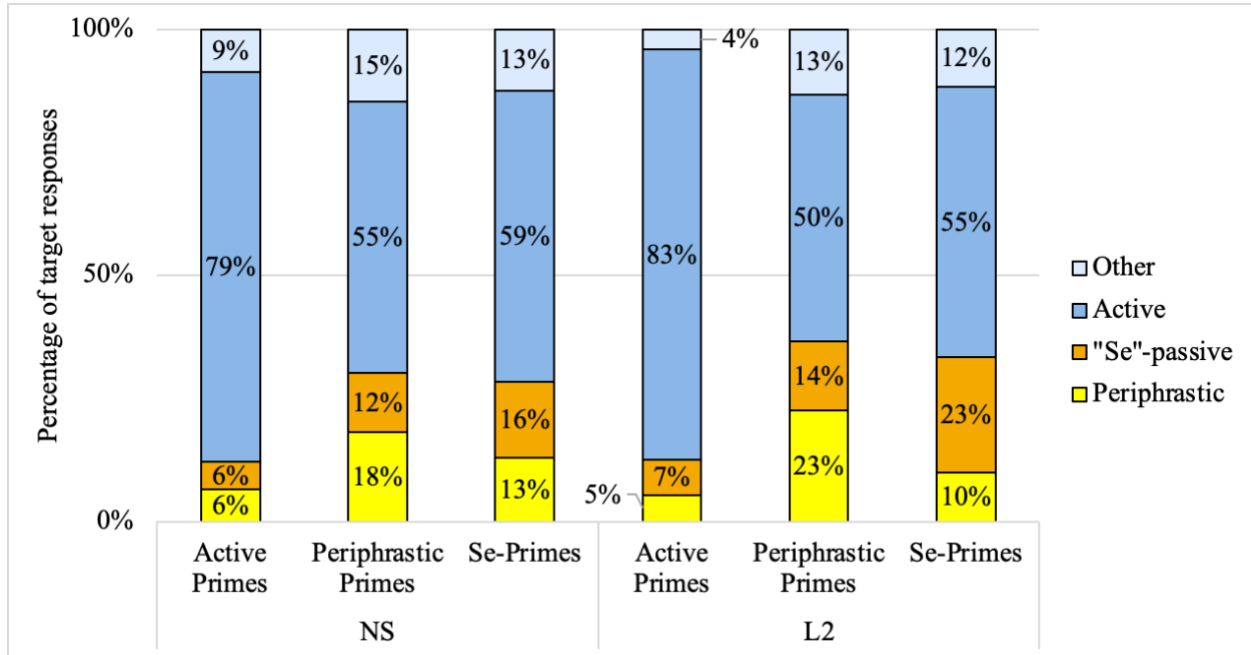
2.3.1.1. NS Baseline Data. Given that much of the data on the frequency of periphrastic and *se*-passives in Spanish is dated (e.g., Green, 1975), comes from written production (e.g., Jisa et al., 2002), or only includes an analysis of the periphrastic passive (e.g., Berman & Slobin, 1994), we also aimed to contribute to the literature by providing a baseline rate of production of periphrastic passives in comparison to *se*-passives in adult L1 Spanish speakers' oral production. We find that adult L1 Spanish speakers produced passive forms in transitive contexts approximately 8% of the time (19/232 transitive productions). Interestingly, we do not find a difference between periphrastic and *se*-passive production frequency in our baseline task, with 10 periphrastic passives and nine *se*-passives produced in the baseline. However, seven speakers produced periphrastic passives in the baseline task with two speakers producing half of these, while nine participants produced one or two *se*-passives in the baseline task. From this data, we support the notion that passives overall are quite infrequent in spoken Spanish. Regarding the differences in frequency between periphrastic and *se*-passives, we are unable to draw strong conclusions based on this data set given the small number of productions; however, it is worth noting that more *speakers* produced *se*-passives than periphrastic passives in this baseline task.

2.3.1.2. Immediate Priming Effects: Priming Phase. In the priming (or treatment) phase, L2ers produced 720 transitive sentences, 240 each after active, periphrastic, and *se*-passive primes, and NSs produced 696 transitive sentences, 232 each after active, periphrastic, and *se*-passive

primes, yielding 1,416 tokens for the priming or treatment phase analysis. Figure 2.5 shows the percentage of each production type (active, periphrastic, *se*, other) after each transitive prime type (active, periphrastic, *se*) by each speaker group (NS, L2).

Figure 2.5

NS and L2 Percentage of Production Type by Prime Type and Group



As Figure 2.5 shows, passive productions increased for both speaker groups after passive primes. We ran mixed effects logistic regressions with the lme4 package (Bates et al., 2015) in *R* (R Core Team, 2021) on the response variables PERIPHRASTIC PASSIVE production (0/1) and SE-PASSIVE production (0/1) with fixed effects for PRIME TYPE (ACTIVE, PERIPHRASTIC, *SE*) and GROUP (L2, NS), and their interaction, along with random intercepts for PARTICIPANT and VERB. As mentioned above, the two-level predictor GROUP was sum-coded while the three-level predictor prime PRIME TYPE was set with the reference level to ACTIVE. The structure of the models was as follows:

$$(13) \quad \text{Periphrastic} \sim \text{Group*PrimeType} + (1 \mid \text{Participant}) + (1 \mid \text{Verb})$$

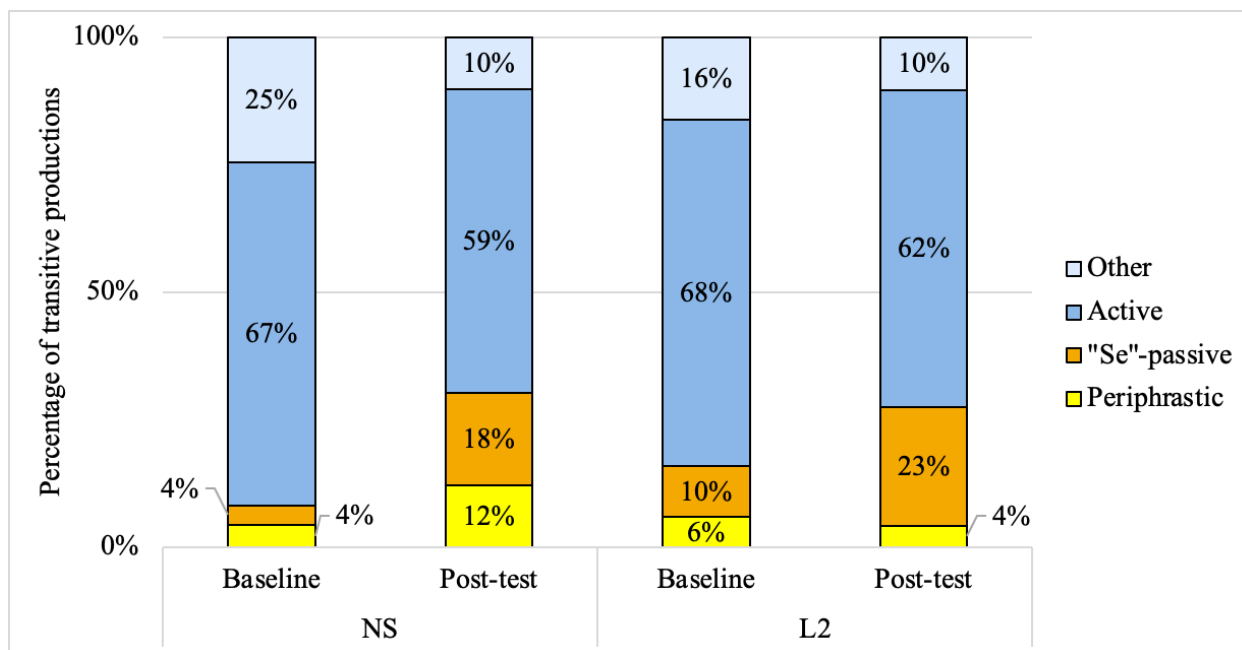
$$(14) \quad \text{Se} \sim \text{Group*PrimeType} + (1 \mid \text{Participant}) + (1 \mid \text{Verb})$$

We found significant simple effects for PRIME TYPE in both models, such that both groups were more likely to produce periphrastic passives after periphrastic primes ($\beta = 2.843$, $SE = .744$, $z = 3.821$, $p = .0001$): L2ers produced periphrastic passives just 5% of the time after active primes but 23% after periphrastic primes, and NSs produced periphrastic passives 6% of the time after active primes but 18% of the time after periphrastic primes. Both groups were also more likely to produce periphrastic passives after *se*-passive primes ($\beta = 1.935$, $SE = .745$, $z = 2.596$, $p = .009$) than after active primes, from 5% to 10% for L2ers and from 6% to 12% for NSs. We also found that both groups were more likely to produce *se*-passives after *se*-passive primes ($\beta = 1.712$, $SE = .492$, $z = 3.481$, $p = .0005$): L2ers produced *se*-passives 7% of the time after active primes but 23% of the time after *se*-passive primes, and NSs produced *se*-passives 6% of the time after active primes but 15% of the time after *se*-passive primes. Both groups were also more likely to produce *se*-passives after periphrastic primes ($\beta = 1.124$, $SE = .495$, $z = 2.269$, $p = .02$) than after active primes: from 7% to 14% for L2ers and from 6% to 12% for NSs. We found no main effects or interactions for GROUP ($p > .6$). These results suggest immediate priming effects for both passive types and comparable patterns across these two groups.

2.3.1.3. Persistent Priming Effects: Baseline and Post-Test Comparison. In order to assess persistent priming effects, we collected responses from a baseline picture description task without primes before the priming phase, as well as a post-test phase that participants completed five minutes after the priming phase. As mentioned above, L2ers produced 240 transitive sentences each phase, and NSs produced 232 transitive sentences in each phase, yielding 944 tokens for this analysis. Figure 2.6 shows the percentage of transitive production type by speaker group and phase.

Figure 2.6

NS and L2 Percentage of Production Type by Phase and Group



As Figure 2.6 shows, both NSs and L2ers increased their production of *se*-passives from baseline to post-test, showing persistent priming effects with this structure. Interestingly, while NSs show persistent priming effects with periphrastic passives, increasing their productions from 4% in the baseline to 12% in the post-test, descriptively, L2ers slightly decreased their use of periphrastic passives from the baseline to the post-test, opting to use more *se*-passives and demonstrating no persistent priming effects with periphrastic passives.

We ran mixed effects logistic regressions on the response variables PERIPHRASTIC (0/1) and *SE-PASSIVE* (0/1) with fixed effects for PHASE (BASELINE/POST-TEST) and GROUP (NS, L2) to assess persistent priming effects, i.e., how participants' productions change after the treatment phase in which they were exposed to passive primes and whether their behavior differed across groups. We included random intercepts for VERB and PARTICIPANT. The final models had the following structure:

(15) Periphrastic ~ Group*Phase + (1 | Participant) + (1 | Verb)

(16) *Se* ~ Group*Phase + (1 | Participant) + (1 | Verb)

In the periphrastic model, we found a significant interaction of GROUP and PHASE ($\beta = -0.484$, SE = 0.162, $z = -2.982$, $p = .0029$). Post hoc tests with the EMMEANS package (Lenth, 2021) with a Tukey adjustment revealed that, unlike the L2ers, the NSs significantly increased their use of periphrastic passives from the baseline to the post-test (NS BASELINE-POST-TEST comparison: $\beta = -1.451$, SE = 0.626, $z = -2.319$, $p = .02$).

Regarding the production of *se*-passives, we found a significant main effect of PHASE ($\beta = 0.891$, SE = 0.309, $z = 2.879$, $p = .004$), such that both groups increased their use of *se*-passives from the baseline to the post-test. These results show that both NSs and L2ers show persistent priming effects with the more frequent *se*-passive structure, but not with the periphrastic passive. Since L2ers did produce the structure that only exists in the L2, we analyzed production anomalies or errors with verbal material to assess their accuracy in production.

2.3.1.4. Proficiency and Reading Habits. In order to assess whether proficiency and reading habits, i.e., the number of hours spent reading Spanish weekly, affected L2ers' productions of passives in Experiment 1, we ran mixed effects logistic regressions on the L2 data only. For the priming phase, we ran mixed effects logistic regressions for the response variables PERIPHRASTIC passive production (0/1) and *SE*-PASSIVE production (0/1) with fixed effects for PRIME TYPE (ACTIVE, PERIPHRASTIC, *SE*), weekly READING HABITS in Spanish (number of hours spent reading Spanish per week, continuous, normalized), and PROFICIENCY (lexical recognition task score, continuous, normalized) with random intercepts for PARTICIPANT and VERB. PROFICIENCY and READING HABITS did not improve the model fit for the periphrastic passive model nor for the *se*-passive model as assessed with ANOVA comparisons ($p > .1$), offering no evidence of an

association between reading habits and immediate priming effects nor proficiency and immediate priming effects for the L2ers in our study.

Regarding persistent priming effects, we ran mixed effects logistic regressions on the response variables PERIPHRASTIC (0/1) and *SE-PASSIVE* (0/1) with fixed effects for PHASE (BASELINE/POST-TEST) and PROFICIENCY (lexical recognition task score, continuous, normalized) with random intercepts for PARTICIPANT and VERB. In the periphrastic model, PROFICIENCY did not improve the model fit as assessed with an ANOVA comparison ($p > 0.1$). In the *se*-model, we found main effects for PHASE and PROFICIENCY such that L2 participants produced more *se*-passives in the post-test than in the baseline ($\beta = 1.014$, $SE = 0.408$, $z = 2.487$, $p = .013$), and L2 participants with higher proficiency scores marginally produced more *se*-passives than L2ers with lower proficiency scores ($\beta = 1.279$, $SE = 0.607$, $z = 2.108$, $p = .035$). We found no interaction between PHASE and PROFICIENCY, which tells us that L2ers' productions of *se*-passives overall were affected by proficiency, but their persistent priming effects were not modulated by proficiency, as has been suggested in other priming studies (Flett, 2003; Bernolet et al., 2013; Jackson & Ruf, 2017).

2.3.1.5. Production Errors. In order to assess participants' accuracy in production, we coded certain productions as anomalies. We only found one instance of a verb form error in the NS data, shown in (17) which we attribute to performance issues:

- (17) Las laptops fueron devolvidas* a su lugar. (NS27)
the.F laptops be.PST.3PL return.PTCP.F.SG to their place
'The laptops were returned to their place.'

Table 2.5 shows the type of errors produced by L2 participants in the verbal domain by phase. There were 13¹⁸ productions with errors in the verbal domain in the baseline and post-test phases

¹⁸ One of these sentences had both a participial agreement error and an extraneous *por*.

(error rate: 2.2%) and 21 in the priming phase (error rate: 3.1%). These error rates are remarkably low, which shows that L2ers are quite successful in producing Spanish passives.

Table 2.5

*L2 Error Types by Phase*¹⁹

Error Type	Example	Phase: Count
Verb Form Error	El carro se está laviendo* enfrente de la casa. (Target: lavando)	Baseline: 2 Priming: 4
Extraneous ‘por’	Un nuevo edificio está construido por los arquitectos y los obreros. El libro se está componiendo por un conductor.	Baseline: 1 Priming: 2 Post-test: 2
Participial Error	El documento está editando. (Target: editado)	Baseline: 3
Participial Agreement Error	Los documentos están firmado. (Target: firmados) La puerta está abierto. (Target: abierta)	Baseline: 2 ²⁰ Priming: 11 Post-test: 2
Sprinkled <i>Se</i>	En el día de fiesta, la gente se celebra el triunfo. (Target: Algo ha destruido las calles.)	Priming: 5 Post-test: 2

Although it is impossible to know what the participants intended to say each time, making error categorization challenging at times, we defaulted on giving them the benefit of the doubt. That is, if they produced a sentence with a Theme-Verb order and no clitic *se*, we classified it as a correct production because focalized constructions of this sort are grammatical in Spanish. However, we recognize that it is *possible* that these were in fact sentences missing *se*.

We also note here that L2ers produced an extraneous *se*, which we refer to as *Sprinkled Se*, in which they produce a full active sentence with a pronounced Agent argument, an adjectival sentence, or an unergative sentence with the clitic *se*. These productions of *se* are inappropriate in

¹⁹ For clarity, false starts and fillers such as ‘ehm’ and ‘uhm’ were not included in the transcriptions for this table.

²⁰ Ten of these 15 participial agreement errors were produced by the same participant, LL23, who does not seem to have acquired this morphological feature.

these contexts, but L2ers seem to ‘sprinkle’ it in for reasons we will speculate about in the Chapter 4. We see another example of *Sprinkled Se* in (18):

- (18) El hombre se riega las plantas.
 the man SE water.PRS.3SG the plants
 ‘The man (*SE) waters the plants.’

In (18), the participant produces the Agent DP *el hombre* ‘the man’ but also uses *se*, which does not correspond to an argument or function in this sentence. This suggests that L2ers may not be accessing the full structure of *se*-passives but rather are being primed with the clitic itself. It is important to also note that in our visual stimuli, both Themes and Agents (when there was an Agent argument visible) were plural. Thus, we cannot rule out the possibility that L2ers may have been actually analyzing the unpronounced Agent argument as the syntactic subject and “sprinkling” *se*. To explore this further, we conducted Experiment 2, a timed acceptability judgment task (AJT) to assess L2ers’ receptive knowledge of Spanish periphrastic and *se*-passives.

2.3.1.6. Full Passives. As mentioned in Chapter 1, full long passives, or the periphrastic passive with an Agentive *por*-phrase, are late-acquired and exceedingly rare (Berman & Slobin, 1994). In our NS group, three participants produced six full passives in the baseline ($n = 2$) and post-test ($n = 4$) phases, and in our L2 group, one participant produced one full passive in the post-test phase. For example,

- (19) Los vinos han sido seleccionados por el cliente. (NS36)
 the wines have.PRS.3PL be.PTCP.M.SG select.PTCP.M.PL by the client
 ‘The wines have been selected by the client.’
- (20) El mejor vino fue seleccionado por las mujeres. (LL32)
 the best wine be.PST.3SG select.PTCP.M.SG by the women
 ‘The best wine was selected by the women.’

Full passives account for two of ten (20%) periphrastic passive responses in the baseline phase for NSs and four of 28 (14%) periphrastic passive responses in the post-test phase for NSs. In the L2

data, the one full passive in the post-test phase accounts for one of ten (10%) periphrastic passive responses in the post-test phase.

In the priming phase, three NS participants produced four full passives. In our L2 group, three participants produced five full passives in the priming phase, for example:

(21) Los zapatos fueron arruinados por el perro. (NS22)
the shoes be.PST.3PL ruin.PTCP.M.PL by the dog
'The shoes were ruined by the dog.'

(22) Los tacones fueron arruinados por el perro. (LL27)
the high heels be.PST.3PL ruin.PTCP.M.PL by the dog
'The high heels were ruined by the dog.'

Full passives account for four of 87 (4.6%) periphrastic passive responses in the priming phase for NSs, and five of 91 (5.5%) periphrastic passive responses in the priming phase for L2ers. Importantly, there were no full passive primes presented to participants at any time.

2.3.1.7. Participants. While our regression models account for individual variation with random intercepts included for PARTICIPANT, we want to explore how many participants did *not* produce passives by phase. In Table 2.6, we see how many participants did not produce passives by type and phase. In the All Phases section, we see participants who produced no passives (by type) across the whole experiment. We only had one L2 participant and one NS participant who produced no passives across any phases, but seven L2ers produced no periphrastic passives throughout the experiment and three L2ers produced no *se*-passives throughout the experiment. Then we see the breakdown of participants who produced no passives by type and phase. We can also see that only two participants from each group did not produce any passives in the priming phase.

Table 2.6*Number of L2 Participants Who Did Not Produce Passives by Type and Phase*

Phase	Passive Type	Number of Participants	
		NS	L2
All Phases	No Periphrastic Passives	1	7
	No <i>Se</i> -passives	1	3
	No Passives	1	1
Priming Phase	No Periphrastic Passives	9	7
	No <i>Se</i> -passives	6	4
	No Passives	2	2
Baseline	No Periphrastic Passives	21	20
	No <i>Se</i> -passives	20	18
	No Passives	16	15
Post-test	No Periphrastic Passives	18	22
	No <i>Se</i> -passives	9	10
	No Passives	3	8

As expected, approximately half of each group produced no passives in the baseline phase, but more than two thirds of each group produced passives of some type in the post-test.

2.3.2. Experiment 2: Timed Acceptability Judgment Task

Experiment 2 was a timed Acceptability Judgment Task (AJT) with 4 training trials, 32 test items (with periphrastic and *se*-passives), and 32 control items (with active transitive and intransitive sentences). As mentioned, only participants who performed above chance on the control items (correctly rejecting at least 50% of ungrammatical control items) were included in the analysis, which, as mentioned above, resulted in the exclusion of one NS and 14 L2 participants. Participants had three seconds to respond to the sentence, and after three seconds, the

screen moved to the next trial and the response was recorded as *timed-out*. In Table 2.7 we include the number of trials on which participants ran out of time by condition and speaker group.

Table 2.7

NS and L2 Number of Timed-Out Trials by Group and Condition (Type and Grammaticality)

	Target				Control				Totals
	<i>Periphrastic</i>		<i>Se</i>		<i>Active</i>		<i>Intransitive</i>		
	<i>G</i>	<i>U</i>	<i>G</i>	<i>U</i>	<i>G</i>	<i>U</i>	<i>G</i>	<i>U</i>	
NS	11	4	14	0	10	0	7	7	53
L2	16	7	6	10	14	6	7	4	70
Totals	27	11	20	10	24	6	14	11	123
Total Target Trial Time Outs				68	Total Control Trial Time Outs				55

In the L2 group, the average number of total timed-out trials per participant was 2.33/64 (SD: 2.04, Range: 0-9), with the average number of timed-out target trials (periphrastic and *se*-passive) being 1.3/32 (SD:1.29, Range: 0-5). No L2 participant timed out on more than three trials of the same subcondition (e.g., *se*-passive, grammatical). In the NS group, the average number of total timed-out trials per participant was 1.83/64 (SD: 1.34, Range: 0-7), and the average number of timed-out target trials was 1/32 (SD: 1.04, Range: 0-5). No NS participant timed out on more than four trials of the same subcondition – in fact, only one NS participant missed more than three trials of the same condition. Regarding target trials (trials with passives), timed-out trials account for 68 of 1,888 trials, or 3.6%.

There is a general trend to run out of time on more grammatical items, which could suggest that participants were trying to find an error that was not present. However, because Experiment 2 was web-based and performed on participants’ own time and in their own space, we remain agnostic about the informative nature of the types of missed trials by condition. While it is possible

that participants were running out of time on the trials that they found more difficult in some way, it is also possible that participants were distracted by external factors. Therefore, we do not draw any conclusions about the timed-out trials, and these trials were excluded from the analysis following field conventions.

Table 2.8 shows the mean accuracy scores and standard deviations for Experiment 2 by structure type and grammaticality for the NSs and the L2ers.

Table 2.8

NS and L2 Mean Accuracy Scores (SD) for Experiment 2 by Type, Grammaticality, and Group

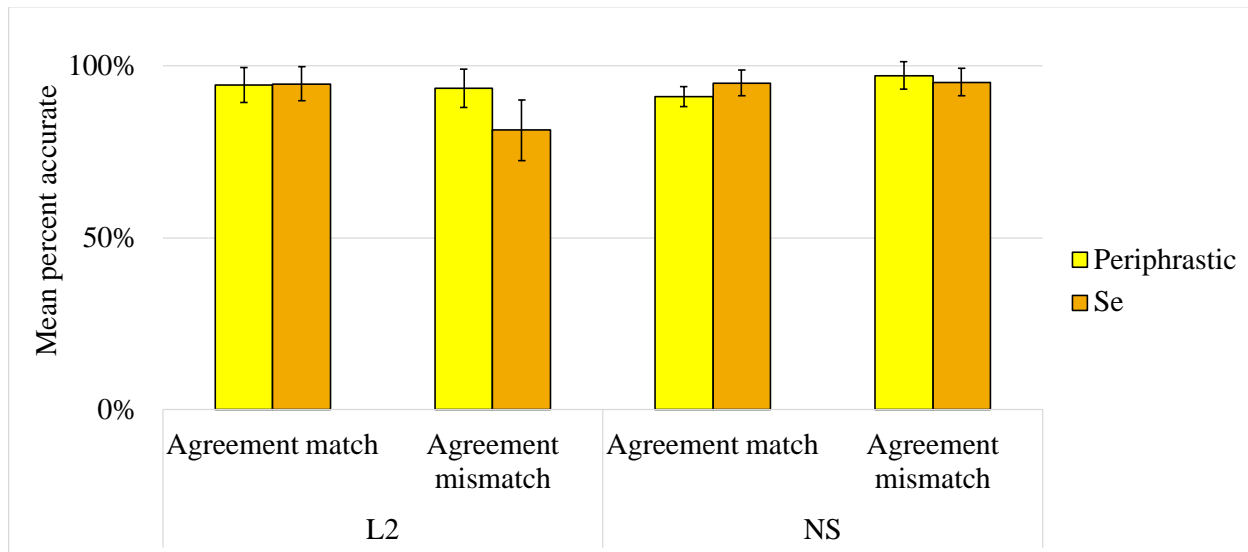
	NS		L2	
	Periphrastic	<i>Se</i> -passive	Periphrastic	<i>Se</i> -passive
Grammatical	91% (28.8%)	95.41% (21%)	94.6% (22.6%)	95.3% (21.2%)
Ungrammatical	96.93% (17.3%)	95.26% (21.3%)	89.6% (30.5%)	78.3% (41.3%)

L2ers perform quite well on periphrastic passives, and grammatical trials overall. This result is unsurprising given that the correct answer to grammatical trials was ‘yes’ together with the known ‘yes’-bias in L2 acceptability judgments (Orfitelli & Grüter, 2013; Polinsky, 2018). However, we do see a difference in L2 accuracy scores in the ungrammatical *se*-passive condition.

Figure 2.7 shows the mean accuracy scores and standard errors for the L2ers and NSs by passive type and grammaticality (agreement match = grammatical and agreement mismatch = ungrammatical).

Figure 2.7

Mean Accuracy Score by Group, Type, and Grammaticality



We ran a mixed effects logistic regression model to assess participants' accuracy scores by group and condition with the following structure:

$$(23) \quad \text{Accuracy} \sim \text{Group} * \text{Type} * \text{Grammaticality} + (1 | \text{Participant}) + (1 | \text{Verb})$$

The response variable ACCURACY is binary (0/1), with '1' corresponding to correctly accepting grammatical trials and correctly rejecting ungrammatical trials. The fixed effects include GROUP (NS/L2), TYPE (PERIPHRASTIC/SE), and GRAMMATICALITY (GRAMMATICAL/UNGRAMMATICAL). We also included random intercepts for PARTICIPANT and VERB. Categorical variables were sum-coded to compare each level to the overall mean for that variable (e.g., GRAMMATICALITY). We found a marginally significant main effect of GRAMMATICALITY ($\beta = -0.22$, SE = .108, $z = -2.044$, $p = .04$) such that participants were less accurate with ungrammatical trials than with grammatical trials. We also found interactions for GROUP and GRAMMATICALITY ($\beta = -.553$, SE = .108, $z = -4.83$, $p < .00001$) and TYPE and GRAMMATICALITY ($\beta = -.273$, SE = .109, $z = -2.5$, $p = .012$), such that L2ers were less accurate with ungrammatical trials than NSs and, overall, ungrammatical *se* trials had the lowest accuracy scores. Post hoc pairwise comparisons with a Tukey adjustment with the EMMEANS package (Lenth, 2021) reveal that L2ers were significantly more accurate with grammatical than ungrammatical *se*-passives ($\beta = 1.913$, SE = .389, $z = 4.916$, $p < .0001$) and,

crucially, less accurate with ungrammatical *se*-passives than ungrammatical periphrastic passives ($\beta = -0.877$, $SE = .311$, $z = -2.815$, $p = .025$).

2.3.2.1. Proficiency and Reading Habits. We wanted to assess whether proficiency and reading habits (number of hours of reading in Spanish per week) predicted performance for L2ers in the receptive task. We ran mixed effects logistic regressions on the subset L2 data with the response variable ACCURACY, fixed effects for TYPE, GRAMMATICALITY, READING HABITS (continuous, normalized), and LEXICAL PROFICIENCY (continuous, normalized) with random intercepts for PARTICIPANT and VERB. We found that the READING HABITS variable did not improve the model fit, nor was it a better predictor than PROFICIENCY, as assessed with ANOVA comparisons ($p > .1$), so we will not discuss it further. The final model had the following structure:

$$(25) \quad \text{Accuracy} \sim \text{Type} * \text{Grammaticality} * \text{Lexical Proficiency} + (1 | \text{Participant}) + (1 | \text{Verb})$$

We found significant main effects for GRAMMATICALITY ($\beta = -.85$, $SE = .17$, $z = -5.001$, $p < .00001$), as expected, such that L2ers were less accurate with ungrammatical trials than grammatical trials; and TYPE ($\beta = -.372$, $SE = .167$, $z = -2.228$, $p = .026$), as expected, such that L2ers were less accurate with *se*-passives than periphrastic passives. We also found an interaction between GRAMMATICALITY and PROFICIENCY ($\beta = .902$, $SE = .184$, $z = 4.907$, $p < .00001$) such that those participants with higher proficiency scores were more accurate on ungrammatical trials than participants with lower proficiency scores. But crucially, no main effect of PROFICIENCY or interaction between PROFICIENCY, TYPE, and GRAMMATICALITY. Therefore, L2ers's lower performance on ungrammatical *se*-passives cannot be attributed to those with lower proficiency.

2.3.3. *Se*-passive Performance in Experiment 1 and Experiment 2

Since L2ers successfully produce *se*-passives in the production task but show some instability in their knowledge of *se*-passives in the receptive task, we wanted to assess whether the

same speakers who were producing *se*-passives in the post-priming phase (showing persistent priming effects) were the speakers with higher accuracy scores in the AJT, i.e., whether productions are higher in L2ers who have demonstrated robust grammatical knowledge of this structure. The condition in which L2ers did not perform at ceiling was on the ungrammatical *se*-passives as shown in Section 2.3.2 above. We ran mixed effects logistic regression models on the response variable *se*-passive production in the baseline (model 1) and the post-test (model 2) with fixed effects for mean accuracy on ungrammatical *se*-passives in Experiment 2. We found no main effects (model 1: $p = .77$; model 2: $p = .1$) such that accuracy on ungrammatical *se*-passives in Experiment 2 did not predict L2ers' productions of *se*-passives in the baseline or post-test phases of Experiment 1. There were participants who produced zero *se*-passives in the post-test but showed high accuracy scores ($> 70\%$ accurate) in the receptive task ($n = 7$), and vice versa, i.e., two participants produced two *se*-passives each correctly in the post-test but scored less than 30% accuracy on the ungrammatical *se*-passives in the AJT. These results suggest that while L2ers' target-like productions (in a priming task and otherwise) may generally reflect target-like grammars, it is also possible for L2ers to produce certain structures correctly without having stable, native-like grammatical representations of them. Thus, production results alone should be taken with caution and should always be compared to another measure, such as a receptive task.

2.4. Discussion

In this chapter, we aimed to address whether L2ers can be primed to produce both Spanish passives, which factors modulate priming in the L2, how priming and production patterns compare to L1 speakers, and L2 performance on the same structures in a receptive task. We found that both L1 and L2 speakers are susceptible to immediate priming effects for both Spanish passives, increasing their production of both periphrastic and *se*-passives after both periphrastic and *se*-

passive primes compared to after active primes, to a similar extent across groups. Interestingly, both passives prime both passive productions. Work with crosslinguistic structural priming in Greek suggests that similar structures may share representations in bilingual systems even when their surface structure differs, e.g., the Greek passive primed the English passive in adult L1 Greek - L2 English speakers despite the Greek passive being marked morphologically and realized as a single word, in contrast to the English passive which is realized periphrastically with the auxiliary *to be* plus participle (Kotzochampou & Chondrogianni, 2022). Though this work refers to shared structural representations in bilingual systems, we can extrapolate to within-language representations: it is plausible that the Spanish periphrastic passive and the *se*-passive representations share some overlap or connection, which would explain the tendency for the periphrastic passive to also prime the *se*-passive and vice versa. While this could be attributed to cumulative priming effects (e.g., Ruf, 2011; Shin & Christianson, 2012; Jackson & Ruf, 2017), if cumulative priming were the source of both passive types priming both passive productions, we would also expect an effect in the active prime condition, such that participants would increase their use of passives even after active primes when compared to the baseline condition. However, this was not the case: NSs produced periphrastic and *se*-passives in the baseline phase 4% of the time and after active primes, 6% of the time, and L2ers produced periphrastic passives 6% and *se*-passives 10% of the time in the baseline but 5% and 7% of the time, respectively, after active primes in the priming phase. Interestingly, this occurred in both the NS, the L2, and (as we will show in Ch. 3), the HS data, which does suggest some level of abstraction and connection in the representation of Spanish passive structures in their grammars.

Notably, we find that persistent priming effects seem to be modulated by structure frequency in the target language, such that only the more frequent L2 structure, the *se*-passive,

shows persistent priming effects, despite the lack of an equivalent structure in the L1. These results support the notion that priming the L2 is not modulated by L1 input frequency but rather, in proficient L2 speakers, structural preferences are language specific, modulated by the target language (Flett et al., 2013; Hurtado & Montrul, 2021).

In our receptive task, we aimed to probe L2ers' receptive knowledge of these structures to elucidate whether their productions of passive structures in a priming task do indeed reflect stable, fully-acquired abstract representations of these structures. As mentioned in Chapter 1, while experiments with periphrastic passives generally assess interpretation via the possibility of Agent-Theme reversal, the Agent argument is never overtly expressed in the *se*-passive, so testing the interpretation of semantic roles is not an option for probing the representation of *se*-passives. We chose to test verbal agreement on the periphrastic and *se*-passive given that a speaker would have to represent the Theme argument in a passive as the syntactic subject, triggering agreement on the verb, to accurately derive these structures.

Results from the AJT revealed that L2ers performed at ceiling with the control items (gender agreement in the nominal domain) and the periphrastic passive (verbal agreement). Given how infrequent this structure is in Spanish (Green, 1975; Jisa et al., 2002; Berman & Slobin, 1994; a.o.), we are led to believe that L2ers benefited from positive transfer. Specifically, since L2ers can map the Spanish periphrastic passive directly onto the analogous structure in L1 English, they are able to produce and comprehend these structures accurately. In contrast to their performance on the periphrastic passive, the L2ers did not reject ungrammatical items in the *se*-passive condition in the AJT to a similar extent, performing worse on this structure, contra some usage-based accounts, which predict better performance on the higher frequency structure, the *se*-passive (Ellis, 2002, et seq.).

Although accurate productions (in a structural priming task or otherwise) may be generally the product of target-like abstract representations in L2 populations, the fact that some participants successfully produced *se*-passives in Experiment 1 but had below-chance accuracy scores on *se*-passives in Experiment 2, and vice versa, suggests that it is possible for L2ers to produce structures that they do not have a full, stable representation for, counter to the claims that primed productions necessarily imply those structures have been acquired (e.g., Bernolet et al., 2013, 2016; Messenger et al., 2022).

Lastly, proficiency score did not predict L2er's low performance on *se*-passives in the AJT, and as a group, the L2ers in our study did not converge with NSs on ungrammatical *se*-passives. Thus, our results are most in line with Partial Access accounts that predict insurmountable difficulties with L2 grammatical features and structures not instantiated in the L1, even in speakers who have arguably reached the ultimate state of their L2, due to the critical role of age of acquisition. Under this hypothesis, some participants' native-like performance with *se*-passives would be an artifact of domain-general cognitive abilities. However, given that lexical proficiency is only one domain of proficiency, and the relatively small size of our data set, our results do not preclude the possibility of eventual acquisition of the full structure of the *se*-passive (or other features not instantiated in the L1) in adult L2ers.

In order to shed more light on the question of whether L2ers struggle with *se*-passives (when compared to periphrastic passives) because of age of acquisition, as predicted by Partial Access accounts, or other factors, such as general difficulty with functional morphology not present in the dominant language, in Chapter 3, we discuss the results from the same two experiments with another population of English-dominant bilinguals: heritage speakers. If L2ers' difficulties with *se*-passives stem from English language dominance, we expect proficiency-

matched, English-dominant HSs to also struggle with *se*-passives. If, however, age of acquisition is the main factor in L2ers' variable acquisition of this structure, the HS group should display more native-like performance with *se*-passives, given their early exposure to Spanish in the home.

CHAPTER 3: HERITAGE SPEAKERS

In this chapter, we aim to address these questions: (1) Can HSs (like L2ers) be primed to produce periphrastic and/or *se*-passives in a production task? (2) If so, are priming effects persistent for *se*-passives only, like in our L2 population? In other words, does target language frequency predict persistent priming effects in HSs? (3) If, like L2ers, HSs successfully produce Spanish passives in a production task, do these productions reflect target-like, stably-acquired and maintained structures as evidenced in a receptive task? (4) Will HSs converge with NSs on these tasks, suggesting an early age of exposure advantage, or will they perform differently than NSs, suggesting that English language dominance trumps any early language exposure advantage for these structures and tasks? If HSs converge with NSs, producing both passives and performing at ceiling in the receptive task across passive types, we find a difference between HSs and L2ers, which lends support to Partial Access accounts of second language acquisition that predict that after an optimal window of acquisition (i.e., after the Sensitive Period), for adult L2ers, functional features not present in the L1 are particularly impacted and generally not acquirable (e.g. Hawkins & Chan, 1997; Hawkins et al., 2004). If HSs perform differently than NSs, we could conclude that English dominance is a significant predictor of performance with passives in Spanish, suggesting that functional categories not instantiated in their dominant language are particularly susceptible to negative dominant-language influence or attrition. Further, previous studies have found that HSs outperform L2ers in production tasks, and L2ers outperform HSs in written tasks (e.g., Sánchez-Walker & Montrul, 2021; Montrul, 2016; Montrul et al, 2014; Montrul et al., 2008, a.o). Do we find the same patterns with these complex structures, i.e., the periphrastic passive and the *se*-passive? The answers to these questions contribute to our knowledge of the role of age of acquisition in ultimate attainment of a language, as well as questions of pedagogical strategies for

teaching HSs and L2ers.

First, we give an overview of the heritage speaker (HS) and Spanish-dominant native speakers (NS) populations. The materials and procedure were the same as Ch. 2, found in Section 2.2 and briefly reiterated in Section 3.2 below. Next, we discuss the results and analysis from Experiment 1 for these groups, along with an overview of the types of production anomalies we found in this experiment in the HS group. Experiment 2 results and analysis follows. We finish with a discussion of the results in the context of heritage language acquisition (HLA) and in comparison to the results from our L2 population described in Chapter 2.

3.1. Participants

Participants were recruited in the same manner and timeframe as L2 participants described in Chapter 2. We assessed speaker group membership with the BLP (Birdsong et al., 2012). Our criteria for classification as a heritage speaker included: being exposed to Spanish before the age of 5²¹, indicating a majority of years spent in a Spanish-speaking family, indicating a small number of years in a Spanish-speaking region, and/or indicating a small number of years of classes in Spanish. We collected data from 40 heritage speaker participants (HSs). Ten of our HS participants were excluded from our analysis for not completing the second experiment ($n = 5$); for failing the control items in the AJT ($n = 4$); or for producing finite forms only in the production task ($n = 1$). This left us with 30 HSs and 29 NSs in our final analysis.

As mentioned in Chapter 1, heritage speakers (HSs) are a particular subset of native speakers whose home language differs from the dominant language of the region in which they

²¹ In two cases, participants in the HS group answered the question ‘At what age did you begin learning Spanish?’ with a number other than zero (the expected answer for this group). However, based on their answers to other questions, they did not indicate experience with English, Spanish, or any other language before these ages, indicated that their families spoke all or majority Spanish, and indicated not having received schooling in Spanish. It is impossible to know what participants’ reasoning is *a priori*, but it appears that these participants interpreted this question to be asking about literacy/reading.

live (Wiley & Valdés, 2000; Rothman, 2009; Benmamoun et al., 2013, a.o.). In our study, the HSs were raised in a home where Spanish is spoken, but in a region where English is the dominant language, e.g., the United States. In distinguishing the HSs from the L2ers, we assessed their answers to the questions about age of first learning Spanish (for HSs, generally 5 years or younger and for L2ers, generally 12 years or older) and number of years spent in a Spanish-speaking family (for HSs, more than 16 years and for L2ers, generally 0 years, always fewer than 10 years).

Table 3.1*Demographic Information by Speaker Group - All Groups*

Group	NS	HS	L2
Number	29	30	30
Mean age (SD)	31.86 (9.16)	23.07 (6.11)	31.03 (12.23)
Age range	20-59	18-43	18-70
Gender	F: 22 M: 7	F: 24 M: 6	F: 19 M: 10 Prefers not to say: 1
Mean age (SD) and ranges of first exposure to Spanish²²	0 (0) 0	.5 (2.11) (0-11) ²³	12.43 (4.07) 5-20+
Mean number of years (SD) and range spent in Spanish-speaking region	19.59 (1.27) 15-20+	2.6 (4.78) 0-19	2.2 (4.37) 0-19
Mean number of years (SD) and range spent in Spanish-speaking family	20+ (0) 20+	19.5 (0.97) 16-20+	1.4 (2.87) 0-10
Mean (SD) and ranges of years of classes in Spanish	15.6 (4.38) 6-20+	4.43 (3.67)	7.1 (4.92) 0-19
Highest level of education completed	Less than high school: 0 High school: 2 Some university: 5 University (bachelor): 11 Some graduate school: 1 Master's: 9 Doctorate: 1	Less than high school: 0 High school: 2 Some university: 17 University (bachelor): 5 Some graduate school: 2 Master's: 4 Doctorate: 0	Less than high school: 0 High school: 2 Some university: 8 University (bachelor): 5 Some graduate school: 3 Master's: 7 Doctorate: 5

Table 3.2 shows the mean, range, and standard deviations for the language dominance scores from the BLP. A numerically negative score indicates that, according to the BLP, the participant is dominant in English, while a positive score indicates Spanish dominance. While the NS group is strongly Spanish-dominant (indicated by a positive BLP score), the HS group is

²² First exposure does not necessarily indicate continued, regular exposure.

²³ Only two HS participants indicated beginning to learn Spanish not from birth, and for both speakers they indicated having no exposure to *any* language before this age, suggesting issues with their interpretation of the question.

mostly English-dominant. Three participants from the HS group received scores that indicated Spanish dominance: 11.98, 18.89, and 26.79. Due to the subjective nature of some of the BLP questions (e.g., some participants interpreted ‘Spanish-speaking region’ to include Southern California as opposed to a Spanish-speaking country; some participants indicated not beginning to learn any language until age 5; etc.), we remain confident that these three participants still fall under the (heterogenous) HS category. We also note here that the BLP does not account for these differing interpretations of these questions, nor does it account for participants’ participation in immersion school programs not in the target language region (e.g., participation in a Spanish immersion program is interpreted as years of classes in Spanish, though the schooling may not be conducted entirely in Spanish, nor is the immersion school in a Spanish-speaking region). While the BLP is useful as a starting point for assessing group membership and language dominance, there is no one perfect way to capture the complexities of a multilingual linguistic profile, particularly in the variable cases of HLA.

Table 3.2*NS and HS BLP, Lexical Proficiency, Reading Habits, and Dialect*

Group	NS	HS
Mean BLP score (Range, SD)	92.63 (31.42-140.4, 27.89)	-33.96 (-72.11-26.79, 26.33)
Mean lexical proficiency score (Range, SD)	.77 (.44-1, .19)	.65 (.25-1, .18)
Mean number of hours reading in Spanish weekly (Range, SD)	3.97 (1-5, 1.22)	2.53 (1-5, 1.07)
Spanish dialects	Mexican: 12 Ecuadorean: 3 Peninsular: 3 Salvadoran: 3 Chilean: 2 Peruvian: 2 Bolivian: 1 Colombian: 1 Mix: Chilean-Peninsular: 1 <i>Rioplatense</i> : 1	Mexican: 19 Mix: Mexican-American: 3 Mix: Mexican-Salvadorean: 1 Mix: Guatemalan-Salvadoran: 1 Salvadorean: 1 Guatemalan: 1 Honduran: 1 Cuban/Caribbean: 1 Colombian: 1 Castilian: 1

HSs' scores on the lexical recognition task (Fairclough, 2011) indicate intermediate to advanced proficiency. Finally, like the L2ers, the HSs in our study indicated reading approximately 2 hours/week in Spanish.

Table 3.2 also shows the Spanish dialects indicated by the HS and NS participants, who were asked 'How would you classify your dialect in Spanish (e.g., *mexicano*, *europeo*, *mezcla*, *mexicano-salvadoreño*, etc.)?' with an open-ended response format. The most represented dialect family across groups was Mexican Spanish dialects. Although there is a wider than ideal range of dialects in our participant pool, there is no previous study indicating that there are dialectical differences in the use of periphrastic or *se*-passives in Spanish to our knowledge.

Regarding proficiency, in the BLP, participants also rated their abilities to understand, speak, read, and write Spanish (and English) on a Likert scale from 0 to 6. The means, ranges, and

standard deviations for the HS and L2 groups' ratings of their Spanish abilities are shown in Table 3.3.

Table 3.3

HS and L2 Self-Assessed Proficiency by Domain

Group	HS	L2
Domain	<i>Rating (Range, SD)</i>	<i>Rating (Range, SD)</i>
Understanding	5.26 (3-6, 0.74)	4.97 (2-6, 1)
Speaking	4.9 (3-6, 0.8)	4.5 (2-6, 0.9)
Reading	4.7 (2-6, 1.02)	4.97 (3-6, 0.85)
Writing	4.27 (2-6, 1.23)	4.83 (2-6, 1.12)

As shown in Table 3.3, our HS and L2 participants rated their understanding of Spanish the highest (mean 5.26/6 for HSs and 4.97/6 for L2ers). Contrastively, HSs rated their speaking skills (mean 4.9/6) higher than reading (4.7/6) and writing (4.27/6) while L2ers rated their reading skills (mean 4.97/6) highest, then writing (4.83/6) and speaking last (4.5/6). These ratings are in line with studies that show that HSs tend to excel in their aural and speaking abilities while L2ers tend to excel in their reading and writing abilities (e.g., Sánchez-Walker & Montrul, 2021; Montrul, 2016; Montrul et al., 2014; Montrul et al., 2008, a.o). Overall, the HSs and the L2ers in our study indicate intermediate-advanced proficiency.

3.2. Materials and Procedure

Heritage speakers (HSs) participated in the same two experiments described in Chapter 2 – Experiment 1, a priming task with three phases, and Experiment 2, an acceptability judgment task (AJT) that manipulated verbal agreement between the Theme argument and the main verb in the case of the *se*-passive, or the auxiliary in the case of the periphrastic passive. As with the L2ers, the first session was conducted on Zoom and included the lexical recognition task, Experiment 1,

and the BLP, all of which lasted approximately 45 minutes. The second session included Experiment 2, which was completed on participants' own time between 8-13 days after the first session on PCIbex (Zehr & Schwarz, 2018) and lasted approximately 15 minutes. Participants were compensated with a \$15 Amazon gift card or course credit for a Spanish course at UCLA.

3.3. Results

3.3.1. Experiment 1

Experiment 1 was an elicited production, picture description task with a structural priming paradigm in three phases. Participants in the HS group produced a total of 480 transitive sentences across the baseline and post-test phases, and NSs produced a total of 464 transitive productions across the baseline and post-test phases, yielding 944 transitive productions in the baseline/post-test phase. In this data set, in the priming phase, HSs produced 720 transitive sentences and NSs produced 696 transitive sentences, yielding 1,416 transitive productions in this phase. Table 3.4 shows the raw frequencies of each production type by phase and prime for all transitive trials across both speaker groups.

Table 3.4*NS and HS Frequency of Transitive Production Type by Phase and Group*

Group	Phase	Prime	Target responses				Total
			Active	Periphrastic	Se-passive	Other	
NS	Baseline		156	10	9	57	232
	Treatment	Active	184	15	13	20	232
		Periphrastic	128	42	28	34	232
		Se-passive	137	30	36	29	232
	Post-test		138	28	42	24	232
HS	Baseline		183	9	19	29	240
	Treatment	Active	192	15	19	14	240
		Periphrastic	154	29	32	25	240
		Se-passive	149	29	40	22	240
	Post-test		156	24	37	23	240

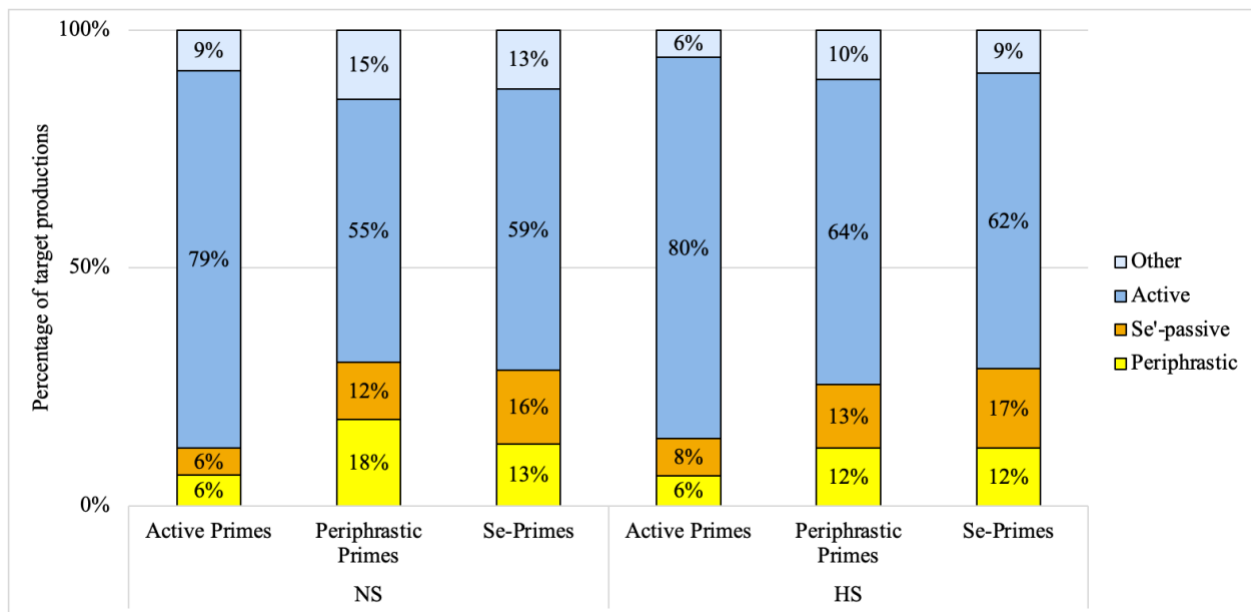
As shown in Table 3.4, the most common structure used across all phases and items was the active transitive structure, which is not surprising given that active is the unmarked form. As we will show below, both HSs and NSs were affected by the priming treatment, increasing their use of both passive types in both the treatment (priming) phase and the post-test phase, indicating both immediate and persistent priming effects of these structures. In what follows, we discuss first the priming phase, along with the statistical analyses, followed by the baseline and post-test comparison and statistical analyses.

3.3.1.1. Immediate Priming Effects: Priming Phase. During the priming or treatment phase, participants first heard and saw a sentence describing a set of images, then were asked to produce their own description of a new set of images using the given verb in the infinitive form. Figure 3.1 shows the percentage of target responses by prime type and speaker group for the NSs and the HSs. Both HSs and NSs produced a similar distribution of each sentence type: After active

primes, NSs produced active sentences 79% of the time, and HSs produced active sentences 80% of the time. After periphrastic primes, HSs produced periphrastic sentences 12% of the time, and NSs produced periphrastic sentences after periphrastic primes 18% of the time. After *se*-passive primes, HSs produced *se*-passives 17% of the time, and NSs produced *se*-passives after *se*-passive primes 16% of the time. When compared to the active primes, we also see that both groups produced more periphrastic passives after *se*-passive primes than after active primes, and vice versa: they produced more *se*-passives after periphrastic primes than after active primes.

Figure 3.1

NS and HS Percentage of Target Responses by Prime Type and Group



What we see here is an immediate priming effect for both passive types by both passive primes. As in Chapter 2, we used mixed effects logistic regressions to assess the significance of these immediate priming effects. We ran models for the response variable production type for each structure of interest: PERIPHRASTIC (0/1), and *SE-PASSIVE* (0/1). We included fixed effects for GROUP (HS/NS) and PRIME TYPE (ACTIVE, PERIPHRASTIC, *SE-PASSIVE*) and the interaction. The GROUP variable was sum-coded to compare each level to the mean for that variable. The PRIME

TYPE variable was set with ACTIVE as the reference level. We included random intercepts for PARTICIPANT and VERB. The structure of the *se*-passive model was as follows:

$$(1) \quad \text{Se} \sim \text{Group} * \text{PrimeType} + (1 | \text{Participant}) + (1 | \text{Verb})$$

We found a significant effect for PRIME TYPE such that both groups produced more *se*-passives both after *se*-passive primes ($\beta = 1.756$, $SE = 0.64$, $z = 2.745$, $p = .006$) and after periphrastic passive primes ($\beta = 1.357$, $SE = 0.642$, $z = 2.114$, $p = .035$) when compared to after active primes.

The structure of the periphrastic productions model was as follows:

$$(2) \quad \text{Periphrastic} \sim \text{Group} * \text{PrimeType} + (1 | \text{Participant}) + (1 | \text{Verb})$$

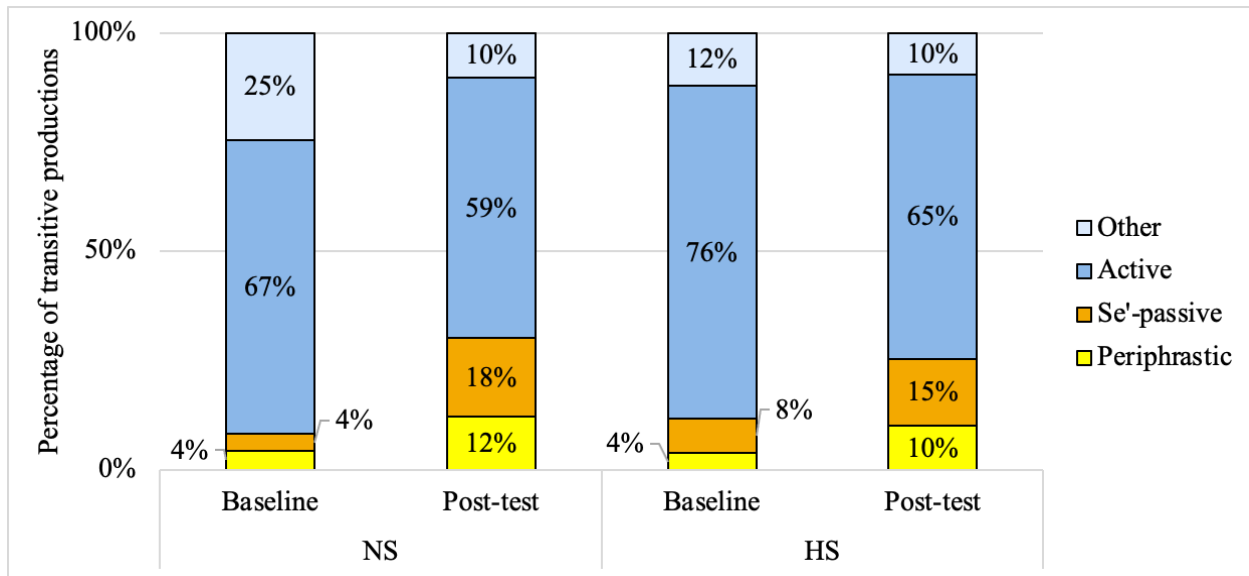
We found a significant effect for PRIME TYPE such that both groups produced more periphrastic passives after periphrastic passive primes ($\beta = 2.407$, $SE = 0.87$, $z = 2.767$, $p = .006$) and after *se*-passive primes ($\beta = 2.201$, $SE = 0.869$, $z = 2.533$, $p = .011$) than after active primes.

3.3.1.2. Persistent Priming Effects: Baseline and Post-Test Comparisons. We compare the percentage of each production type across the baseline and post-test phases to assess persistent priming effects for Spanish passives. As mentioned, the baseline phase was a simple picture description task with eight transitive trials and four intransitive trials (pseudorandomized). The post-test, which took place five minutes after the priming or treatment phase, consisted of the same design but with different items. The analysis below is conducted on the eight transitive items from the baseline and eight from the post-test across participants and groups. As shown in Figure 3.2, both NSs and HSs produced a similar number of periphrastic and *se*-passives across phases: both groups produced 4% periphrastic passives in the baseline phase. NSs also produced 4% *se*-passives in the baseline while HSs produced 8% *se*-passives in the baseline. Both groups increased their use of both passive types from the baseline to the post-test: with periphrastic passives, an increase to 10% for HSs and to 12% for NSs (6% and 8% increase, respectively) and with *se*-passives, HSs

increased their production of *se*-passives to 15% in the post-test, and NSs increased their production of *se*-passives to 18% in the post-test (a 7% and 12% increase, respectively).

Figure 3.2

NS and HS Percentage of Production Type by Phase and Group



Data were sum-coded for statistical analysis. We ran mixed effects logistic regressions for each production type of interest: PERIPHRASTIC and *SE-PASSIVE*. The response variable was production of the given structure (0/1). We included fixed effects for GROUP (NS/HS) and PHASE (BASELINE/POST-TEST), plus the interaction, and random intercepts for PARTICIPANT and VERB. The structure of the models is shown below:

$$(3) \quad \text{Periphrastic} \sim \text{Group} * \text{Phase} + (1 | \text{Participant}) + (1 | \text{Verb})$$

$$(4) \quad \text{Se} \sim \text{Group} * \text{Phase} + (1 | \text{Participant}) + (1 | \text{Verb})$$

In both models, we found a significant main effect of PHASE, such that both groups increased their use of periphrastic passives from the baseline to the post-test ($\beta = 0.815$, $SE = 0.318$, $z = 2.559$, $p = .011$), and both groups increased their use of *se*-passives from baseline to post-test ($\beta = 0.854$,

SE = 0.387, $z = 2.208$, $p = .027$). Thus, both the HSs and the NSs in our study showed persistent priming effects for both periphrastic and *se*-passives.

3.3.1.3. Proficiency and Reading Habits. In order to assess whether lexical proficiency and/or the number of hours spent reading Spanish weekly predicted HSs' productions and priming effects in Experiment 1, we ran mixed effects logistic regressions on the HS data for the response variables PERIPHRASTIC PASSIVE PRODUCTION (0/1) and *SE*-PASSIVE PRODUCTION (0/1). To assess immediate priming, we included fixed effects for PRIME TYPE (ACTIVE, PERIPHRASTIC, *SE*), PROFICIENCY (lexical recognition task score, continuous, normalized), and READING HABITS (hours spent reading Spanish weekly, continuous, normalized) with random intercepts for PARTICIPANT and VERB. In both the periphrastic passive model and the *se*-passive model, neither PROFICIENCY nor READING HABITS improved the model fit (as assessed with ANOVA model comparisons, $p > .1$), so, like with L2ers, HSs' immediate priming effects are not modulated by proficiency or reading habits. To assess persistent priming effects, we included fixed effects for PHASE (BASELINE/POST-TEST), PROFICIENCY, and READING HABITS with random intercepts for PARTICIPANT and VERB. Once again, neither the periphrastic passive model nor the *se*-passive models' fits were improved by including PROFICIENCY or READING HABITS, suggesting that HSs' persistent priming patterns are also not modulated by proficiency or reading habits.

3.3.1.4. Production Anomalies in Experiment 1. As in Chapter 2, we analyzed production errors and anomalies in the HS data from Experiment 1 in order to assess participants' accuracy in production. Compared to the L2 group, which had a 2.7% and 3.1% error rate in the verbal domain in the baseline/post-test phases and the priming phase, respectively, the HSs made very few production errors and only of two sorts – regularizing an irregular verb and using the periphrastic + *se*-passive hybrid structure. In the baseline/post-test phases, we saw one error of the

type *Verb Form*, in which the speaker regularized an irregular verb, i.e., they said *componió* for *compuso* ('he composed [a song]'). We also saw this type of anomaly in the priming phase with nine instances (nine speakers) of *producieron* for *produjeron* ('they produced [a vaccine]') in HSs' productions. Notably, this form was also attested in the NS data ($n = 5$ speakers) and the L2 data ($n = 1$ speaker).

In the priming phase, two HSs produced *se*-passives with an Agentive *por*-phrase, and one speaker produced a combination of a *se*-passive and a periphrastic passive. All three instances are similar to what Gamez and Shimpi (2016) call a 'function passive'. Example (5) is repeated (referred to as (16) in Chapter 1) for comparison.

- (5) *El árbol se rompió por el rayo.
 the tree SE break.PST.3SG by the lightning
 'The tree was broken by the lightning.'

(Gamez & Shimpi, 2016, p. 216)

- (6) Los zapatos se arruinaron por el cachorro.
 the shoes SE ruin.PST.3PL by the dog
 'The shoes were ruined (*by the dog).'

In Example (6), we see a *se*-passive with an Agentive *por*-phrase equivalent to the function passive produced by monolingual Spanish-speaking children in Gamez and Shimpi's (2016) Spanish passive priming study. Prescriptively, *se*-passives do not allow for pronounced Agent arguments. In (7) we see another sort of mixed form in which the speaker uses both the clitic *se* and the present progressive form of the periphrastic passive, both of which passivize the sentence and are not felicitous together.

- (7) Los productos de Apple se están siendo vendidos.
 the products of Apple SE be.PRS.3PL be.PTCP sell.PTCP.M.PL
 'The Apple products (*SE) are being sold.'

Crucially, these forms were not attested in the Spanish-dominant NS data, but they were attested in the L2 data.

Regarding full periphrastic passives, which are highly infrequent in Spanish, HSs produced four full periphrastic passives across all phases (priming phase: 3; post-test: 1). Interestingly, the full passive produced by a HS in the post-test phase appeared with the verb *seleccionar*, which also elicited full passives from NSs and L2ers.

- (8) El vino fue seleccionado por las mujeres
the wine be.PST.3SG select.PTCP.M.SG by the women
'The wine was selected by the women.'

We can only conjecture about the reason why this stimulus elicited full passives across speaker groups. One possible explanation is that in this set of images, the Agents were visible. However, we also find full passives with stimuli in which the Agent is not depicted (*robar* 'rob' and *abandonar* 'abandon') and stimuli in which only the Agent's hands are visible (*arreglar* 'fix').

For example, two HSs used a full passive with *robar* as shown in (9).

- (9) El carro fue robado por alguien.
the car be.PST.3SG rob.PTCP.M.SG by someone
'The car was robbed by someone.'

While previous studies show that passives are produced more when speakers describe images with only the hands of the Agent visible than when they describe images in which the whole Agent is visible (e.g., Rissman et al., 2019), we leave to future research whether the production of a highly-rare full passive (vs. short passive or *se*-passive) is also affected by this factor (and in what direction).

3.3.1.5. Participants. As mentioned in Chapter 2, although our regression models account for variance by participant with random intercepts for participant in each model, we wanted to explore again how many participants produce *no passives* by type and phase. As shown in Table 3.5, a little more than one third of HS participants produced no periphrastic passives in any phase. We also note that only three HS participants produced periphrastic passives in the baseline phase,

and half of the HS participants produced no *se*-passives in the post-test phase. This shows quite a bit of variability in the HS data by participant.

Table 3.5

Number of Participants Who Did Not Produce Passives by Type and Phase - All Groups

Phase	Passive Type	Number of Participants		
		NS	HS	L2
All Phases	No Periphrastic Passives	1	12	7
	No <i>Se</i> -passives	1	5	3
	No Passives	1	4	1
Priming Phase	No Periphrastic Passives	9	12	7
	No <i>Se</i> -passives	6	7	4
	No Passives	2	4	2
Baseline	No Periphrastic Passives	21	27	20
	No <i>Se</i> -passives	20	19	18
	No Passives	16	17	15
Post-test	No Periphrastic Passives	18	20	22
	No <i>Se</i> -passives	9	15	10
	No Passives	3	11	8

3.3.2. Experiment 2

As mentioned, Experiment 2 was our receptive timed acceptability judgment task (AJT). Participants listened to the audio of sentences being read as the corresponding text unrolled on the screen. After the text unrolled completely and the audio played, participants had three seconds to judge sentences as acceptable or not. After three seconds, the screen moved to the next trial and the unanswered trial was coded as a *timed-out*. No HS participant ran out of time on more than three trials in one condition (e.g., periphrastic, grammatical trials). Participants had to

correctly reject at least half of the ungrammatical control items in order to be included in the analysis, which excluded one NS participant and four HS participants. The number of timed-out trials by group and type is shown in Table 3.6.

Table 3.6

NS and HS Number of Timed-Out Trials by Group and Condition (Type and Grammaticality)

	Target				Control				Totals
	<i>Periphrastic</i>		<i>Se</i>		<i>Active</i>		<i>Intransitive</i>		
	<i>G</i>	<i>U</i>	<i>G</i>	<i>U</i>	<i>G</i>	<i>U</i>	<i>G</i>	<i>U</i>	
NS	11	4	14	0	10	0	7	7	53
HS	11	7	15	5	14	2	9	5	68
Totals	22	11	29	5	24	2	16	12	121
Total Target Trial Time Outs				67	Total Control Trial Time Outs				54

Notably, HSs and NSs ran out of time on more grammatical than ungrammatical trials, suggesting they may have run out of time looking for the ‘mistake’ that was not there. However, as mentioned in Chapter 2, we do not draw any firm conclusions about missed trials given that external factors were likely at play, and these trials were excluded from our analysis. For the HS and NS groups, we were left with 1,821 test item responses.

Table 3.7 shows the means and standard deviations of the accuracy scores by structure type, grammaticality, and group. Participants were asked to select either *yes, this sentence sounds natural* or *no, this sentence sounds unnatural*, which yielded a binary response variable. For readability, tables and analyses are conducted on accuracy scores, i.e., answering *yes* for grammatical sentences and *no* for ungrammatical sentences, as percentages or proportions of total trials in each condition.

Table 3.7*NS and HS Mean Accuracy Scores (SD) for Experiment 2 by Type, Grammaticality, and Group*

	NS		HS	
	Periphrastic	<i>Se</i> -passive	Periphrastic	<i>Se</i> -passive
Grammatical	91% (28.8%)	95.41% (21%)	91.7% (27.6%)	91.6% (27.9%)
Ungrammatical	96.93% (17.3%)	95.26% (21.3%)	95.3% (21.3%)	94.5% (22.9%)

As shown in Table 3.7, HSs converge with NSs on accuracy scores for both grammatical and ungrammatical periphrastic and *se*-passives, which was confirmed in our statistical analysis discussed below.

We ran a mixed effects logistic regression on Experiment 2 accuracy scores for target items with the HS and NS groups. The response variable was ACCURACY (0/1) with fixed effects for TYPE (PERIPHRASTIC/*SE*-PASSIVE), GRAMMATICALITY (GRAMMATICAL/UNGRAMMATICAL), ORDER (SV/VS), and GROUP (NS or HS), and their interactions. We included random intercepts for PARTICIPANT and ITEM. As with the L2 group, the variable ORDER was not a significant predictor and will not be discussed further. The final structure of the model was as follows:

$$(10) \quad \text{Accuracy} \sim \text{Type} * \text{Grammaticality} * \text{Group} + (1 | \text{Participant}) + (1 | \text{Item})$$

We found a significant main effect for GRAMMATICALITY such that participants overall were more accurate with *ungrammatical* trials than grammatical trials ($\beta = 0.311$, $SE = 0.111$, $z = 2.809$, $p = .005$). This is interesting given that the ungrammatical condition was the more problematic condition for the L2ers. We will return to this thought in Chapter 4. We found no main effects or interactions for the GROUP variable ($p > .1$), suggesting that these two speaker groups converged in their performance on critical items in Experiment 2.

3.3.2.1. Proficiency and Reading Habits. We wanted to assess whether proficiency and reading habits had an effect on HSs' accuracy scores in Experiment 2. We ran mixed effects logistic regression models on the response variable ACCURACY (0/1) with fixed effects for TYPE (PERIPHRASTIC/*SE*), GRAMMATICALITY (GRAMMATICAL/UNGRAMMATICAL), PROFICIENCY, and READING HABITS with random intercepts for PARTICIPANT and ITEM. We found that including neither PROFICIENCY nor READING HABITS improved the model fit as assessed with model comparisons with ANOVA ($p > .1$).

3.3.3. Performance in Experiment 1 and Experiment 2

In order to assess whether accuracy in the AJT (Experiment 2) predicted productions in the priming task (Experiment 1), we ran mixed effects logistic regressions with the HS data only on the production response variables (PERIPHRASTIC PASSIVE 0/1, *SE*-PASSIVE 0/1) with fixed effects for PHASE and for ACCURACY and found no significant effects or interactions with the ACCURACY variable ($p > 0.1$), suggesting that accuracy in the receptive task did not predict productions in the priming task, which is not surprising given the ceiling effects found in the AJT task.

3.4. Discussion

Returning to our research questions mentioned above, we found that HSs, like L2ers and NSs, can be primed to produce both Spanish passive types in a production task. Further, in our HS group, like in our NS group and in contrast to our L2 group, we find persistent priming effects for *both* Spanish passives – HSs, as a group, increased their use of periphrastic passives and *se*-passives from the baseline to the post-test. While we cannot necessarily comment on frequency effects in persistent priming of both passive types in this case, we do find that, unlike in the L2 group, the higher frequency target language structure is *not* the only structure that shows persistent priming effects for HSs and NSs. We also find that HSs are quite successful in their production of

both passive types, with very few errors, though we notably find a few instances of a combined *se*-passive/periphrastic passive structure referred to as the ‘function passive’ in child priming studies (Gamez & Shimpi, 2016). In the receptive task, we find that HSs successfully accept grammatical sentences and, crucially, reject ungrammatical sentences, with no statistical difference between the HS group and the NS group, which suggests that HSs have target-like representations of the passive structures, accurately representing the Theme argument as the syntactic subject in these sentences.

Overall, our results suggest that HSs converge with NSs on their productive and receptive abilities with both periphrastic and *se*-passives. Regarding the periphrastic passive, it is impossible to tell whether HSs’ ‘target-like’ performance is due to an early exposure advantage or due to positive transfer from English. With the *se*-passive, we see that this structure is maintained well in (intermediate-advanced) HSs’ grammars. This is interesting because the morphosyntactic domain in particular is considered vulnerable to erosion in HS grammars, and also because it is debatable whether this structure has been fully acquired before the language dominance shift (see Section 1.3 in Chapter 1), but HSs in the present study show native-like competence and performance with this structure. Also, the results from Rodriguez’s (2018) self-paced reading study suggested that HSs did not demonstrate recognizing the same agreement error manipulated in the present study with *se*-passives, in which our HS population performed at ceiling.

We learn a few things here. First, HSs’ knowledge of the effects of the *se*-passive syntactic operations is robust: they were able to identify and reject ungrammatical sentences with *se*-passives despite the known ‘yes’-bias in HS (and L2) judgments (Polinsky, 2018; Romano & Guijarro Fuentes, 2023). Next, while we know that HSs tend to show slower processing times and less accuracy in online studies when compared to the typical NS baseline (e.g., Jegerski et al.,

2014; Keating et al., 2016), language processing in heritage speakers remains a relatively understudied area which merits further attention. Is it the case that language processing in HSs is fundamentally different from the typical NS, as has been suggested for L2 processing (e.g., Clahsen & Felser, 2006; 2016)? Or, do HSs process language in a similar manner to target language dominant NSs, as has been shown in studies with grammatical gender cues and lexical retrieval (Fuchs et al., 2021; Fuchs, 2022, but cf. Scontras et al., 2018 for a discussion of underlying differences between HSs and NSs being due to an underlying difference in the grammar, not processing only)? Or, as with grammatical competence, do HS language processing patterns vary by mode (e.g., aural versus written) or domain (e.g., morphosyntactic versus phonological)? We leave these questions to further research.

As in the case of the L2 speakers' performance on *se*-passives, proficiency did not predict HSs' performance on the receptive task, even though both groups were matched in lexical decision task (proficiency) scores. This reinforces the conclusion that Spanish passives are robust in heritage Spanish speakers' grammars, even in those who may struggle with other morphosyntactic structures or in other domains. However, it could also be the case that the lexical recognition task was not an appropriate measure of proficiency, and our HS group actually has a higher proficiency in Spanish than the L2 group.

Finally, our results, when taken together, are most in line with accounts that highlight the critical role of age of acquisition for the acquisition of functional features, and thus predict an overall advantage for HSs when compared to L2ers in ultimate attainment/language maintenance. These results have important pedagogical implications: while HSs' knowledge of *se*-passives is quite robust, L2ers show some difficulties with these structures. In the classroom, perhaps L2ers need more support with functional features such as the clitic *se* while HSs do not necessarily need

this type of support. In turn, in the HL classroom, time can be spent on other domains of HL knowledge, such as bolstering HSs' skills in the written mode.

CHAPTER 4: SUMMARY, FUTURE DIRECTIONS, AND IMPLICATIONS

In this dissertation, we have investigated the acquisition and maintenance of Spanish periphrastic and *se*-passives in second language learners (L2ers), heritage speakers (HSs), and Spanish-dominant native speakers (NSs). This chapter begins with a summary of the findings from Chapters 2 and 3, including a breakdown by experiment. Next, we give an overview of open questions for future research, followed by a discussion of the implications and the limitations of the present study. Finally, we summarize the conclusions we draw from this study.

4.1. Summary of Findings

In this study, we conducted a production task with a structural priming paradigm (Experiment 1) and a receptive task that consisted of a timed acceptability judgment task (AJT) (Experiment 2) with three adult speaker groups: L2ers, HSs, and Spanish-dominant NSs of Spanish. This study is novel in that it is the first to compare Spanish periphrastic and *se*-passives directly in any speaker group. We explored a number of factors:

- (a) *Age of acquisition*: Because passives are later-acquired, complex structures, they make a worthwhile target for HSs given that they may only be fully acquired after the language dominance shift and that inflectional morphology and non-canonical word orders tend to be vulnerable areas to attrition in heritage speakers (e.g., Polinsky, 2009). Importantly, we find a difference in receptive abilities with the *se*-passive between the HSs and the L2ers such that the HSs performed at ceiling on the *se*-passives while the L2ers did not, suggesting that age of acquisition is a key factor in predicting whether speakers are able to fully acquire functional elements not instantiated in their L1.

- (b) *Dominant language transfer*: The mismatch of available passive forms in the target language (Spanish) and the dominant language (English) offers an opportunity to assess whether the possibility of dominant language transfer is the main predictor of performance on these complex structures. We find that while HSs converge with NS, L2ers do not, suggesting that English-dominance does *not* interfere HSs' knowledge of these structures.
- (c) *Frequency effects*: The periphrastic passive is significantly less common than the *se*-passive, allowing us to assess frequency effects which are thought to affect L2 learning patterns (e.g., Ellis, 2002) and/or structural priming patterns, though the direction of the effect in structural priming is debated: some studies suggest an inverse frequency effect, making the less common structure a more likely prime (e.g., Ferreira & Bock, 2006, et seq.) while others suggest that the higher frequency structure will be a more likely prime (e.g., Hurtado & Montrul, 2021). We find that all three groups show immediate priming effects with both structures, but L2ers only show persistent priming effects with the higher frequency *se*-passive.
- (d) *Relationship between productive and receptive abilities*: We compare production patterns to receptive performance to assess whether production patterns indicate grammatical representation and whether we find a difference in speaker groups by task type. We find an unusual production advantage for the L2ers relative to their performance in the receptive task. We argue that these adult learners are able to use domain-general strategies to compensate for lack of (complete) implicit grammatical knowledge.

We will begin with a deeper discussion of the findings of Experiment 1.

4.1.1. Experiment 1

Since this study constitutes the first to directly compare Spanish periphrastic passives and *se*-passives in these adult speaker groups, we began with a basic question: Can these speakers be primed to produce these structures in a production task? Our results show that all three speaker groups can be primed to produce both periphrastic and *se*-passives, which is shown by their higher rates of production of periphrastic and *se*-passives after passive primes when compared to their productions after active primes. We found immediate priming effects for both passives by both passive prime types in all three groups. Further, neither proficiency nor reading habits predicted patterns of priming in our experimental groups (L2ers and HSs). We found no group differences when comparing L2ers to NSs and HSs to NSs, suggesting similar patterns of immediate priming effects across speaker groups. Additionally, our study shows that both the periphrastic and *se*-passive prime both passive types, suggesting some degree of shared or connected representations of periphrastic and *se*-passives in the Spanish grammar, as has been suggested in crosslinguistic studies (e.g., Kotzochampou & Chondrogianni, 2022).

We also collected baseline productions, before the priming phase, and post-test productions, after the priming phase, to assess persistent priming effects. Recall that the baseline and post-test tasks were simple picture description tasks in which participants were provided with an infinitive verb (e.g., *lavar* ‘wash’) and asked to describe what happened in the images they saw. Before we discuss persistent priming effects from the baseline to post-test comparison, it is prudent to mention that prior to this study, there was very little information about the baseline rates of production of periphrastic and *se*-passives in adult NSs of Spanish. What was known about passive frequency came from analyses of written corpora (Green, 1975; Jisa et al., 2002) and crosslinguistic analyses of periphrastic passive use only (e.g., Berman & Slobin, 1994). We found

that our NSs produced passive structures approximately 8% of the time in the baseline task before priming. While we do not find a clear difference in the number of periphrastic versus *se*-passives produced in the NS baseline data, we note that more *speakers* produced *se*-passives than periphrastic passives, and, overall, *se*-passives were produced more throughout the experiment. Within the periphrastic passive productions, very few were full, long passives with an Agentive *por*-phrase. We lend support to the observation that *se*-passives are more common than periphrastic passives in Spanish (Green, 1975), and overall, passive forms, particularly full passives, are quite infrequent in spoken speech (Berman & Slobin, 1994; Jisa et al., 2002).

We compared baseline rates of passive production to the post-priming phase, which took place five minutes after the priming phase, to assess persistent priming effects. First, all three speaker groups showed persistent priming effects with *se*-passives, increasing their production of *se*-passives from the baseline to the post-test. We also found that L2ers exhibited persistent priming effects with the *se*-passive only, which supports the notion that priming in the L2 is modulated by target language frequency, such that the higher frequency target language structure will show greater persistent priming effects.

What we do not find in the NS data (nor the L2 and HS data) is an inverse frequency effect relatively speaking: some studies suggest that less frequent structures will show greater priming effects due to a learning or surprisal effect (Ferreira & Bock, 2006; Kaschak et al., 2011; Jaeger & Snider, 2013; Branigan & Messenger, 2016, a.o.). If periphrastic passives showed greater priming effects (in any group but particularly in the NSs), this could be attributed to an inverse frequency effect, given that the periphrastic passive is less common than the *se*-passive, but this is not what we find. It may be the case that because we are priming two structures that are felicitous in the same experimental conditions, speakers opt for the more frequent *se*-passive because it is

more common and natural in spoken (and written) Spanish. We also found that HSs and NSs, but not L2ers, show persistent priming effects with the periphrastic passive, but not to a greater degree than the persistent priming effects shown with the *se*-passive.

Regarding production errors, unsurprisingly, we find that the L2 group produced the most errors in their productions, mostly in the form of participial agreement errors and verb form errors (See Section 2.3.1.5.). Interestingly, we find a form we refer to as *Sprinkled 'Se'*, which had been anecdotally noticed by the author in the context of an L2 classroom, in which L2ers use the clitic *se* in infelicitous contexts – perhaps in an attempt to sound more Spanish.

- (1) Unas científicas se están produciendo una cura.
some scientists SE be.PRS.3PL produce.PTCP a cure
'Some scientists (*SE) are producing a cure.'

For example, in (1) we see a full DP subject, *unas científicas*, produced with the clitic *se*, which would normally passivize this sentence but is infelicitous when the Agent is the pronounced, syntactic subject. Overall, however, the error rate in the verbal domain for L2 participants was very low, approximately 3% in the production task, which means that L2ers are quite successful in their productions overall.

In the HS data, we find a couple of instances of a mixed form between the periphrastic and the *se*-passive, such as (2).

- (2) Los zapatos se arruinaron por lo que parece ser un perro.
the shoes SE ruin.PST.3PL by what appear.PRS.3SG be.INF a dog
'The shoes were ruined by what appears to be a dog.'

In this example, the participant uses the *se*-passive but includes the (illicit) Agentive *por*-phrase *por lo que parece ser un perro*. This mixed form has also been attested in monolingual Spanish-speaking children who were primed with a periphrastic passive but produced a *se*-passive and at times did so with an Agentive *por*-phrase (Gámez & Shimpi, 2016). We also found one instance

of a form with the periphrastic passive used with the clitic *se* in the HS data. Three HSs produced these mixed forms, once each, suggesting they likely result from a performance issue more than a representational issue, especially given HSs' high receptive scores as discussed below. In the NS data, as expected, there were very few errors: one error with regularizing the participle *devuelta* (returned) to **devolvida*, and several instances of the common **producieron* (produced) for *produjeron* across all three speaker groups ($n = 9$ HSs, 5 NSs, and 1 L2er).

Overall, we can conclude that: (1) Immediate priming of both Spanish passives is possible in adult L2ers, HSs, and NSs. (2) L2ers and HSs can both produce Spanish passives with few errors. (3) Persistent priming in the L2 does seem to be modulated by L2 frequency, not whether a structure is shared in the L1. (4) Interestingly, L2ers are not persistently primed with periphrastic passives, but HSs and NSs are.

4.1.2. Experiment 2

Since L2ers and HSs can be primed to produce both Spanish passives, and rather successfully, we wanted to probe their grammars further with a receptive task. Can we assume that evidence of priming effects, and productions generally, are representative of L2 and HS grammars (e.g., McDonough, 2006; Bernolet et al., 2013, 2016; Jackson & Ruf, 2017; Kaan & Chun, 2017; Messenger et al., 2022), or is it possible that adult speakers resort to more domain-general strategies that only give the appearance of implicitly-acquired structure (e.g., Meisel, 1997; Clahsen & Felser, 2006, 2018)?

While previous studies have investigated L2ers' and HSs' knowledge of properties that distinguish the periphrastic passive and the adjectival 'passive' on one hand (Bruhn de Garavito & Valenzuela, 2005, 2008; Valenzuela et al., 2015), and the *se*-passive and impersonal *se* on the other (Bruhn de Garavito, 1999; Tremblay 2005, 2006), making a direct comparison between the

periphrastic passive and the *se*-passive presents some challenges. Because the *se*-passive does not allow for a pronounced Agent argument, testing the interpretation of reversible semantic roles (i.e., Agent, Patient) is not available. Rodriguez (2018) tested HSs' online processing of *se*-passives with agreement mismatches (1PL/2SG where 3PL is correct) in a self-paced reading task and found no evidence of their noticing of these mismatches as evidenced by a slow down (which was found in the Spanish-dominant NS participants in the same study). Given this finding and the restrictions on these forms, we chose to test participants' knowledge of verbal agreement viz. their ability to detect agreement mismatches in the periphrastic passive and the *se*-passive. If speakers have acquired/maintained target-like, abstract representations of these structures, they would know that the verb should agree with the Theme argument, i.e., the syntactic subject. If, however, they are ignoring *se* and positing a simpler structure (i.e., a null subject structure *proVO*), they may accept mismatched verbal agreement. Notably, 1PL agreement is felicitous in some contexts with the periphrastic passive (e.g., *fuiamos seleccionados* 'we were selected') while 1PL never appears with the clitic *se* alone (only in clitic doubled constructions, e.g., *se lo dimos [a la mujer]* 'we gave it to her'). Nevertheless, L2ers were less likely to reject the ungrammatical *se* trials, which contained the impossible clitic+verbal inflection sequence.

Unlike the L2ers, the HSs in our study converged with NSs in all conditions tested in the AJT, even though the HSs and L2ers were matched in proficiency. Moreover, we found an interesting mismatch between L2ers' performance on the production task and their performance on the receptive task: in the priming experiment, they produced both passive types mostly accurately, and they showed greater persistent priming effects with the *se*-passive, but in the AJT they reached ceiling with all conditions, correctly accepting grammatical periphrastic and *se*-passives and correctly rejecting ungrammatical periphrastic passives, *except one*: ungrammatical

se-passives. While they still performed rather well on this structure, correctly rejecting approximately 80% of ungrammatical *se*-passives, they show significant differences in this condition compared to the others as a group, performing at ceiling in the periphrastic passive and the grammatical *se*-passive conditions. Importantly, we only included participants who performed above chance on ungrammatical control items with mismatched gender agreement on adjunct NPs, which demonstrated that they were attending closely to the sentences and forms. While we did find that proficiency predicted L2 performance on ungrammatical trials generally, such that lower proficiency L2ers were more likely to incorrectly accept ungrammatical sentences in general, we did not find that proficiency predicted performance on *se*-passives specifically. This finding suggests that L2ers may not have fully acquired the formal properties of the *se*-passive, even in advanced, ultimate states of L2 acquisition. Moreover, we found that productions of *se*-passives did not significantly predict their performance in the problematic ungrammatical *se*-passive condition – some participants did not produce many or any *se*-passives, but nevertheless did well in the AJT task for this structure, and crucially, vice versa, some participants produced a number of *se*-passives and nevertheless scored very low in the AJT task for this structure. This lends support to Partial Access accounts that predict difficulties with L2 features not instantiated in the L1 in speakers who have acquired the second language past puberty, and that adult L2ers may use domain-general approaches as a compensatory strategy (e.g., Shallow Structure Hypothesis, Clahsen & Felser 2006, 2018). We argue that a cognitive-general approach may have worked more successfully in the production task because both the Agent and the Patient (syntactic subject) were 3rd person plural, while in the receptive task the ungrammatical items were mismatched in agreement features, which forced participants to fully reconstruct the intended structure.

4.2. Open Questions and Future Directions

Our findings lead us to some interesting future lines of inquiry.

Regarding our priming task (Experiment 1), we find that participants perform very similarly across groups and that their performance is not predicted by their accuracy in the receptive task. When working with adult speakers, we question whether L2ers' and HSs' 'native-like' performance in the production task is due to implicitly-acquired, 'native-like' grammar, or whether it may be the case that adult speakers can successfully use domain general cognitive mechanisms such as analogy in priming tasks and productions generally. Future work to elucidate this question could include tests of working memory and analogic abilities in participants to compare to their behavior on priming tasks. If priming effects are more a reflection of adult speakers' domain general cognitive abilities, we would expect to find correlations between their working memory or analogic abilities and the strength of the priming effects in these speakers.

We find an interesting pattern in the AJT such that L2ers (predictably) struggled to accurately reject ungrammatical *se*-passive sentences to the same degree of accuracy as their judgments of the other sentences. The HSs and NSs, on the other hand, showed a slight difference in accuracy between grammatical and ungrammatical trials in the opposite direction. Though we cannot say that HSs and NSs were inaccurate in their judgments of grammatical trials (performing at approximately 91-95% accuracy in grammatical sentences), we see that they are slightly more accurate with rejecting ungrammatical trials (approximately 95-96% accuracy). This is interesting in that we find another case in which HSs and NSs converge, even with a slightly unexpected pattern. These two speaker groups showed confident judgments with ungrammatical sentences, demonstrating robust knowledge of these structures, while their judgments of grammatical sentences may have been slightly less accurate, arguably because they were searching for a

‘mistake’ that was not there. We collected data on participants’ response times to the AJT. While any information we learn from this data should be taken with caution given that participants completed the AJT in their own, uncontrolled space, we found reaction time differences across conditions, such that the grammatical sentences took longer to judge. This question is left for deeper exploration in the future.

An Event-Related-Potential (ERP) study in the future could also help us assess whether highly advanced adult L2ers who perform at native-like levels in behavioral tasks also exhibit native-like language processing signatures. For example, if these L2ers have acquired the full representation of *se*-passives, we expect them to exhibit a typical P600 when presented with ungrammatical *se*-passives that contain mismatched agreement. If we do not find a P600 with ungrammatical *se*-passives, but we do with ungrammatical periphrastic passives, this would reinforce the idea that functional features that are not present in the L1 are not fully acquirable to native-like levels after puberty (e.g., Weber & Neville, 1996; Chen et al., 2007; Gouvea et al., 2010, Zheng & Lemhöfer, 2019).

One big question is why do L2ers struggle with the *se*-passive specifically (when compared to the periphrastic passive)? One possible explanation is that *se*-passives involve a non-canonical syntax-semantics mapping in that the semantic Theme argument, normally a syntactic object, acts as the syntactic subject. However, if this were the source of difficulties, we would expect them to also struggle with the periphrastic passive, but they performed at ceiling with this structure. Another possible explanation is that English does not have an equivalent *se* clitic form. There is plenty of evidence that structures not present in the L1 are particularly difficult for adult L2ers (e.g., Lardiere, 2009), though some studies show that Spanish L2ers *can* perform well with *se*

constructions with appropriate pedagogical interventions (de la Fuente, 2015) or at very late stages of acquisition (Bruhn de Garavito, 1999; Alonso, 2011).

Another source of difficulty for Spanish L2ers in acquiring *se*-passives is that the clitic *se* is highly multifunctional, appearing in other structures such as impersonals, reflexives, reciprocals, datives, unaccusatives, etc., so L2ers may have difficulties assigning the clitic the intended function and therefore representing the structure fully. While it is likely some combination of the above three reasons (non-canonical mapping, no equivalent in English, multifunctional element), the last reason presents a promising new avenue of research. In order to explore this question, we could test other items that fulfill numerous functions, such as Spanish *que/qué*, which can be a *wh*-element, a complementizer, and an emphatic expression, and appears in many contexts. If it is not the *se*-passive specifically that causes difficulties for L2ers, but rather that it involves a highly multifunctional element, we would expect advanced L2ers to also struggle with another multifunctional element like *que*. We could also explore other uses of *se* in Spanish that do map (more transparently) onto an existing form in English, such as the dative clitic '*se*' (to him/her), to determine if they also show greater difficulty with this form compared to other, less polysemous argumental clitics, such as the dative clitic '*le*' or the accusative clitic '*lo*'.

4.3. Implications

Our study has important pedagogical implications for the instruction of Spanish as an L2 and as an HL. As White (2023) notes, though generative SLA research does not necessarily presume to address pedagogical concerns, theoretical findings can inform pedagogy in some important ways ‘particularly relating to what aspects of language it is not necessary to teach, what aspects might be fruitful to teach, what kind of evidence (positive or negative) is helpful, and so forth’ (p. 359). With this observation in mind, we offer some insight into the pedagogical

implications of our study. We find that HSs' knowledge of (the agreement relations) in periphrastic and *se*-passives is quite robust, which suggests that time in the HL classroom may be best spent on bolstering HSs' skills in other areas such as reading and writing (as opposed to pedagogical supports for the acquisition of functional elements like the *se* in *se*-passives).

On the other hand, L2ers demonstrate a need for pedagogical support in their acquisition of *se*-passives. Recall that Alonso (2011) investigated Spanish L2ers' use of structures with semantic and syntactic impersonality, many of which call for *se*, in translation and spontaneous speech tasks. They found that L2ers with fewer than five years of Spanish often opted for English verbal paradigms (i.e., the periphrastic passive) in their translations while the group with more than five years of Spanish employed the *se*-passive in the same contexts. The difference between groups, along with the pattern of adopting English verbal paradigms or word-by-word translations without using *se* in the less experienced group, led Alonso to conclude that structures with *se* should be given special attention in the L2 classroom to avoid fossilization of unnatural English-like forms. At the same time, as White (2023) notes, it is important to uncover the most useful methods of presentation and amounts of information to provide L2ers in supporting their acquisition of more difficult elements like *se*. Bruhn de Garavito (2013) found that introductory Spanish textbooks used in North America tend to overwhelm learners with information regarding object clitics (including the clitic doubled dative *se*) without distinguishing properties that L2ers acquire more easily from properties that require more information.

De la Fuente (2015) tested the effectiveness of Computer-Assisted-Language-Learning on the acquisition of properties associated with impersonal *se* and *se*-passive and found that L2ers did improve with some metalinguistic feedback that consisted of an explanation that in the *se*-passive, the verb agrees with the complement, along with examples. Notably, this study also

demonstrated that the L2 group that received metalinguistic feedback in their *L1 English* (example shown in Figure 4.1) achieved greater improvements than the group that received metalinguistic feedback in their L2 Spanish.

Figure 4.1

Example of Metalinguistic Feedback in English in De la Fuente (2015, p. 189)

Example 1

EFL1 feedback + protocol

Good! You used the passive *se*. Remember, however, that the verb and the complement agree (i.e., the verb is singular or plural depending on the complement). Notice how it is used in these examples:

- (1) En los años 80 se privatizó **la** industria petrolera.
*The oil industry **was** privatized in the 80's.*
- (2) En los años 80 se privatizaron **muchas** industrias.
*Many industries **were** privatized in the 80's.*

This shows that L2ers can improve on their knowledge of agreement in the *se*-passive with metalinguistic feedback, and agreement was what the L2ers in the present study struggled with. Future research could determine whether other properties of the *se*-passive could also benefit from this sort of instruction. Looking at the errors made by L2ers in our study, we could test the effects of instruction on their knowledge that *se*-passives do not permit an Agentive *por*-phrase (which they used at times in the production task) and their knowledge of when to use *se* versus when they are incorrectly using *Sprinkled Se*.

4.4. Limitations

We would be remiss not to address the limitations of the present study. Beginning with the participants, it would be prudent to explore these same questions and tasks with a more controlled,

larger participant pool. In future research, we could control better for age of acquisition and years and mode of Spanish exposure in the L2 group. Ideally, we could also control for dialect in the NS and HS groups to ensure that there are no differences that have gone unnoticed in previous literature, and we would collect more precise information about classroom experience from all participants to ensure that we are accounting for the ways in which differing classroom experience may affect the language acquisition process. With the HSs, while this group will always be somewhat heterogeneous when compared to other speaker groups, it would be prudent to control for the generation of the HSs, such that we are grouping them according to whether they are first generation speakers (U.S.-born with foreign-born parents), generation 1.5 (the children of first generation speakers), second generation heritage speakers, etc. (Montrul, 2011; Blair, 2020). Further, including a control group that is equivalent to the home language variety (e.g., homeland Mexican Spanish speakers to compare to heritage Mexican Spanish speakers) would improve the precision of this study.

Regarding proficiency, while the debate of how to measure proficiency is ongoing and imperfect, including another measure of proficiency such as an elicited imitation task (e.g., Ortega et al., 2002, et seq.) to corroborate or replace the lexical recognition task may inform our conclusions and discussions of the effects of proficiency on structural priming patterns. We could also include a more syntax-oriented measure of proficiency such as the modified DELE (Montrul, 2012a), though we decided on the lexical recognition task as a proxy for proficiency to avoid any structural priming effects from completing a task like the modified DELE in which participants would have encountered structures that are tested in our experiments, such as the active transitive structure and gender and number agreement. Further, previous work suggests that lexical proficiency is a useful diagnostic of HS proficiency (e.g., Polinsky & Kagan, 2007).

Regarding the experimental design, it would be ideal to include a long-term priming measure one week after the initial priming treatment in order to assess long-term effects of the structural priming treatment, how these effects vary by group and structure, and to contribute to the conversation on long-term priming as implicit learning (Bernolet et al., 2016). For example, Hurtado and Montrul (2020) found that while HSs and L2ers increased their use of a primed structure both five minutes and one week after treatment, NSs returned to their baseline rates of production of the same structure, perhaps because of a learning effect for the HSs and L2ers. Finally, within the AJT, it would be informative to include questions about speakers' judgments, asking them to explain why they answered that a given sentence was acceptable or not, and to add a confidence scale to measure their confidence in their judgments.

4.5. Conclusion

In this dissertation, we set out to investigate the nature of interlanguage and endstate grammars in L2ers and HSs of Spanish who share English as their dominant language. We aimed to assess whether there are differences between these two adult speaker groups and/or differences between these groups and Spanish-dominant NSs. We also aimed to assess what factors predict priming of Spanish periphrastic and *se*-passives. We found that all groups showed immediate priming effects of both passives by both passive types, suggesting that immediate priming is not modulated by target language frequency or shared structures in bilingual systems – neither passive type was a more likely prime than the other but rather both showed immediate priming effects. In regard to persistent priming effects, we found that while NSs and HSs showed persistent priming effects with both structures, the L2ers only showed persistent priming effects with *se*-passives, supporting previous studies that suggest that target language frequency modulates priming in the L2 such that the higher frequency L2 structure will show greater priming effects regardless of the

structure's availability or not in the L1 (Hurtado & Montrul, 2021). We did not find that accuracy in the receptive task predicted productions in the priming task.

We also aimed to assess L2ers' and HSs' knowledge of both Spanish passives in a receptive task with the goal of assessing what predicts 'native-like' performance in the receptive task. We find evidence of positive transfer from the dominant language (English) such that both English-dominant groups performed at ceiling on the periphrastic passive. It is not the case that these groups would be exposed to many periphrastic passives in their Spanish input but rather this structure is directly mappable from the L1/dominant English to the L2/non-dominant Spanish. Frequency, on the other hand, did not predict performance in the receptive task: while HSs performed at ceiling on both structures, the L2ers showed instability in their knowledge of *se*-passives specifically, despite this being the higher frequency structure. We did not find that proficiency predicted performance in the problematic condition for L2ers, which suggests that the more important factor in acquisition of these structures is age of acquisition: the HSs outperformed the L2ers due to an early exposure advantage, despite sharing the same dominant language – English.

To summarize, we found that all three speaker groups show similar patterns of production of Spanish periphrastic and *se*-passives in a structural priming task, though persistent priming effects in the L2 group appeared only with the higher frequency *se*-passive. Further, we found that while HSs and NSs converge in their receptive abilities with these structures, L2ers show instability in their knowledge of *se*-passives specifically when compared to their knowledge of periphrastic passives, with which they performed at ceiling. This difference in productive and receptive knowledge in L2ers could be attributed to the idea that adult L2ers may use domain general abilities to compensate for their lack of native-like abstract representations, particularly

when participating in a production task such as priming. The question remains – why do L2ers show difficulties with *se*-passives? It could be structure specific, an issue caused by the *se*-passive not existing in the dominant language, or the clitic *se*'s highly multifunctional nature.

Overall, we find an early exposure advantage for HSs with the *se*-passive when compared to L2ers, which supports Partial Access accounts of language acquisition which indicate that after the Sensitive Period, the language learner only has access to UG as filtered through their L1, predicting difficulties with functional features not instantiated in the L1 (Hawkins & Chan, 1997; Hawkins et al., 2004; Tsimpli & Mastropavlou, 2007; a.o.). Our results do not preclude, however, the possibility that there is actually a difference in the L2ers by proficiency, given that we only measured one domain of proficiency (lexical recognition) and our small sample size and small variability did not allow for appropriate statistical power to include the proficiency measure in a predictive way in all our models or to divide L2ers into discrete categories. If future research uncovers a difference modulated by proficiency, this would then support Lardiere's (2005) Feature Reassembly Hypothesis, which predicts that L2ers will struggle with functional features not instantiated in the L1 at the earlier stages of language acquisition but that ultimate attainment is indeed possible. On the other hand, our adult L2 speakers' success with these structures may be the result of domain general cognitive abilities, which would correlate with performance on priming and receptive tasks if they are the driving force behind L2ers' success with these structures.

Lastly, we offer the first study to directly compare speakers' knowledge and production of both Spanish passive types. We confirm that L2ers, HSs, and NSs can all be primed with both Spanish passive types and that persistent priming effects in the L2 do indeed seem to be modulated by frequency. Our findings also demonstrate the importance of comparing productive and

receptive data when assessing bilingual grammars and linguistic competence. We find evidence for age of acquisition effects in the acquisition of *se*-passives in Spanish, suggesting that functional elements may be more difficult to fully acquire after the Sensitive Period, as has been suggested in previous research. We uncover several fruitful areas for future research including the investigation of other multifunctional elements in L2, including an independent measure of analogic-based IQ in L2 priming studies, probing speakers' grammars further with ERP, and the potential for exploring more areas where HSs converge with target language dominant NSs. Importantly, despite L2ers overall good performance, they did not fully converge with NS's performance. On the other hand, HSs did show robust knowledge of both passive structures, suggesting convergence with NSs in the morphosyntactic domain. These results thus contribute to the growing body of evidence suggesting that L2ers and HSs have distinct instructional needs and linguistic strengths.

Appendix A

Experiment 1 - Instructions and Sample Stimuli

Baseline Phase


Instructions

◀

Fase 1
Instrucciones: Vas a ver unas imágenes y un verbo. Describe lo que pasó en las imágenes con el verbo dado en una frase simple.

Ejemplo

▶ ◀ ◀



▶

correr

Audio: *Tengo esta imagen, el verbo 'correr', la boca quiere decir que debes hablar y digo, 'El hombre corrió por el parque', algo así.*

Stimuli

Type	Verb	Argument(s)	Visibility of Agent
Transitive	abrir 'open'	las puertas 'the doors'	none
Transitive	lavar 'wash'	los carros 'the cars'	none
Unaccusative	crecer 'grow'	las plantas 'the plants'	NA


Transitive	comprar 'buy'	los hombres 'the men' las joyas 'the jewelry'	whole
Transitive	limpiar 'clean'	las alfombras 'the rugs'	none
Transitive	leer 'read'	las mujeres 'the women' los manuals 'the manuals'	hands
Unaccusative	desaparecer 'disappear'	los dibujos 'the drawings'	NA
Transitive	editar 'edit'	los trabajos 'the papers'	none
Transitive	transportar 'transport'	los hombres 'the men' los pianos 'the pianos'	whole
Unergative	patinar 'skate'	la mujer 'the woman'	whole
Transitive	componer 'compose'	las canciones 'the songs'	none


Priming Phase

Instructions


Fase 2


Instrucciones: Vas a ver unas imágenes y escuchar y ver una oración describiéndolas.
Después vas a ver unas imágenes y un verbo. Describe lo que pasó en las imágenes con el verbo dado en una frase. Cuando veas una pregunta, di tu respuesta en voz alta.





Hay una **boca** cuándo debes decir algo...





...y una **oreja** cuándo debes escuchar.

Sample Stimuli – List A

Type	Condition	Subcondition	Stimulus	Visibility of Agent
Prime	Filler	Unaccusative	Los alumnos llegaron a clase. 'The students arrived to class.'	body
Production	Filler	Unaccusative	nacer 'to be born'	NA
Prime	Passive	Se	Los balcones se adornaron para el carnaval. 'The balconies were adorned for Carnaval.'	none
Comprehension	Comprehension	(Se)	¿De qué hablaron? De: A. adornar balcones/B. adornar calles	NA
Production	Transitive	(Se)	devolver 'to return'	none
Prime	Control	Active	El técnico creó los programas para el banco. 'The technician created the programs for the banks.'	hands
Comprehension	Comprehension	(Active)	¿De qué hablaron? De: A. bajarse programas/B. crear programas	NA
Production	Control	(Active)	producir 'to produce'	hands
Prime	Passive	Periphrastic	Los carteles fueron colgados en el cine. 'The posters were hung in the movie theater.'	body
Production	Transitive	(Periphrastic)	imprimir 'to print'	body
Prime	Filler	Unergative	La cantante bailó en el concierto. 'The singer danced at the concert.'	body
Production	Filler	Unergative	nadar 'to swim'	body
Prime	Passive	Periphrastic	Los árboles fueron cortados para la construcción. 'The trees were cut for the construction.'	none
Production	Transitive	(Periphrastic)	pagar	none

			'to pay'	
Prime	Control	Active	Los invitados mancharon el mantel. 'The guests stained the tablecloth.'	none
Comprehension	Comprehension	(Active)	¿De qué hablaron? De: A. manchar manteles/B. poner manteles	NA
Production	Control	(Active)	abandonar 'to abandon'	none
Prime	Passive	Se	Los muros se pintaron para el mundial. 'The walls were painted for the World Cup.'	hands
Production	Transitive	(Se)	arreglar 'to fix'	hands
Prime	Filler	Unaccusative	La carta reapareció en sus manos. 'The card reappeared in their hands.'	hands
Production	Filler	Unaccusative	flotar 'to float'	NA
Prime	Passive	Periphrastic	Los anuncios fueron publicados en el diario. 'The announcements were published in the newspaper.'	none
Production	Transitive	(Periphrastic)	pegar 'to stick'	none
Prime	Control	Active	El niño arruinó los pantalones. 'The child ruined his pants.'	hands
Comprehension	Comprehension	(Active)	¿De qué hablaron? De: A. arruinar pantalones/B. arruinar camisetas	NA
Production	Control	(Active)	regar 'to water'	hands
Prime	Passive	Se	Los muebles se vendieron en el patio. 'The furniture was sold on the patio.'	none
Comprehension	Comprehension	(Se)	¿De qué hablaron? De: A. vender muebles/escoger muebles	NA

Production	Transitive	(Se)	decorar 'to decorate'	none
Prime	Filler	Unergative	Los artistas cantaron en el espectáculo. 'The artists sang in the show.'	body
Production	Filler	Unergative	reír 'to laugh'	body
Prime	Passive	Se	Los cuadros se robaron en el museo. 'The paintings were stolen at the museum.'	body
Production	Transitive	(Se)	utilizar 'to use'	body
Prime	Control	Active	Los fanáticos celebraron el triunfo. 'The fans celebrated the win.'	body
Comprehension	Comprehension	(Active)	¿De qué hablaron? De: A. disputar el triunfo/B. celebrar el triunfo	NA
Production	Control	(Active)	cerrar 'to close'	body
Prime	Passive	Periphrastic	Los fósiles fueron encontrados en el desierto. 'The fossils were found in the desert.'	none
Comprehension	Comprehension	(Periphrastic)	¿De qué hablaron? De: A. encontrar minerales/B. encontrar fósiles	NA
Production	Transitive	(Periphrastic)	borrar 'to erase'	none
Prime	Filler	Unaccusative	Los gatitos nacieron en la calle. 'The cats were born in the street.'	NA
Production	Filler	Unaccusative	llegar 'to arrive'	NA
Prime	Passive	Se	Los trabajos se imprimieron en el despacho. 'The papers were printed in the office.'	none
Production	Transitive	(Se)	colgar 'to hang'	none

Prime	Control	Active	El farmacéutico produjo los medicamentos en el laboratorio. 'The pharmacist produced the medicines in the laboratory.'	body
Comprehension	Comprehension	(Active)	¿De qué hablaron? De: A. tomar medicamentos/B. producir medicamentos	NA
Production	Control	(Active)	crear 'to create'	body
Prime	Passive	Periphrastic	Los libros fueron devueltos a la biblioteca. 'The books were returned to the library.'	none
Comprehension	Comprehension	(Periphrastic)	¿De qué hablaron? De: A. devolver llaves/devolver libros	NA
Production	Transitive	(Periphrastic)	adornar 'to adorn'	none
Prime	Filler	Unergative	El perro nadó en el lago. 'The dog swam in the lake.'	body
Production	Filler	Unergative	bailar 'to dance'	body
Prime	Passive	Periphrastic	Los ordenadores fueron arreglados en la tienda. 'The computers were fixed at the store.'	body
Production	Transitive	(Periphrastic)	pintar 'to paint'	body
Prime	Control	Active	Los criminales abandonaron el apartamento por la ventana. 'The criminals abandoned the apartment through the window.'	body
Production	Control	(Active)	manchar 'to stain'	body
Prime	Passive	Se	Los recibos se pagaron con el celular. 'The bills were paid by phone.'	none
Production	Transitive	(Se)	cortar 'to cut'	none
Prime	Filler	Unaccusative	El baúl flotó en el mar.	NA

			'The boat floated in the ocean.'	
Production	Filler	Unaccusative	reaparecer 'to reappear'	NA
Prime	Passive	Periphrastic	Los pastelitos fueron decorados para el banquete. 'The cupcakes were decorated for the banquet.'	none
Production	Transitive	(Periphrastic)	vender 'to sell'	none
Prime	Control	Active	El señor regó los arbustos. 'The man watered the bushes.'	none
Comprehension	Comprehension	(Active)	¿De qué hablaron? De: A. regar arbustos/B. regar campos	NA
Production	Control	(Active)	arruinar 'to ruin'	none
Prime	Passive	Se	Los dibujos se pegaron al refrigerador. 'The drawings were stuck to the refrigerator.'	none
Production	Transitive	(Se)	publicar 'to publish'	none
Prime	Filler	Unergative	Los hombres rieron en el bar. 'The men laughed at the bar.'	body
Production	Filler	Unergative	cantar 'to sing'	body
Prime	Passive	Se	Los apuntes se borraron del documento. 'The notes were erased from the document.'	none
Production	Transitive	(Se)	encontrar 'to find'	none
Prime	Control	Active	Los pasajeros cerraron las ventanas en el viaje. 'The passengers closed the windows on the trip.'	hands
Production	Control	(Active)	celebrar 'to celebrate'	hands
Prime	Passive	Periphrastic	Los cupones fueron utilizados en la caja. 'The coupons were used at the cash register.'	none

Production	Transitive	(Periphrastic)	robar 'to steal'	none
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Post-Test Phase


Stimuli

Type	Verb	Argument(s)	Visibility of Agent
Unergative	saltar 'to jump'	los niños 'the children'	whole
Transitive	construir 'to build'	los edificios 'the buildings'	none
Transitive	tirar 'to throw away'	los restos 'the leftovers'	none
Unaccusative	resbalar 'to fall'	los patinadores 'the skaters'	NA
Transitive	escribir 'to write'	la gente 'the people' los mensajes 'the messages'	hands
Transitive	preparar 'to prepare'	los platos 'the dishes'	none
Transitive	bajar 'to lower'	la mujer 'the woman' los libros 'the books'	whole
Unaccusative	volver 'to return'	los niños 'the children'	NA
Transitive	firmar 'to sign'	los contratos 'the contracts'	none
Transitive	seleccionar 'to select'	las mujeres 'the women' los vinos 'the wine'	whole
Transitive	destruir 'to destroy'	los puentes 'the bridges'	none
Unergative	llorar 'to cry'	los bebés 'the babies'	whole

Appendix B

Experiment 2 – Instructions and Sample Stimuli

Instructions screen 1:




progress

En este experimento, vas a escuchar y leer unas oraciones en español. Después, vas a decir si son aceptables ('SÍ') o no aceptables ('NO').

Usa el ratón para seleccionar tus respuestas. Los juicios deben ser de tu intuición. Tienes 3 segundos después de que termine el audio para decidir.

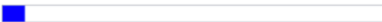
Instructions screen 2:


progress

¡Ojo! ¡Debes prestar mucha atención porque a veces un detalle MUY pequeño en mitad de la oración la hace NO aceptable!

Haz clic para seguir

Instructions screen 3:


progress


Vamos a practicar un poco. Por ejemplo, veamos la oración que tenemos aquí:

'La niña saltó en el trampolín.'

Esta oración **SÍ** debería ser aceptable porque es algo que podrías oír en un hablante nativo. Por favor, selecciona **SÍ**.

Haz clic para seguir

Sample grammatical training trial:


progress

La niña saltó en el trampolín.

¿Es esta oración aceptable?

es aceptable *no es aceptable*

Haz clic, SÍ o NO

Sample ungrammatical training trial part I:


progress


Por otra parte, veamos la oración que tenemos aquí:

'El chico**s** bostezó durante la película.'

Esta oración NO debería ser aceptable porque es algo que no oirías nunca en un hablante nativo. Por favor, selecciona **NO**.

Haz clic para seguir

Sample ungrammatical training trial part II:


progress

El chicos bostezó durante la película.

¿Es esta oración aceptable?

es aceptable

no es aceptable

Haz clic, SÍ o NO

Final feedback in training section:


progress

¡Ojo! Durante el experimento, los errores no estarán en rojo. ¡Debes prestar mucha atención porque a veces un detalle MUY pequeño en mitad de la oración la hace NO aceptable!

Haz clic para seguir

Sample Stimuli

Version A:

Type	Verb	Order	Grammaticality	Sentence
example	saltar	SV	G	La niña saltó en el trampolín.
example	bostezar	SV	U	El chicos bostezó durante la película.
example	entrar	VS	G	Entró el director en aquel momento.
example	volver	VS	U	Volvió la doctoras de vacaciones.
Se	utilizar	VS	G	Durante la tarde, se utilizaron los aparatos en el laboratorio.
Active	comprar	SV	U	El novio compró las pulseras en el joyería hace dos semanas.
Short	publicar	VS	U	El mes pasado, fuimos publicados los cuentos en el circular.
Se	escribir	SV	G	Los artículos se escribieron para el concurso la primavera pasada.
Short	pegar	VS	G	Durante la semana, fueron pegados los recibos en la libreta.
Se	robar	SV	U	Los cuadros se robamos en el museo la noche pasada.
Active	limpiar	VS	U	La sala la limpió la criada para el fiesta el viernes pasado.
Unaccusative	desaparecer	SV	G	Los extraterrestres desaparecieron en la niebla hace una semana.
Unergative	bailar	SV	U	Los actores bailaron en la concurso la noche pasada.
Short	borrar	VS	G	La semana pasada, fueron borrados los archivos según el plan.
Se	cortar	VS	U	Por la mañana, se cortamos los arbustos en el campus.
Short	pintar	SV	U	Los muros fuimos pintados para el mundial el verano pasado.
Active	cerrar	VS	G	La puerta la cerró la profesora para el entrenamiento durante la tarde.
Short	arreglar	SV	G	Los carros fueron arreglados en el taller antes del viernes.
Unergative	correr	VS	U	Durante el mañana corrió el olímpico por el parque.
Active	producir	SV	G	Los operarios produjeron los juguetes en la fábrica toda la semana.
Short	construir	VS	U	El otoño pasado, fuimos construidos los edificios en el descampado.

Se	vender	SV	G	Los muebles se vendieron en el patio el otro domingo.
Active	abrir	SV	U	El alumno abrió las ventanas del salón para el cena.
Se	realizar	VS	U	Durante la primavera, se realizamos los experimentos a temperature ambiente.
Unaccusative	flotar	SV	U	El muñeco flotó en la piscina toda el mañana.
Active	editar	VS	G	Los trabajos los editaron los estudiantes para la conferencia.
Unaccusative	crecer	VS	U	El primavera pasada, crecieron las cosechas en el campo.
Short	colgar	SV	U	Los carteles fuimos colgados en el cine hace tres meses.
Unergative	cantar	VS	G	En el verano, cantaron las artistas en el festival.
Se	crear	SV	U	Los programas se creamos para el banco el año pasado.
Active	lavar	SV	G	Los empleados lavaron la cortina la lavandería el mes pasado.
Se	encontrar	VS	G	El lunes pasado, se encontraron los anillos en el escondite.
Unergative	patinar	SV	G	La niña patinó en la pista el lunes pasado.
Active	celebrar	VS	U	El compromiso lo celebraron las familias en la fiesta el semana pasada.
Unaccusative	llegar	VS	G	En el último minuto, llegó la doctora a la operación.
Short	imprimir	SV	G	Los trabajos fueron imprimidos en el despacho a última hora.
Unaccusative	crecer	SV	G	Las plantas crecieron en el jardín la primavera pasada.
Active	comprar	VS	G	Las joyas las compró el marido en el centro comercial el domingo pasado.
Se	pegar	SV	U	Los dibujos se pegamos en el aula el último día.
Active	limpiar	SV	G	La muchacha limpió la alfombra en el patio por la tarde.
Unaccusative	desaparecer	VS	U	La noche pasada, desaparecieron los magos durante la espectáculo.
Unergative	cantar	SV	U	Las chicas cantaron en el bar durante el fiesta.
Se	arreglar	VS	U	Hace tres días, se arreglamos los camiones en el garaje.

Short	realizar	SV	G	Los cambios fueron realizados según el contrato el último mes.
Unergative	bailar	VS	G	Esa noche, bailaron los jóvenes en la fiesta.
Se	construir	SV	G	Los complejos se construyeron en el centro durante el verano.
Active	producir	VS	U	Los medicamentos los produjeron los farmacéuticos en la laboratorio esta mañana.
Se	colgar	VS	G	El jueves pasado, se colgaron los folletos en el tablón.
Short	vender	VS	U	El sábado pasado, fuimos vendidos los electrodomésticos en el foro.
Active	editar	SV	U	Las profesoras editaron los manuscritos para la congreso ayer.
Se	pintar	VS	G	Hace tres años, fueron pintados los cuadros para el museo.
Unaccusative	llegar	SV	U	La profesora llegó a la clase en la momento preciso.
Short	crear	VS	G	Hace dos años, fueron creados los juegos para el casino.
Active	celebrar	SV	G	Los jóvenes celebraron el fin del año en el bar el sábado pasado.
Short	utilizar	SV	U	Los cupones fuimos utilizados en el cajero el día veinte.
Unergative	correr	SV	G	El niño corrió por el pasillo toda la mañana.
Short	escribir	VS	U	El verano pasado, fuimos escritos los reportajes para el documental.
Active	cerrar	SV	U	La alumna cerró la ventana en la segundo piso hace dos minutos.
Se	publicar	SV	G	Los anuncios se publicaron en el diario la semana pasada.
Short	robar	VS	G	Durante el evento, fueron robados los aretes en el robo.
Active	lavar	VS	U	El carro lo lavaron los hombres en el patio la otro sábado.
Short	cortar	SV	G	Los árboles fueron cortados en el jardín la otra semana.
Se	imprimir	VS	U	El día antes, se imprimimos los papeles en el locutorio.
Unaccusative	flotar	VS	G	Todo el verano flotó el baúl en el mar.
Short	encontrar	SV	U	Los diamantes fuimos encontrados en el congelador el otro día.

Active	abrir	VS	G	Las puertas de las tiendas las abrió el trabajador por la mañana.
Se	borrar	SV	U	Los datos se borramos según el reglamento el martes pasado.
Unergative	patinar	VS	U	El mes pasado, patinó la atleta en la concurso.

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