COMPREHENSION OF SPANISH RELATIVE AND PASSIVE CLAUSES BY EARLY BILINGUALS AND SECOND LANGUAGE LEARNERS

BY

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DISSERTATION

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ABSTRACT

This study investigated comprehension of complex syntax in Spanish, namely passive and relative clauses, by early English-Spanish bilinguals, also known as heritage language (HL) learners, and by second language (L2) learners. To contribute to current theoretical debates on the role of input and age in L2 and bilingual language acquisition, and to current pedagogical inquires on how instruction can be beneficial for HL learners, this study sought to find out whether age of onset of meaningful exposure (and consequently type of L2/HL input and experience) affected adult L2 learners and heritage speakers' knowledge of these structures, which are acquired early (by age 3 or 4) but are most frequently used and mastered at a later age during the school-age period. This study also investigated whether language learning experience, for late bilinguals after adolescence as a second language (L2) in a classroom; for early bilinguals, from birth as heritage language (HL) in informal familiar settings, affect their performance in tasks of oral and written modalities. Given that these structures are mastered during the school-age period, this study also focuses on how instruction in Spanish from pre-K to graduate school affect comprehension of these clauses.

Relative clauses are embedded clauses that modify a noun phrase (NP), the head of the main clause, which in this study were either in the subject or in the object position. In Spanish, relative clauses involve a type of *wh*-movement where a special null *wh*-word referred to as an operator (Op) in the deep structure moves to the Spec of the CP. When the operator moves, it leaves a trace or a gap within the clause. Although many factors affect processing of relative clauses, it is generally agreed that the linear distance (LD) between the head and the gap accounts for the ease or difficulty processing subject relative and object relative clauses, at least in head-initial languages. The relative clauses in this study were subject and object relative

clauses with inanimate NPs and reversible and plausible contexts in which either the subject or the object could perform the action described by the verb in the complementizer phrase (CP). The sentences were designed to control for plausibility to prevent a context bias favoring one interpretation or another. The only way for the learners to determine which NP was the subject or the object in the clause was by processing the inflectional morphology of the verb that agreed with the subject. Only third person singular and plural verb conjugations were used.

In examples (1) and (2) the linear distance in words between the head and the gap is shorter in the subject relative clause than in the object relative clause.

(1) Subject Relative Clause (SR)

The submarine$_{\text{SUBJECT}}$ that ___ sank$_{\text{VERB}}$ the boats$_{\text{OBJECT}}$. LD = 1 word

(2) Object Relative Clause (OR)

The submarine$_{\text{OBJECT}}$ that the boats$_{\text{SUBJECT}}$ sank$_{\text{VERB}}$ ____. LD = 4 words

While English relatives are constructed with one word order, Spanish relatives can be constructed with two, showing different linear distances between the head and the gap. Relative clauses in examples (3) and (4) have the same word order as English relative clauses.

(3) SR *El submarino*$_{\text{SUBJECT}}$ *que* ____ *hundió*$_{\text{VERB}}$ *los barcos*$_{\text{OBJECT}}$. LD = 1 word

(4) OR *El submarino*$_{\text{OBJECT}}$ *que los barcos*$_{\text{SUBJECT}}$ *hundieron*$_{\text{VERB}}$ ____. LD = 4 words

And examples (5) and (6) show the other possible word order for SR, with Verb-Object inversion, and for OR, with Subject-Verb inversion, respectively. The SR in (5) is extremely rare in the input.

(5) SR *El submarino*$_{\text{SUBJECT}}$ *que los barcos*$_{\text{OBJECT}}$ ____ *hundió*$_{\text{VERB}}$. LD = 3 words

(6) OR *El submarino*$_{\text{OBJECT}}$ *que hundieron*$_{\text{VERB}}$ ____ *los barcos*$_{\text{SUBJECT}}$. LD = 2 words

Object relatives OR (OSV) were expected to be harder to comprehend than SR (SVO) based on the linear distance between the head and the gap. Furthermore, the ease of comprehension of relative clauses was expected to vary based on the LD in words in the following manner: SR(SVO) >OR(OVS)>SR(SOV>OR(OSV), where '>' means 'easier than'.

The other structure tested was passive clauses. Passive clauses included verbal and adjectival passive clauses with the copulas in the imperfect tense *era* and *estaba*, respectively. See (7) and (8). Comprehension of verbal passive clauses, as opposed to the comprehension of adjectival passive clauses, was predicted to be more difficult for both groups of leaners. First, there is a canonical construction for the verbal passive clause in the past with the copula in the preterite tense *fue,* with which learners are more familiar. Second, another passive voice construction, the reflexive passive, also known as morphological passive or *se*-passive, is more frequent in Spanish. Third, the verbal passive clause with the copula in the imperfect tense in HL and L2 acquisition is not common in oral communication. And, last, the imperfect tense is vulnerable to incomplete acquisition in L2 and HL learners' grammars.

This study was designed with truncated passive clauses with actional verbs and irreversible contexts, meaning that the theme could not perform the action stated by the verb. Instead the theme was always the object of, or was in a state resulting from the action stated by the verb.

(7) La comida estaba servida. *Adjectival/ Stative Passive*
dinner was (estar.IMPERFECT) served.
'Dinner was served.'

(8) La comida era servida. *Verbal/Eventive Passive*
dinner was (ser.IMPERFECT) served.
'Dinner was being served.'

Unlike adjectival passives, verbal passive clauses trigger a reanalysis of the sentence to organize the thematic roles. To comprehend adjectival/stative passives with participles, learners

had to realize that a description of a state or final result followed the copula *estar*. To comprehend verbal passive clauses, learners had to know that the first noun phrase was not the agent, but the object. The reanalysis is triggered at the past participle in English (Mack, Meltzer-Asscher, Barbieri, & Thompson, 2013). In this dissertation it is assumed that Spanish reanalysis involves the copula. If the copula was *ser*, the clause was a verbal passive not an adjectival passive. When processing the copula, learners had to integrate the meaning of the imperfect form *era*, which refers to an ongoing or habitual action in the past. L2 and HL learners are familiar with passive voice structures and they have been shown to be familiar with the canonical passive clause with *fue* in Spanish. Thus, comprehension of these passive clauses required not only knowledge of its syntax, but also of the complementary distribution of *ser* and *estar*. Acquiring the complementary distribution of the copulas is a hard task for L2 learners and HL learners as they need to acquire not only their irregular inflectional morphology but also the contrasts between each copula regarding syntax, semantics and pragmatics, a contrast that is not present in English.

116 participants completed an aural and a written version of a Picture Matching Task created to test comprehension of these clauses. They also completed an aural and written version of a Grammaticality Judgment Task to test basic grammar knowledge needed to comprehend these structures, and their linguistic history was recorded in a bilingual language questionnaire. Their proficiency was measured with a written test (DELE) and an oral narrative coded to calculate the moving average type-token ratio (MATTR), mean length of utterance (MLU) and fluency in words per minute.

Results showed that SR(SVO) and OR(OSV) were both easily comprehended by both groups of learners. The fact that SR(SVO) and OR(OSV) show the same word order as their

English counterparts might explain the result. A study with speakers of another L1 with different word order (i.e. Chinese, Korean, Turkish) would be needed to confirm this possibility with more certainty. Contrary to the prediction based on the LD, comprehension of SR(SOV) was low, which is explained by how infrequent they are in the input. OR (OVS) were interpreted as SR (SVO) by L2 and HL learners of lower proficiency. As written DELE proficiency increased so did correct interpretation of OR(OVS) for HL and L2 learners. The prediction based on the LD was not borne out and highlights the importance of extra-linguistic factors in the comprehension of these clauses. Frequency of the structure affects comprehension of relative clauses, and so does written and oral proficiency.

Results for passive clauses showed that L2 and HL learners were more accurate with adjectival passive clauses than with verbal passive clauses. These difficulties in the comprehension of verbal passive clauses show that learners have not yet acquired the full spectrum of copula uses and interpreted *era* in the verbal passive clause as *estaba* in an adjectival passive clause, a simpler construction.

Besides comprehension of these structures, this study investigated how age of meaningful exposure to Spanish, modality of task, and instruction in the HL/L2 language from pre-K to graduate school affected comprehension of these clauses.

Results from the comprehension of passive and relative clauses show age of meaningful exposure to Spanish as a robust predictor of successful language acquisition. HL learners were significantly more accurate than L2 learners in the comprehension of passive clauses and significantly more accurate in the comprehension of the object relative clause OR-OVS. This indicates that early exposure to Spanish confers HL learners an advantage in the comprehension of clauses with complex syntax.

Regarding task modality, L2 and HL learners' linguistic experience influences their abilities with language tasks because each experience emphasizes different language skills (Bowles, 2011b; Montrul, 2016). L2 learners' meaningful exposure to Spanish in the classroom helps them develop metalinguistic or explicit knowledge of the language, and hence they tend to perform well in tasks that target metalinguistic knowledge. HL learners also have limited meaningful exposure to the language, but their exposure is mostly aural in informal settings with family and community. They do not have significant experience writing or reading the HL, and, typically do not have metalinguistic knowledge of the HL (Montrul, 2008b, 2016). Because their experience with the language is mostly aural, they tend to perform better in aural tasks that tap on implicit knowledge, or on intuitive information (Bowles, 2011a; Montrul, Foote, & Perpiñán, 2008a; Montrul & Perpiñán, 2011). Results showed that modality affected comprehension of both groups of learners but with different clauses. L2 learners performed significantly better in the written modality with relative clauses, while HL learners performed significantly better in the aural modality with passive clauses.

This thesis also focused on how instruction interacted with age of meaningful exposure in the acquisition of complex syntax. Results showed that instruction significantly accounted for L2 learners' comprehension of passive clauses, but not for comprehension of relative clauses. Although instruction did not account for HL learners' comprehension of any of the clauses, an important finding of this dissertation is that instruction in Spanish could be more fruitful for HL learners if it starts in elementary school. Early instruction and language use at an early age conferred advantages to HL learners in the comprehension of verbal passive clauses with *era*. The data suggested that parental Spanish use with learners (input), combined with learners' Spanish language use with parents (output), and early frequent Spanish use (between the ages of

6 and 10) positively influenced comprehension of verbal passive clauses with *era.* Moreover, the data suggested that early bilingual education could be a contributing factor too.

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CHAPTER 1: INTRODUCTION

This study investigates comprehension of complex syntax in Spanish, namely passive and relative clauses, by early English-Spanish bilinguals, also known as heritage language (HL) learners, and by second language (L2) learners. To contribute to current theoretical debates on the role of input and age in L2 and bilingual language acquisition, and to current pedagogical inquires on how instruction can be beneficial for HL learners, this study seeks to find out whether age of onset of meaningful exposure to Spanish (and consequently type of L2/HL input and experience) affects adult L2 learners and heritage speakers' knowledge of these structures of later language development that are acquired early (by age 3 or 4) but are mastered and fully developed at a later age during the school-age period.

The main goal of studying second and heritage language (L2 and HL, respectively) acquisition is to understand the linguistic knowledge that L2 learners and HL speakers acquire, develop and use in the basic language skills (i.e. listening, speaking, reading and writing). Although L2 and HL acquisition is characterized by non-convergence with monolingually raised native speaker norms, L2 and HL do show native-likeness in some linguistic domains. For instance, while L2 learners do not often reach native-like ability in the L2 phonology, HL learners approximate native speakers in many aspects of phonology (T. K. Au, Knightly, Jun, & Oh, 2002; Kim, 2019). And L2 and HL learners are also able to acquire some aspects of syntax in the L2/HL. Age of meaningful exposure is assumed to be a robust predictor of successful second language (L2) acquisition. But age is certainly not the only factor involved in successful L2 and HL acquisition. Many factors can potentially affect acquisition and development of the L2/HL. Quantity, quality and modality of input, and learners' previous linguistic knowledge, language dominance, and proficiency play a role in this process as well. To understand the

differences in L2 and HL acquisition and development it is necessary to understand what factors interact with maturational constraints in L2/HL acquisition and development later in life. To that effect, this thesis focuses on how instruction and input/exposure interact with age of meaningful exposure in the acquisition of complex syntax.

The focus on input effects consists of studying how limited, but completely different, input in Spanish affects knowledge of complex syntax (passive and relative clauses) in L2 and HL learners. Data from this study contribute to understand how acquiring the language late, in a classroom setting or early, in a naturalistic environment, affects acquisition of complex syntax. Moreover, it sheds light on how instruction and proficiency in Spanish are related to acquisition and development of these clauses in the two groups of learners. This point is particularly important because these are structures that emerge early in the acquisition process, but are mastered later with schooling. Indeed, it has been shown that passive clauses are mastered after exposure to written language. Among other things, this study seeks to find out how important Spanish instruction is in the acquisition of these clauses.

While trying to understand what the linguistic systems of L2 learners and heritage speakers look like as they develop, we also need to understand how the research methods employed to investigate their linguistic knowledge impact our understanding of their linguistic systems. Heritage speakers tend to perform better in aural tasks while L2 learners tend to perform better in written tasks (Bowles, 2011a; Montrul et al., 2008a; Torres, 2018). To collect thorough behavioral data of the L2 and HL learners' current linguistic representation of verbal passives and relative clauses, this study uses a linguistic task that measures comprehension of sentence-level meaning and another that measures learners' evaluation of sentence grammaticality in aural and written modalities. Proficiency is determined with a dual modality

approach. A standardized written measure and an oral narrative were administered. The oral narrative was analyzed for lexical diversity, grammatical complexity, fluency and errors. A bilingual language questionnaire was also administered to collect information about the learners' linguistic background, including a self-assessment of their abilities in English and Spanish in the four basic language skills; and, crucially, to find out about their Spanish instruction experience.

The focus on comprehension of complex syntax constitutes a good way to investigate the syntactic representation that these learners have acquired of these structures, and also the way these learners have organized and analyzed their grammatical knowledge based on the frequency, complexity and pragmatic use of relatives and passive clauses.[1] Since L2/HL's acquisition of complex syntax has not been studied in much detail compared to other early acquired areas of grammar have been (Montrul, 2018), by investigating comprehension of relative and passive clauses by HL and L2 learners this study seeks to fill in this gap and contribute to current L2 and HL theories of acquisition.

Subject and object relative clauses (SR and OR, respectively) in Spanish feature two word orders that convey the same meaning. To correctly comprehend the relative clauses, learners have to pay attention to the inflectional morphology on the verb that distinguishes the object from the subject. One word order of the subject relative clauses (SR) is frequent and matches the word order of the English subject relative clauses which is SR S(VO), *El submarino*$_{[subject]}$ *que hundió*$_{[verb- PRET SING]}$ *los barcos*$_{[object]}$ *(*'the submarine$_{[subject]}$ that sank$_{[verb- PRET SING]}$ the boats$_{[object]}$'). The other word order does not match the word order of the English subject relative and is restricted to formal and creative discourses. It has an verb-object inversion that is unusual

[1] Diessel (2004), investigating acquisition of complex clauses in English, explained that frequency, complexity and pragmatic use are important factors in the acquisition of complex clauses. I assume this can also be applied to L2 acquisition of relative clauses and passive clauses (especially the factor 'pragmatic use' because opting to use a passive clause is based on a pragmatic choice).

is Spanish, S(OV), with the object preceding the verb (*el submarino*$_{[subject]}$ *que los barcos*$_{[object]}$ *hundió*$_{[V- PRET SING]}$ *(*'the submarine$_{[subject]}$ that the boats$_{[object]}$ sank$_{[V- PRET SING]}$'). Typically, sentences that are constructed with a verb at the end are for emphasis or for verse rhythm in poetry or rhythmical sayings such as *A buen entendedor, pocas palabras*$_{subject}$ *bastan*$_{verb}$, *'A word to the wise is enough'.*

Object relative clauses (OR) in Spanish also feature two word orders that convey the same meaning, one with subject-verb inversion or O(VS) (e.g. *El submarino que hundieron los barcos* 'the submarine$_{[object]}$ that sank$_{[V- PRET PLU]}$ the boats$_{[subject]}$') and one without it, O(SV), which matches the word order of English object relatives, *El submarino que los barcos hundieron* 'the submarine$_{[object]}$ that the boats$_{[subject]}$ sank$_{[verb- PRET PLU]}$'. The object relative with SV inversion, O(SV), is the preferred or unmarked word order in Spanish, but both word orders occur in the language. The SV inversion is not syntactically regulated, other factors trigger it (i.e. pragmatic, phonological). To my knowledge, there is no reliable data on the comprehension of these clauses by L2 and HL learners. Only one study has investigated comprehension of object relative clauses with and without subject-verb inversion in HL learners, but its results were inconclusive as the instruments used only 4 items with confounding contexts (Perpiñán & Moreno-Villamar, 2013). Nonetheless, one study of Spanish speakers from Spain, who grew up in a monolingual environment and had been living in the U.S. on average five years, showed that these native speakers preferred to produce object relative clauses without SV inversion, OR O(SV), the 'dispreferred' word order. This is different from what the native speakers, who grew up in a monolingual environment and continued to live in Spain, who produced them with O(VS) order

(Perpiñán, 2011).[2] While the data showed that the native speakers preferred to produce OR O(SV) word order, it also showed that they accurately comprehended both O(SV) and O(VS) word orders. Perpiñán suggested that this area of grammar might be susceptible to language loss (emerging optionality or underspecification) in monolingual speakers, which therefore implies that this is a vulnerable area of grammar.

Since the word order of English object relative clauses is O(SV), the O(SV) preference by Spanish native speakers who were raised monolingual and now reside in the U.S. could be due to L2 transfer. Considering that all native speakers in the Perpiñán study who grew up monolingually comprehended the object relatives with word orders O(SV) and O(VS), but only those exposed to English preferred to produce OR O(SV), the present study designed an instrument that controls for animacy, plausibility or context bias and investigates how HL and L2 learners at different proficiency levels comprehend subject and object relative clauses with both word orders. The goal is to find out whether these structures are vulnerable in the grammar of these learners like previous studies have shown for heritage speakers and L2 learners of Korean and heritage speakers of Russian (O'Grady, Lee, & Choo, 2001, 2003; Polinsky, 2011).

The other structures that are the focus of this study are adjectival and verbal passive clauses. Adjectival passive clauses describe a completed action, a state, and are constructed with the copula *estar* in the imperfect tense *(La cortina estaba colgada*, 'the curtain was$_{[\text{copula ESTAR}]}$ hung.'). The verbal passive clauses refer to an ongoing action and are constructed with the copula *ser* in the imperfect tense (e.g. *La cortina era colgada* 'the curtain was$_{[\text{copula SER}]}$ being hung'). To comprehend the adjectival and verbal passive clauses HL and L2 learners have to

[2] The oral production task used six items (object relative clauses), and these also included a prepositional phrase such that the target structure was (*Estos son los dibujos que pinta$_{[Verb]}$ el niño$_{[Subject\text{-}SING]}$ en el cuaderno* 'These are the drawings that the kid colors on the notebook'), but it is not clear whether the six items were all controlled for animacy, plausibility or context bias.

know the difference in meaning that each copula entails, as well as the meaning of the imperfect tense.

Furthermore, the canonical past tense for verbal passive clauses is the preterite *fue* (e.g. *La cortina fue colgada* 'the curtain was$_{[copula\ SER]}$ hung'). Bruhn de Garavito & Valenzuela (2008) found that L2 learners rate the acceptability of verbal passives with the copula in the imperfect tense (*era*) very low, ~2.2 in an acceptability rating scale ranging from 0 to 5. On the contrary, the acceptability rating for verbal passives with *fue* was 4. Valenzuela et al. (2015) replicated this study including HL learners and, like L2 learners, found that they do not accept verbal passives with *era* (~2.6 out of 5) but they do accept them with the canonical *fue*. Native speakers of Spanish show the same pattern of acceptability for the verbal passive clauses with the imperfect (~2.1 out of 5). These results indicate that HL, L2 and native speakers of Spanish disprefer verbal passives with the copula in the imperfect tense, but do not indicate whether they understand them or not. The present study investigates whether the lack of preference for verbal passive with *era* by L2 and HL learners is due to preference or due to lack of comprehension of these clauses given that aspectual distinctions typically show non-convergence in the grammar of L2 and HL learners.

Comprehension of relative and verbal passive clauses in this study requires knowledge of their grammar structure and their inflectional morphology. For the passive clauses in particular learners need to know that the verbal passive with *ser* in the imperfect tense, *era,* refers to an ongoing action, and that the adjectival passive with *estar* in the imperfect tense, *estaba*, describes a finished state. These clauses vary in how frequent they are in the input. SR-S(OV) and verbal passive clauses are infrequent in the input. The verbal passive clause in particular is typically used in the written modality only (Tolchinsky & Rosado, 2005). Moreover, English and Spanish

structures for the relative and passive clauses share the word order of the constituents in the clauses, except for the subject and object relatives with VO and SV inversion, SR-S(OV) and OR-O(VS), respectively.

Mastery of syntax and lexicon affects comprehension of these sentences and their ease or difficulty of acquisition, along with other seemingly important factors (i.e. frequency, processing load and L1 influence). Therefore, the focus on comprehension of complex syntax constitutes a good way to investigate the representation that these learners have acquired of these structures, and also the way these learners have organized and analyzed their grammar knowledge based on the frequency, complexity and pragmatic use of relatives and passive clauses.

This research contributes to answering these questions (a) how are age effects, input experience and proficiency related to difficulties associated with HL and L2 learner' grammar knowledge? (b) How do frequency of the structure and L1 influence affect comprehension of complex syntax?

The focus on structures of later language development at different proficiency levels, and on how different factors involved in the language experience shape the process of language acquisition are relevant not only for theory, but also for practical purposes. Understanding how type and amount of exposure to Spanish affect linguistic knowledge acquired will hopefully contribute to the implementation of successful pedagogical policies and practices in the United States that strive to preserve and foster education in the minority language. Understanding the knowledge these learners bring to the classroom will help figuring out what are the best classroom practices that facilitate acquisition of these structures, and understanding their knowledge of complex syntax would be especially helpful for speakers whose goal is to develop their language skills in all registers and in the four language skills.

This investigation is structured as follows. CHAPTER 2: defines L2 and HL acquisition. Its subsections discuss the linguistic skills of HL and L2 learners (2.1), their typical input/exposure experience (2.2), the differences between Explicit/Declarative and Implicit/Procedural Knowledge (2.3) and their performance in aural and written modality language tasks (2.4). Note that HL and L2 learners are also referred to as 'speakers'. Some types of L2 and HL research would not use these terms interchangeably. In the current study all HL speakers were currently or at some point HL learners. CHAPTER 3: explains in more detail the syntax of passive clauses and relative clauses. Section 3.1 explains the relative clauses. Section 3.2 explains the passive clauses and section. CHAPTER 4: states the research questions, hypotheses and predictions. CHAPTER 5: describes the method used to collect data and the tasks used. CHAPTER 6: presents the results. CHAPTER 7: presents the discussion and CHAPTER 8: the conclusion.

CHAPTER 2: L2 ACQUISITION AND HL ACQUISITION

Second language acquisition (SLA) refers to the acquisition of a language after the structural foundations of the L1 are in place. It can happen in naturalistic and in instructed environments, before or after puberty. The present study investigates adult L2 learners primarily learning the L2 in an instructed environment. More specifically, this study focuses on adults learning a language other than their native or primary language typically by choice, through formal instruction in a classroom with a textbook or a computer and an instructor. Learning a foreign language in this context provides L2 learners with explicit explanations about grammar rules, promotes metalinguistic knowledge, and gives them more opportunities to develop writing and reading skills in the L2. Nowadays L2 instruction provides L2 learners with the opportunity to engage with communities that speak the target language, and, using new technologies, the opportunity to speak and interact in the target language with people from countries where the target language is spoken. Nonetheless, opportunities to use the L2 orally in an instructed setting are generally limited to formal registers (oral presentation, oral exams, etc.). Ideally, acquisition of a second language would be a process during which second language learners acquire the L2 grammar and develop and adjust their new language system (i.e. interlanguage) until they master the basic language skills (listening, speaking, reading and writing) in different L2 registers. Realistically, the ability to communicate fluently in the L2 varies greatly and in fact L2 learners rarely reach near-native proficiency in the L2. Many factors are taken into consideration to explain this variable outcome, but the most notable one is age. Age of meaningful exposure to a second language is assumed to be a robust predictor of successful L2 acquisition, that is, the earlier a second language is acquired, the more native-like the ultimate attainment reached in it

will be (Bialystok & Kroll, 2018; DeKeyser, 2000; Hyltenstam & Abrahamsson, 2003; Johnson & Newport, 1989; Long, 1990; Mayberry & Kluender, 2018, among others).

Although this is also true for the acquisition of the native or primary language (L1), in L1 acquisition exposure to a language from an early age is crucial for successful language acquisition (Herschensohn, 2007; Montrul, 2008b). Children with normal hearing who are not exposed to language from an early age show dramatic effects in their L1, with linguistic development severely impaired as indicated by the few cases documented in the literature; cases such as Genie's, a girl deprived of L1 input from age one and a half to thirteen who could not surpass the linguistic development of a two-year-old after exposure to therapy and instruction (Curtiss, 1977; Herschensohn, 2007; Hyltenstam & Abrahamsson, 2003; Montrul, 2008b; Slabakova, 2008, among others). Also cited as evidence of effects of linguistic deprivation are cases of people who are born deaf or with hearing impairment showing that those who have acquired American Sign Language (ASL) at an early age (between 4 and 6 years old) have eventually better command of ASL than those whose meaningful exposure to ASL started after puberty (Mayberry & Kluender, 2018).

Hyltenstam and Abrahamsson (2003) restating Lenneberg's (1967) formulation of the Critical Period Hypothesis (CPH) explain that if a L1 is not acquired during early childhood—birth to four years of age (Herschensohn, 2007)—, the ability to acquire the L1 is severely affected and they explain that in L2 acquisition the CPH predicts that maturational constraints are responsible for the non-convergence seen in L2 learners. Indeed, results of the well-known (and intensely replicated) study by Johnson and Newport (1989) provide evidence for age effects in L2 acquisition. 46 Chinese and Korean speakers who had moved to the US at different ages completed a grammaticality judgment task with 140 ungrammatical and 136 grammatical

sentences testing 12 grammar rules. These authors found that age of onset of meaningful exposure to the U.S. (i.e. operationalized as age of arrival) was inversely correlated with native-like performance in the L2 (i.e. English) up until puberty (i.e. 16 years old). The earlier pre-pubescent L2 learners are exposed to the L2, the more successful they will be in the acquisition of the target language. These effects are not seen on learners exposed to the language after puberty. Johnson and Newport conclude that gradually declining language learning skills as we age show that there is a critical period for L2 acquisition that should be explained by a maturational account.

Bley-Vroman (1990, 2009) and Meisel (2011) propose that because of maturational constraints L2 acquisition and L1 acquisition are fundamentally different. Maturational constraints refer to age related limits that affect the innate human capacity for language, both at the level of knowledge and at the level of performance. There are maturational constraints in first language (L1) and second language (L2) acquisition. However, early age of exposure to a language is definitely crucial for successful L1 acquisition, and not necessarily for successful L2 acquisition. The general agreement is that there is a critical period for L1 acquisition. But whether or not there is a critical period for L2 acquisition is still a controversial topic. Some researchers have found that L2 learners' non-convergent grammar varies according to the age of meaningful exposure to the L2 and that L2 and L1 acquisition involve different mechanisms, and conclude that these findings support a critical or sensitive period (e.g. DeKeyser, 2000; Hyltenstam & Abrahamsson, 2003; Long, 1990; among others), while others see that the data so far support age effects but not a critical period (e.g. Bialystok & Kroll, 2018; Mayberry & Kluender, 2018). Still, maturational constraints are used to explain non-convergent grammar or

degree of ultimate attainment in L2 acquisition, L2 and L1 differences in language processing, and differences in linguistic knowledge.

Maturational constraints play an important role in the successful acquisition of a language, but it is certainly not the only factor at play. This fact is attested in early bilingual or heritage language acquisition. HL speakers are children of immigrants or immigrant children who arrive at a country where the majority language is different from their first language (Montrul, 2008b; Rothman, 2009; Silva-Corvalán, 1994; Valdés, 2005). They are exposed from birth to their first language (i.e. heritage language, minority language) in a naturalistic environment (family, heritage language speaking community) with mostly aural input that fosters implicit knowledge of the language and development of oral skills. They typically have opportunities to engage in meaningful but informal conversations with different types of speakers (e.g. grandparents, siblings, cousins, parents, community etc.) but have limited or no opportunities to use the language in formal settings or the use of the language in formal writing. HL acquisition in this informal context rarely involves the learning of grammar rules and metalinguistic knowledge. Because their linguistic experience is so varied heritage speakers' proficiency (excluding those who were raised in the culture of the heritage language, but rarely ever heard the language or used it at home) ranges from fully fluent to minimal comprehension abilities (i.e. receptive bilinguals).

Exposure to the HL happens before or at the same time that HL speakers learn the dominant language of their new country of residence (i.e. the majority language). As these children assimilate to the mainstream culture through preschool, daycare or school, the exposure to the minority language wanes and the majority language becomes their dominant language. Research has shown that the earlier a child starts acquiring a majority language as a second

language, the greater the impact on the heritage language (Bylund, 2009; Montrul, 2008b). The impact of learning two languages simultaneously at such an early age, and the reduced input of the L1 is reflected in weaker command of the heritage language and typically results in incomplete acquisition (Montrul, 2008b)—a.k.a. 'differential acquisition' (Kupisch & Rothman, 2016)—, language attrition or language loss (Montrul, 2008b; Silva-Corvalán, 1991), or both. Incomplete or differential acquisition refers to a linguistic system that does not show certain properties expected and seen in the linguistic system of fully fluent bilinguals and monolingually raised speakers of a certain language meaning that the grammar developed by heritage speakers diverges from that of monolingually raised speakers and fully fluent bilinguals. Language attrition refers to having acquired and later lost parts of its grammar. Although language loss can be caused by pathological issues, in the case of bilingualism it is related to the predominance of the majority language in the child's social context and the reduced opportunities to hear and produce the heritage language.

Thus, to summarize research has shown that age is an important factor in language acquisition, but age alone cannot explain L2 and HL learners' non-convergent grammars. The process of acquiring a language involves, among other factors, social and psychological factors, such as affect and motivation; input related factors such as quantity and quality of input; input modality and factors related to language learners such as prior linguistic knowledge, proficiency and use of each language, exposure to more than one language, and the complexity of linguistic phenomenon in these languages (Birdsong, 2018; Montrul, 2016; Paradis & Grüter, 2014; Silva-Corvalán, 2014). The following sections describe aspects of HL and L2 grammar and language experience relevant for the current study. Section 2.1 presents a brief description of linguistic skills of L2 and HL speakers. Section 2.2 compares input and exposure typically experienced by

L2 and HL learners. Section 2.3 summarizes the terms explicit/declarative and implicit/procedural knowledge, and Section 2.4 discusses performance of L2 and HL learners according to task modality.

2.1 Linguistic skills of L2 and HL speakers

Heritage speakers' linguistics skills in the heritage language are highly variable. They are best described in a continuum ranging typically from ability to comprehend the HL but not produce it (i.e. receptive abilities) to being able to produce it and comprehend it (i.e. productive and receptive abilities) with persistent vulnerabilities in morphology and syntax (Montrul, 2018). L2 learners' linguistics skills are also highly variable and can reach native-like proficiency. Within the variability, however, each group shows its own linguistic traits and tendencies.

Regarding phonology, research has shown that heritage speakers pattern with monolingual native speakers in some aspects (i.e. perception) (Boomershine & Kim, 2018), and in other aspects (e.g. pronunciation of certain sounds) they pattern with L2 learners (Ronquest & Rao, 2018). Generally, however, their speech unequivocally sounds native-like, which supports the general observation that phonology is an aspect of language acquisition clearly affected by maturational constraints (T. K. Au et al., 2002; Montrul, 2016).

Regarding morphosyntax, syntax and semantics, heritage speakers and L2 learners' language skills are (dis)similar in different ways and vary depending on proficiency attained, grammar structure investigated and task modality used (Montrul, 2016).

Findings showing similarities indicate that low proficiency L2 and HL speakers have similar command of object clitics in simple sentences (Montrul, 2010b), and are inaccurate with the subjunctive-indicative distinction (Montrul & Perpiñán, 2011). Both groups at not only low, but also intermediate and advanced proficiency levels, show knowledge of constraints of *wh*-

movement (Montrul, Foote, & Perpiñán, 2008b). Based on studies of gender agreement (Montrul et al., 2008a), differential object marking (DOM) (Montrul, 2010a), and tense-aspect distinction and mood, Montrul (2011a) concludes that L2 learners and HL speakers with intermediate proficiency were similarly accurate but their accuracy rate depended on the modality of the task.

L2 learners and HL of intermediate to advanced proficiency have similar knowledge of how the syntax of unaccusativity works in Spanish (Montrul, 2005). At advanced proficiency levels HL and L2 learners are similarly accurate interpreting preterite and imperfect morphology (Montrul & Perpiñán, 2011) and, at intermediate and advanced proficiency, integrating knowledge of subject-verb number agreement (Foote, 2011). In addition, studies for advanced HL and L2 learners of Spanish, have found that both groups have acquired Spanish gender (Alarcón, 2011; Foote, 2011), even if they continue to struggle with gender agreement of non-canonical feminine nouns, those that do not end in the typical *-a,* (i.e. una serpient**e** roj**a**) as shown by Montrul, de la Fuente, Davidson, & Foote (2013). Regarding semantics of definite plural articles in generic contexts, Montrul & Ionin (2012) found that intermediate to advanced HL and L2 learners show effects of transfer from English in the interpretation of these articles. Investigating effects of English to Spanish transfer in knowledge of Spanish clitics and DOM, Montrul (2010a) found effects of transfer, albeit differently, in the grammar of these two groups of learners.

Focusing on the differences between HL and L2 learners' linguistics skills, research shows that skills of low proficiency heritage speakers are more native-like than their L2 learners' counterparts with implicit knowledge regarding syntax and semantics of unaccusativity (Montrul, 2005), use and processing of complex structures with clitics (Montrul, 2010b), and implicit knowledge of gender (Montrul, Davidson, De La Fuente, & Foote, 2014). Montrul and Perpiñán

(2011) found that at low and intermediate proficiency levels HL learners were more accurate than L2 learners with the preterite and imperfect distinction; and at advanced proficiency levels L2 learners were more accurate than HL learners with the subjunctive-indicative distinction.

Keating, Vanpatten, & Jegerski (2011) studied the intra sentential anaphora in Spanish. They examined antecedent biases in globally ambiguous complex sentences (e.g. "John saw Charles when *pro*/he was walking on the beach."), in monolingual speakers who had been living in the U.S. an average of 2.26 years, self-reported advanced heritage speakers and L2 learners, by asking assignment preferences about the antecedent of null and overt pronouns. They found that while L2 and HL learners strategies differed from that of monolingual speakers, HL learners were monolingual-like in their antecedent bias for the null pronoun.

A study of focus in Spanish showed that heritage speakers with advanced proficiency pattern with other monolinguals (i.e. adults who were raised in a Spanish-speaking country and later moved to the U.S.—after puberty— and those who still reside in a Spanish-speaking country) in the production of subject focus (Leal Méndez, Destruel, & Hoot, 2017). Studies focusing on DOM (Montrul, 2011b)) have shown that intermediate to advanced heritage speakers and L2 learners have difficulties in the acquisition of its semantic constraints (Bowles & Montrul, 2009; Guijarro-Fuentes & Marinis, 2007; Montrul, 2011b; Montrul & Bowles, 2009; Montrul & Sánchez-Walker, 2013).

In addition, research has shown that simultaneous bilingual heritage speakers' grammar shows acceptance of p-stranding (i.e. a construction that features stranding of the preposition and fronting of the object of the preposition), a core syntactic property that is not present in the Spanish grammar of sequential bilingual heritage speakers and monolingually raised bilinguals (Pascual y Cabo & Gómez Soler, 2015). Similarly, data from Cuza and Frank (2011) found that

knowledge of embedded interrogatives in Spanish is vulnerable in the grammar of heritage speakers from low to advanced proficiencies.

In sum, in phonology heritage speakers can pattern with monolingual Spanish speakers ––but see Ronquest & Rao (2018). Morphology, syntax and pragmatics, nonetheless, remain vulnerable areas even at high proficiency levels, as indicated by persistent problems with inflectional morphology (i.e. case, aspect, mood), complex syntax and discourse pragmatics (i.e. p-stranding, determiners, overt subjects) (Montrul, 2018; Montrul & Polinsky, 2011).

2.2 Input and exposure to a second language (L2) and a heritage language (HL)

Non-convergent grammars and skills developed in the L2 and HL are generally correlated with quantity and quality of exposure to the L2 or HL. Although what type and what amount of L2/HL exposure is needed for the development of specific linguistic components has not been specifically delimited, it is a fact that to learn a language a person has to be exposed to the language enough to form a mental representation of it and develop implicit knowledge of it. Just as important is how this input is processed and integrated, the person's experience with the language, and how this experience guides L2/HL acquisition.

For HL learners, input in the heritage language from a language varies greatly in childhood. Attitudes toward the HL change over time as the bilingual child grows up, social context changes as well (i.e. interlocutors, opportunities to engage in meaningful conversation, friends, babysitter, divorce, moving, etc.), and, most importantly, the educational context changes too (i.e. dual language school, full immersion school). Type of exposure and use of the HL affect bilingual first language development and are main factors determining mastery and proficiency in the HL (Silva-Corvalán, 2014, p.350; Sorace, 2011, p. 21 and references therein).

As Montrul (2016) explains, before reaching school-age, children's input comes mainly from the family and the community if they live in a heritage language-speaking community. Once they reach school-age, heritage speakers' linguistic context changes to include, in the U.S., English spoken by teachers, school staff and their classmates. More importantly is the fact that if they attend an English immersion school, they start their literacy process in English. As these children begin to socialize at school, they do so in English mostly, unless they attend a dual immersion school or a Spanish immersion school, but this is rare for the typical heritage speaker. Consequently, the use of the heritage language is reduced to domestic and familiar contexts and limited to a few hours per day. Another factor to consider is that HL speakers' input might be qualitatively different from the input of monolingually raised children in a Spanish-speaking environment. The native language in monolingual speakers can undergo attrition of certain areas of grammar, which implies that the quality of HL input could also be responsible for heritage speakers' lack of mastery of certain linguistic phenomena (Montrul & Sánchez-Walker, 2013).

Silva-Corvalán's (2014) study provides evidence of how fluctuations in heritage language input and use affect children's proficiency and development of the language. Silva-Corvalán describes and analyzed the acquisition and development of English and Spanish by two of her grandchildren, Nico (older sibling) and Brennan (younger sibling). Both children were born and raised in Los Angeles, CA. The data analyzed range from children's age 1;3 to 5;11. Nico's proficiency in Spanish is higher than that of Brennan's, which Silva-Corvalán attributes to being the older sibling and being exposed to more Spanish than his younger brother. Indeed, her findings reveal that Nico has developed better command than his brother of the structures studied (i.e. tense, aspect and mood verb morphology, p. 344). In addition, the author showed that complexity and frequency of grammar constructions in the HL input affect its acquisition or lack

thereof, language development and crosslinguistic influence. For instance, Silva-Corvalán states that the frequency of the present perfect in Peninsular Spanish explains why it is acquired earlier than in Latin American Spanish (p.353). She adds that complexity of a linguistic phenomenon may aid or thwart frequency effects, especially if the dominant language has a similar phenomenon that either facilitates or hinders acquisition (p.354).

Adult L2 learners' input from a classroom setting is also variable but different from natural informal settings. In the classroom context, social factors such as, among others, learners' motivation to learn the L2, their aptitude, their personality, their attitude and their individual differences affect learner-instructor interactions. Likewise, instructors and institutions have different curricula that can make L2 acquisition a drastically different experience for L2 learners. Instructional context is variable, namely, study abroad, virtual classroom, autonomous learners and classic language classroom at school or colleges (Loewen & Sato, 2017). Instructors and learning contexts are important factors that affect quality and amount of input: instructors-led discussions vs. computer-led discussion, student-centered vs. teacher centered classrooms, instructor's proficiency in the language (instructors can be native speakers or L2 learners themselves), teaching style (use of repetitions, use of different audio-visual methods, or their use of comprehensible input, their ability to illustrate form-meaning connections and to get new forms noticed by learners, among many others). Instructional approaches include, among others, focus on form, comprehensible input, task-based, conversational interaction, content-based, developmental stages, and a combination thereof (DeKeyser & Prieto Botana, 2014; R. Ellis, 2008; Lightbown & Spada, 2006).

Another characteristic of L2 input is that the language is presented in a step by step fashion. L2 learners are not presented with a variety of structures at once. They receive modified input by

instructors who adapt their language level to one the students can understand (i.e. teacher talk) (Lightbown & Spada, 2006). In addition, learners' exposure to the L2 is limited to a few hours a week, and this exposure does not equal meaningful interactions even in a communicative language classroom. Related to limited input is the fact that many grammar structures need to be introduced and practiced explicitly to be integrated in the mental grammar. Limited exposure to the language provides scant opportunities for that to take place. All these factors also apply to HL learners' classroom experience when they decide to learn more about their HL through formal instruction.

2.3 Explicit/Declarative and Implicit/Procedural Knowledge[3]

A distinctive characteristic regarding the input/exposure that L2 and HL learners receive is the type of knowledge that these learners develop based on their experience (N. C. Ellis, 2008). L2 instruction begins with the conscious learning of grammar. L2 learners thus develop what is referred to as explicit or declarative knowledge of grammar because the learners are aware of what they are learning (R. Ellis, 2008). They have metalinguistic knowledge or awareness of the language and can retrieve this knowledge and explain, for instance, a rule (i.e. They know that the 3rd person plural of the preterite of the verb *leer* 'to read' is *leyeron* 'they read', and they can also explain that you conjugate a verb using inflectional morphology *-eron* when the subject refers to more than one person and the action occurred in the past) (N. C. Ellis, 2008; Loewen, 2014). Explicit knowledge can be formulated as a lesson. Students who memorize the lesson will likely perform well on a test that taps explicitly taught information. However, retrieving explicit

[3]Explicit and implicit knowledge are terms used from a cognitive perspective, and declarative and procedural knowledge are terms used in Skill Acquisition Theory (Loewen, 2014). For the purposes of this thesis they are interchangeably but see DeKeyser (2015).

knowledge of a language spontaneously, in real time, is cognitively costly and impairs communicative competence (Loewen, 2014; Loewen & Sato, 2017).

Although most L2 learners begin their acquisition of the L2 with explicit knowledge of a linguistic phenomenon, they can also develop unconscious or implicit knowledge (R. Ellis, 2005, 2008). Implicit knowledge of a language refers to having unconscious and automatic knowledge of the language (R. Ellis, 2005, 2008, 2009; Loewen, 2014; Rebuschat, 2013); for instance, situations when a speaker produces a sentence such as *leyeron el libro* 'they read[3rd.PLU.PRET.] the book' without consciously thinking about the plural morphology of the preterite of the verb *leer*. That is, this language knowledge becomes automatized (DeKeyser, 2017), which is one of the goals of L2 acquisition (R. Ellis, 2008; Nassaji, 2017). Still, when they rely on metalinguistic knowledge, performance in real time is a difficult process for L2 learners (R. Ellis, 2005).

In contrast, the language knowledge that HL speakers develop after exposure to their HL from birth is that of native speakers, namely, implicit knowledge or procedural knowledge of the language. That is, knowledge that they are not conscious about because they acquired it while using it (N. C. Ellis, 2008). Most native speakers speak the language focusing on the meaning they want to communicate rather than on the grammar constructions. These speakers depend on their intuition to judge grammatical construction and they typically base their judgment on whether the constructions sound right or not (R. Ellis, 2005; Loewen, 2014; Rebuschat, 2013). Implicit knowledge is accessed quickly without conscious awareness, and thus allows for greater communicative competence (Loewen & Sato, 2017). In addition, like most native speakers who have not received (or never paid attention to) language instruction, HL speakers typically lack metalinguistic knowledge. Nevertheless, because implicit knowledge is the foundation for many essential language skills (i.e. language comprehension and production, among others) HL

speakers tend to show best their language knowledge when completing tasks that tap implicit knowledge (Bowles, 2011a; Montrul et al., 2008a; Montrul & Perpiñán, 2011).

Contrary to speakers who grow up in a monolingual environment, and even though they have implicit knowledge of many aspects of the HL, HL speakers do not master all areas of grammar of the HL. Hence, they enroll in Spanish courses to learn more about the language. In the classroom they are presented with metalinguistic information about the HL. Although research on HL instruction is still minimal, it has been shown that as adults, formal instruction helps HL learners in the acquisition of grammatical constructions (Bowles & Montrul, 2008; Montrul & Bowles, 2010; Potowski, Jegerski, & Morgan-Short, 2009). As Montrul (2016) explains, research continues to investigate whether and how the metalinguistic knowledge acquired by HL learners is integrated and automatized in their HL grammar, becoming implicit knowledge.[4]

2.4 Task Modality

Besides fostering implicit or explicit knowledge, L2 and HL speaker's linguistic experience influences their abilities with language tasks basically because each experience emphasizes different language skills. L2 learners' meaningful exposure to the L2 focuses mainly on instruction of grammar rules and how these rules are used, with a textbook in the classroom where opportunities for verbal and meaning-focused interactions are not common. Learning the grammar in classroom settings helps them develop metalinguistic knowledge of the language because many language classrooms use instruction and assessment methods geared at evaluating

[4] Scholars in the field of instructed second language acquisition (ISLA) disagree on whether explicit knowledge acquired can become implicit knowledge or 'interface positions'—i.e. (i) explicit knowledge cannot become implicit, (ii) depending on the circumstances explicit knowledge can become implicit and (iii) explicit knowledge can become implicit (Loewen & Sato, 2017).

metalinguistic knowledge (Montrul, 2016). Consequently, having extensive practice with tasks that assess metalinguistic knowledge, L2 learners tend to perform well in tasks that target metalinguistic knowledge (Bowles, 2011a; Montrul et al., 2008a). Heritage speakers also have limited meaningful exposure to the language, but their exposure is mostly aural in informal settings with family, relatives and their Spanish speaking community. They do not have significant experience writing or reading the heritage language, so typically they are not very literate in the heritage language and, therefore, they have more implicit knowledge of the HL (Montrul, 2008b, 2016). Because their experience with the language is mostly aural, they tend to perform better in oral and auditory tasks that tap on implicit knowledge (Bowles, 2011a, 2011b; Montrul et al., 2008a).

Indeed, research has shown that language experience affects the linguistic performance of HL speakers and L2 learners in different tasks. Bowles (2011a) shows how these speakers' linguistic experience affects their performance in the classroom. The author studied how HL and L2 speakers working in pairs interacted during completion of one oral task and two written tasks. Analysis of language related episodes showed that the L2 learners' knowledge of orthography and HL learners' knowledge of grammar and vocabulary consistently contributed to completion of the tasks. Bowles explains that HL learners relied on their linguistic intuition to provide vocabulary and grammar information and that L2 learners relied on their metalinguistic knowledge of orthography, likely due to their language experience in the classroom context. Similarly, research by Torres (2018), in which he manipulated task complexity to study how different types of instruction affected development of Spanish subjunctive in L2 and HL learners, showed that their performance reflected their HL/L2 language experience. While both groups showed retained knowledge of the subjunctive in the oral production tasks, the L2 learners

showed more gains in the written production task. More importantly, this study revealed the way the two groups approached these tasks: HL learners focused on the meaning they wanted to communicate rather than on the form, whereas L2 learners focused more on the form and tried to form rules. Results from Torres (2018) resembled that of Potowski et al. (2009), which focused on the development of the Spanish past subjunctive after exposure to processing instruction and traditional instruction. Potowski et al.'s results showed that in interpretation and production tests HL showed improvement, but not in the grammaticality judgment task. L2 learners showed greater improvement than the HL learners in all tasks. The authors explain that a possible explanation for these results is that L2 learners' classroom experience helped them make the most of the instruction received (p.563). In addition, Montrul and Bowles (2010) found that although explicit instruction of DOM (a-personal) with gustar-type verbs was beneficial for HL, results from written production and acceptability tests showed improvement in the production tests only, not in the acceptability tests. Therefore, besides their classroom performance, linguistic experience affects results in assessment of these speakers' knowledge of the language depending on the modality of the instrument (Bowles, 2011b). This fact is of concern in L2 and HL acquisition as researchers try to identify vulnerable areas in different linguistic domains of the L2/HL.

Findings in different studies have shown that indeed modality affects performance in the HL and the L2. Montrul (2011a) presents data for gender agreement (Montrul et al., 2008a), differential object marking (DOM) (Montrul, 2010a), and tense-aspect and mood (TAM) morphology of HL speakers and L2 learners of intermediate proficiency in written and oral modality. Gender agreement was evaluated with a written picture identification task in which participants had to match a determiner with a bare noun according to gender and number, a

written elicited recognition task that asked to identify the correct determiner or adjective according to gender and number, and an oral picture description task in which learners had to describe a picture using the correct determiner, noun and adjective. Results showed a relationship between mode of acquisition and task modality. L2 learners performed better than the HL speakers in the written tasks, and heritage speakers performed better in the oral production task. DOM was evaluated with an oral narrative and an untimed acceptability judgment task, and HL speakers were less accurate than the L2 learners in the written tasks, but were more accurate than the L2 learners in the oral task. Tense-aspect morphology was evaluated with an oral narrative and a written morphology recognition task, subjunctive morphology was evaluated with an oral production task that elicited the use of the subjunctive and a written recognition task. All results showed the same trend: the HL speakers were more accurate in the oral tasks than in the written tasks and L2 learners were more accurate in the written tasks than in the oral tasks. The best explanation for this task effect, as the author indicates, is L2 learners and HL speakers "language learning experience and practice" (p.187).

Montrul, de la Fuente, Davidson, & Foote (2013) studied further this contrast in performance according to task modality by using an elicited oral production task to investigate the effects of language experience and knowledge of diminutives and gender agreement. The task elicited a noun phrase containing a determiner, a noun and a color that had to agree on gender, and one of the experimental conditions required the diminutive of the noun. Results showed that the HL speakers were more accurate than the L2 learners. This means that HL speakers showed more accuracy with aspects of early input, including diminutives which are part of child-directed speech. Montrul et al. (2014) presents more data from this group of speakers regarding processing of gender of canonical and non-canonical nouns, and manipulating implicit

versus explicit tasks. Results show that HL speakers perform better in aural tasks that maximize use of implicit knowledge.

To summarize, age of acquisition and language experience affect HL and L2 acquisition and development. Early exposure to the HL helps HL speakers sound native, whereas L2 learners do not have this advantage. Regarding morphosyntax, syntax and semantics, heritage speakers and L2 learners' language skills are (dis)similar in different ways and vary depending on proficiency attained, grammar structure investigated and task modality used (Montrul, 2016). L2 instruction begins with the conscious learning of grammar. L2 learners develop metalinguistic knowledge or awareness of the language and can retrieve this knowledge and explain it because this type of knowledge can be formulated as a lesson. They tend to perform well on tests that tap on explicit knowledge. However, retrieving explicit knowledge of a language spontaneously requires effort and impairs communicative competence (Loewen, 2014; Loewen & Sato, 2017). HL speakers develop implicit knowledge or procedural knowledge of the language. That is, knowledge that they are not conscious about because they acquired it while using it (N. C. Ellis, 2008). They tend to focus on the meaning they want to communicate rather than on the grammar constructions. These speakers depend on their intuition to judge grammatical construction and they typically base their judgment on whether the constructions sound right or not (R. Ellis, 2005; Loewen, 2014; Rebuschat, 2013). Implicit knowledge is accessed quickly without conscious awareness; therefore, it allows greater communicative competence (Loewen & Sato, 2017). HL speakers typically lack metalinguistic knowledge unless they enroll in formal instruction. Implicit knowledge is the foundation for language comprehension and production, which explains why HL speakers tend to show best their language knowledge when completing tasks that tap on implicit knowledge (Bowles, 2011a; Montrul et al., 2008a; Montrul & Perpiñán,

2011). The type of knowledge developed (implicit/explicit knowledge) and the modality of the instrument used to test it affect the actual language knowledge retrieved from these two groups of learners (Bowles, 2011b). Heritage speakers' strongest skills are speaking and listening, hence their performance in aural tasks or tasks that tap on implicit knowledge are generally better than in written tasks or tasks that tap on metalinguistic knowledge. In contrast, L2 learners begin learning the L2 during adolescence or later and acquire it primarily through literacy in a classroom context, where development of oral skills is less emphasized. They perform better in written tasks or tasks that emphasize metalinguistic knowledge. (Montrul et al., 2008a; Montrul & Perpiñán, 2011). It is important to note, however, that when these learners reach high proficiency levels they tend to perform native-like or close to native-like in untimed written tasks, which also tap on metalinguistic knowledge (Montrul, 2014). The studies that comprise this dissertation seek to find out how HL and L2 speakers' experience, acquired knowledge, and language skills impact their comprehension of complex syntax in Spanish.

CHAPTER 3: COMPLEX SYNTAX

The term 'complex syntax' is typically equated to complex embedded sentences like the relative clauses (i.e. sentences with a main clause and dependent clauses). In this study we use the term to refer not only to embedded clauses, but also to sentences in which the canonical order of sentence constituents has been altered by movement of constituents like in passive clauses. Although acquired early (by age 3), development of relative and passive clauses continues until they are fully mastered at a later age during the school age period. According to Berman (2004, p.9) developing proficiency in a language requires linguistic command of grammar and lexical aspects, being able to integrate the forms in the grammar, and being able to use the language as required by the discursive context. Furthermore, comprehension of relative and passive clauses requires considerable knowledge of syntactic rules and specific morphosyntactic properties of Spanish, such as gender agreement, differential object marking and word order. The fact that these clauses are developed during the school-age period presents a challenge for typical Spanish HL learners in the U.S., whose input to Spanish is greatly reduced when they start elementary school. It is crucial to investigate to what extent these structures are acquired by L2 learners and heritage speakers, especially if literacy exposure varies between the two groups.

3.1 Relative Clauses

Relative clauses are embedded clauses that modify noun phrases of the main clause. This thesis focuses on embedded clauses that modify noun phrases of the main clause in the subject or in the object position. Syntactically, relative clauses establish a referential dependency between a trace left by movement and the head of the relative clause (Guasti, 2002). Example (1) is as a subject relative clause because the head of the relative clause is the subject of the verb in the

relative clause. Example (2) is an object relative clause because the head of the relative clause is the object of the verb in the relative clause.

(1) The man that likes the woman arrived. (SS)[5]

(2) The man that the woman likes arrived. (OS)

Subject and object relative clauses (SRC and ORC, respectively) are restrictive relative clauses, also known as adjective clauses. They are introduced by the complementizer 'that' or *que* in Spanish. Restrictive relative clauses describe, identify, or give further information about a noun, limiting its meaning. The noun phrase (NP) that is modified, also known as the antecedent or head is provided in the matrix clause, in this case 'the man'.

Relative clauses in Spanish involve a type of *wh*-movement in which a special null *wh*-word referred to as an operator (Op) in the deep structure moves to the Spec of the CP just like a *wh*-word would. When it moves, it leaves a trace or a gap within the clause. See examples (3) and (4).

(3) $[_{DP}$ The man$_i$ $[_{CP}$ Op$_i$ that $[_{IP}$ ___ likes the woman]]] arrived. (SS)

(4) $[_{DP}$ The man$_i$ $[_{CP}$ Op$_i$ that $[_{IP}$ the woman likes ___]]] arrived. (OS)

3.1.1 Word order in relative clauses

One important difference between Spanish and English relative clauses concerns the verb and object (VO) order in the SRC, and the subject and verb (SV) order in the ORC. In English,

[5] The abbreviations (SS) and (OS) mean that subject of the relative clause is also the subject of the matrix clause, and that the object of the relative clause is the subject of the matrix clause, respectively. Example taken from O'Grady et al. 2003.

the embedded SRC has (VO) order, and the embedded ORC has (SV) order, see (5) and (6). (VO) order in the SRC and (SV) order in the ORC will be called "English-matching" word order, for convenience.[6]

(5) This is the man [$_{CP}$ that <u>likes</u> **Verb** <u>the woman</u> **Object**]. (SS)

(6) This is the man [$_{CP}$ (that) <u>the woman</u> **Subject** <u>likes</u> **Verb**]. (OS)

The CP in Spanish relative clauses can have English-matching word order or object-verb inversion in the SRC, see (7) and (8), and subject-verb inversion in the ORC, see (9) and (10). Another notable difference is that in English the object relative clause does not have to have the complementizer *that*, while the complementizer *que* is always obligatory in Spanish.

(7) El submarino [$_{CP}$ que <u>hundió</u> **Verb** <u>los barcos</u> **Object**]. English-matching SRC

The submarine$_{Subject\text{-}sg}$ [$_{CP}$ that <u>sank</u>$_{Verb\text{-}sg}$ <u>the boats</u>$_{Object\text{-}pl}$].

(8) El submarino [$_{CP}$ que <u>los barcos</u> **Object** <u>hundió</u> **Verb**]. Non English-matching SRC

*The submarine$_{Subject\text{-}sg}$ [$_{CP}$ that <u>the boats</u>$_{Object\text{-}pl}$ <u>sank</u>$_{Verb\text{-}sg}$].

(9) El submarino [$_{CP}$ que <u>los barcos</u>$_{Subject}$ <u>hundieron</u>$_{Verb}$] English-matching ORC

The submarine$_{Object\text{-}sg}$ [$_{CP}$ that <u>the boats</u>$_{Suject\text{-}pl}$ <u>sank</u>$_{Verb\text{-}pl}$]

(10) El submarino [$_{CP}$ que <u>hundieron</u>$_{Verb}$ <u>los barcos</u>$_{Subject}$] Non English-matching ORC

*[The submarine]$_{Object\text{-}sg}$ [$_{CP}$ that <u>sank</u>$_{Verb\text{-}pl}$ <u>the boats</u>$_{Subject\text{-}pl}$]

[6] ORC can also occur without the subject. *Este es el submarino que hundieron*. But for comparison in this study we need to have both ORC with the explicit subject.

Although according to Gutierrez-Bravo (2003, p.155) the unmarked word order in the relative clause is the post-verbal position (VS), both object relative clauses, with SV order and with VS order, co-occur in Spanish and it is not clear whether one is more acceptable than the other except in very specific contexts (i.e. focalization) (Francom, 2012; Gutiérrez-Bravo, 2003; Liceras, 1994; Torrego, 1984; Zagona, 2002). Unlike other constructions with *wh*-movement that require subject-verb inversion, Spanish relative clauses do not. In this respect Liceras (1994) proposes that SV inversion cases have to be based on syntactic, semantic or pragmatic factors, whereas Gutiérrez-Bravo (2003) based on the Optimality Theory, proposes that due to intonational considerations (alluding to the prosodic weight of the intonational constituents) the VS order is the unmarked word order in ORC unless the subject of the ORC is a sentence topic, in which case the SV order would be attested.

The important fact for this study is that English-matching ORC and non English-matching ORCs are both attested and acceptable in Spanish. On the contrary, only English-matching SRC, with VO order, are more acceptable and frequent in Spanish. The non English-matching SRC (with OV order) is very infrequent in spoken and in written language and it is limited basically to creative texts which is congruent with the rarity of Spanish constructions ending with a verb (i.e. *A buen entendedor, pocas palabras*$_{Subject}$ *bastan*$_{Verb}$ 'A word to the wise is enough.'—sentences ending with a verb are typically unacceptable except for those that end in a verb either for emphasis or for verse rhythm in poetry or rhythmical sayings such as the example above—).

3.1.2 Acquisition of relative clauses

In language acquisition, relative clauses emerge early but are mastered late and are related to literacy development (Brown, 1972; Correa, 1982, 1995; Friedman et al., 2009; de

Villiers et al., 1994; McKee et al., 1998; Roth, 1984; Sheldon, 1974; Tavakolian, 1981). Acquisition of relative clauses has been widely studied in L1 (Diessel & Tomasello, 2000; O'Grady, 1997, and references therein), L2 (Kanno, 2007; Kidd, 2011; Matsumoto, 2007, and references therein) and heritage language acquisition—i.e. Korean (O'Grady et al., 2001) and Russian (Polinsky, 2011)—especially with respect to their frequency and accessibility for processing.

Many of these studies on the acquisition of relative clauses have tested Keenan and Comrie's (1977) typological characterization and predictions formulated in their noun phrase Accessibility Hierarchy (AH), see Table 1. According to Keenan and Comrie the AH predicts facility of relativization depending on the grammatical function of the subject (or head) of the matrix clause restricted by the relative clause. Subject relative clauses are the most frequent and easiest to be acquired, followed by direct object relative clauses, then indirect object or prepositional (oblique) relative clauses, then genitive relative clause and, lastly, the object of comparative relative clause. The low positions at the table indicate that these structures are infrequent in the languages surveyed. The hierarchy indicates that subject relative clauses are more frequent and easier to relativize. As a result, these clauses are considered typologically less marked than object relative clauses.

The AH is implicational and predicts the types of relatives that a language has. All languages have subject relative clauses, for example. But if a language has indirect object relatives (IO) it will also have, direct object (DO) and subject (SU) relatives.

Table 1 Accessibility Hierarchy

SU > DO > IO > OPREP > GEN > OCOMP		
SU	**Subject**	**The dog that bit the man**
DO	**Direct Object**	**The man that the dog bit**
IO	Indirect Object	The girl that I wrote a letter to
OPREP	Object of Preposition	The house that I talked to you about
GEN	Genitive	The family whose house I like
OCOMP	Object of comparative	The woman that I am taller than

'>' = 'more accessible than'; (Examples taken from Gass, 1979)

Gass (1979) claims that the AH can also predict ease of relativization in L2 acquisition. In fact, many L2 studies have shown that SRC are easier to produce and comprehend than ORC, as predicted by the hierarchy (Kanno, 2007; O'Grady et al., 2003; Polinsky, 2011, and references therein). However, Kanno (2007) and Matsumoto (2007) argue that these predictions were based on data gathered on European languages with SVO (i.e. English, French, Italian and Swedish). In fact, the two authors and others—see Kidd (2011)—explain that exceptions have been found based on language typology (i.e. Matsumoto explains that data on whether the AH predict L2 acquisition of Japanese, Korean and Chinese relative clause is inconclusive), and Kidd also explains that semantics, animacy of noun phrases, discourse and other important factors affect L1 and L2 acquisition of relative clauses.

In addition to studies on acquisition, research on L1 and L2 processing of relative clauses has been substantial especially regarding relative clause attachment preferences (Kroll & Dussias, 2012). Kroll and Dussias (2012) suggest that when the L1 and the L2 have similar syntactic rules

L2 processing becomes more native-like. Furthermore, studies have shown that processing of ORCs and SRCs is affected by factors such animacy of the NPs (Betancort, Carreiras, & Sturt, 2009; Mak, Vonk, & Schriefers, 2002, 2006); plausibility and frequency of a particular NP and verb combination (Garnsey, Pearlmutter, Myers, & Lotocky, 1997; Traxler, Morris, & Seely, 2002); reversibility of the action of the verb (that is, if either NP could perform the action expressed by the verb) (Polinsky, 2011); verbal agreement or other features that resolve the ambiguity of a sentence (Hopp, 2006; Polinsky, 2011). In the case of L2 acquisition, processing is also affected by L2 proficiency (Hopp, 2006, 2010).

O'Grady et al. (2003) claimed that L2 acquisition of SRC and ORC was sensitive to typological markedness due to processing considerations, and indicates that one explanation given to account for the processing difference between subject and object relatives is the difficulty posed by the linear distance between the head and the gap. The linear distance between the head and the gap can affect correct parsing of these structures. Indeed, Hawkins (1989) studied written elicited production of French relative pronouns by 119 English native speakers who had completed varying degrees of instruction in French and results showed that, although there were animacy effects, there was a difference in difficulty between SRCs and ORCs which he relates to the linear distance (in number of words) between the head and the gap of the relative clause. See distance in examples (11) and (12).

(11) Subject Relative

$[_{DP}$ The man$_i$ $[_{CP}$ Op$_i$ that $[_{IP}$ ___ likes the woman]]]

linear distance between the gap and the head = 1 word

(12) Direct Object Relative

$[_{DP}$ The man$_i$ $[_{CP}$ Op$_i$ that $[_{IP}$ the woman likes ___]]] arrived.

linear distance between the gap and the head = 4 words

Hawkins (1989) found that French L2 learners were more accurate with subject relative clauses (that use relative pronoun *qui*), see (13), whose distance between the head and the gap is shorter than that in object relative clauses (that use relative pronoun *que*), see (14).

In addition, like ORCs in Spanish, French ORCs also occur with SV inversion, known as "stylistic inversion" (Kayne & Pollock, 1978). Hawkins found that French L2 learners were more accurate with ORC without stylistic inversion, as in (14), than with ORC with stylistic inversion, as in (15), and that accuracy with ORC with stylistic inversion increased as L2 French proficiency increased.

(13) L'homme qui _____ connaît Pierre.
El hombre que _____conoce a Pierre

"The man who knows Pierre."

(14) *L'homme que Pierre connaît_____*. French no SV inversion
El hombre que Pierre conoce_____. Spanish no SV inversion

"The man who Pierre knows."

(15) *L'homme que connaît _____ Pierre.* French with SV inversion
El hombre que conoce_____ Pierre. Spanish with SV inversion

"The man who Pierre knows."

Hawkins explains that L2 learners were sensitive to the linear distance between the head and the gap, and that they relied on surface word order when parsing these structures. That is, learners performed better with subject relative clauses, which have the shortest distance between the head and the gap. But learners were also more accurate with ORCs without SV inversion, which have a longer distance between the head and the gap than ORCs with SV inversion. This latter result is best explained assuming that when learners parse relative clauses and they see a NP, they interpret it as a subject. When they see the verb next, the expectation (because subject

relative clauses are presumably more frequent than object relative clauses) is that it is the action performed by the subject. The object relative clause starts with the object and then includes the verb followed by the subject. This [$_{CP}$NP [$_{IP}$V NP] order is perceived by learners as [$_{CP}$ S [$_{IP}$V O] because it is the parsing with the lighter memory load (Grodner & Gibson, 2005; Hawkins, 1989; O'Grady, 2011).

Although the present study does not focus on real-time processing of relative clauses, based on the finding that SRCs are easier to relativize than ORCs, I assume that the factors contributing to the processing of these clauses may also affect the ability to comprehend them.

3.1.3 L1, L2 and HL Acquisition of Spanish relative clauses

Monolingual Spanish speakers acquire relative clauses early, at around 3 years of age (Grinstead & Elizondo, 2001—cit. in Perpiñán (2008):p.117—; Guasti & Cardinaletti, 2003; Gutierrez-Clellen & Hoftstetter, 1994; Pérez-Leroux, 1993). Guasti & Cardinaletti (2003) showed that young children from ages 4;5 to 10;0, acquiring Italian and French, were able to produce adult-like SRC and ORC, particularly. In a developmental study of oral narratives that included different age groups (i.e. groups of 3, 5 and 9-year-old children and adults) of native speakers of Spanish, German, Hebrew, English and Turkish Sebastián & Slobin (1994) and Dasinger & Toupin (1994) found that although all children in the 3-year-old group produced relative clauses, the Spanish speakers produced the most. They found that the use of relative clauses increased with age and explained that the frequency of use of these clauses correlates with the relative complexity of the construction. Because Spanish and Hebrew have the fewest constraints regarding the relative pronoun, word order and agreement, children produce more relative clauses in these languages earlier and more frequently than in other languages.

Merino (1983) also showed that Spanish-English bilingual children ages 5;0 – 9;0 (with Spanish as a heritage language) had knowledge of subject-subject relatives (e.g. *The tiger that grabs the lion is pushing the horse*) and object-object relatives (e.g. *The donkey that bites the horse that the lion pushes*). She measured comprehension and production in English and Spanish using the Bilingual Language Acquisition Scale and focused on the following morphosyntactic features in both languages: number and gender, tense, word order, relative clauses, conditional and the Spanish subjunctive. Merino tested only three items for each type of relative clause. Her results showed that proficiency in Spanish production increased from Kindergarten to 1st-3rd grades and in 4th grade it declined to the kindergarten level; whereas, English continued to improve following patterns of normal language acquisition. She did not specify whether the decline in production of relative clauses was due to a decline in production of object-object relative clauses or a decline in both, subject-subject and object-object relative clauses. Interestingly, although Merino found a decline in relative clause production, she did not find a decline in comprehension of these structures. Thus, younger children were able to comprehend and produce these relative clauses, and, although 4th grade Spanish HS stopped producing relative clauses, they still had the ability to comprehend them.

Similarly, Gutierrez-Clellen & Hofstetter (1994) studied syntactic complexity in Spanish by analyzing the use of subordination and phrase elaboration in oral narratives of 77 Puerto Rican and Mexican American bilingual children. These children, who had limited English proficiency according to the Language Assessment Battery and the Idea Oral Language Proficiency Test, were enrolled in bilingual programs in preschool, 1st grade and 3rd grade. Their mean ages were 5.1, 6.6 and 8.6, respectively. The authors elicited oral narratives by asking them to watch the 7-minute-long silent film *Frog Goes to Dinner* and then narrate it. Their data

showed that Spanish HS in third grade produced mostly subject-subject relative clauses. Thus, there is no reliable data about use of ORC in English-Spanish bilingual school-age children and in adults. To sum up, at this point research has shown that early English-Spanish bilinguals do comprehend and are able to produce subject-subject relative clauses by the time they reach the fourth grade. Research has also shown that they are able to comprehend ORC.

Research on heritage language acquisition of subject and object relative clauses is limited to Polinsky (2011) and O'Grady et al. (2001). Polinsky (2011) conducted a study of English-Russian bilingual children (of approximately 6 years of age) and English-Russian bilingual adults, using a picture-matching comprehension task presented in printed slides. Participants had to hear a sentence describing an action and choose one of two pictures matching the description. Both groups were English dominant heritage speakers of Russian. She found that children comprehended SRC and ORC in Russian at native levels. By contrast, the adult HS did not show native-like comprehension of ORC. Because the children showed comprehension of ORC, these data suggested that in adults these structures may have undergone attrition in their heritage language along their lifetime. Similarly, O'Grady et al. (2001) studied adult Korean heritage speakers administering a picture-matching task as well, but in a booklet format, and found that these speakers also comprehended subject relative clauses better than object relative clauses. To explore if this was the case in Spanish, Sánchez-Walker (2013) studied comprehension of SRCs and ORCs in Spanish using a picture-matching task presented in the psycholinguistics program E-Prime. As explained in section 3.1.1, Spanish SRCs and ORCs can be written with two VO and SV inversion, respectively. The one without inversion matches English subject and object relative clauses, see (16) and (18) and the other does not, see (17) and (19). Participants heard a sentence and had to match it to one of two drawings presented on a computer screen. Eight HL

learners of intermediate proficiency were tested. Results showed that all HL learners comprehended the subject and object relative clauses without inversion, S(VO) and O(SV), respectively, with the English-matching word order. HL learners with two Spanish speaking parents (N=4) were more accurate in the comprehension of object relative clauses with inversion, O(VS), see (19), than those with only one Spanish-speaking parent (N=4). These results indicate that, at intermediate proficiency levels, language experience (i.e. parental input) is related to HL learners' indeterminacy in the comprehension of object relative clauses O(VS). Results of ORCs are similar to Hawkins's (1989), even though the linear distance between the head and the gap in ORCs with inversion, see (19), in shorter than that of ORCs without inversion, see (18), HL learners were more accurate with the latter.

(16) Subject Relative S(VO) *El submarino*$_{\text{NOUN}}$ *que hundió*$_{\text{VERB}}$ *los barcos*$_{\text{NOUN}}$.
"The submarine that sank the boats".

(17) Subject Relative S(OV) *El submarino*$_{\text{NOUN}}$ *que los barcos*$_{\text{NOUN}}$ *hundió*$_{\text{VERB}}$.
"The submarine that sank the boats".

(18) Object Relative O(SV) *El submarino*$_{\text{NOUN}}$ *que los barcos*$_{\text{NOUN}}$ *hundieron*$_{\text{VERB.}}$
"The submarine that the boats sank".

(19) Object Relative O(VS) *El submarino*$_{\text{NOUN}}$ *que hundieron*$_{\text{VERB}}$ *los barcos*$_{\text{NOUN}}$.
"The submarine that the boats sank".

With regards to L2 learners, Liceras (1986) investigated acquisition of relative clauses by English-speaking L2 college learners of Spanish. She tested 3 groups of L2 Spanish learners (i.e. 15 beginners, 15 intermediate and 15 advanced) and 5 native speakers using three instruments, namely, a translation task, a grammaticality judgment task and a fill in the blank task. She found a correlation between proficiency in Spanish by L2 learners (English speakers) and mastery of relative clauses in Spanish. Similarly, Sánchez-Walker & Montrul (2016) found that as the Spanish proficiency of college level L2 learners increased so did their comprehension of subject

and object relative clauses. Sánchez-Walker & Montrul (2016) tested comprehension of subject and object relative clauses, in 20 Spanish L2 learners, 11 of intermediate proficiency and 9 of advanced proficiency, using the same relatives and picture matching task used in Sánchez-Walker (2013). Sánchez-Walker & Montrul (2016) found that all learners comprehended oral subject and object relative clauses whose word order matched that of English relatives, the subject and object relative clauses without inversion, S(VO) and O(SV), respectively. See (16) and (18). Only advanced proficiency L2 learners comprehended the object relative with SV inversion, O(VS), as in (19). Intermediate proficiency L2 learners wrongly interpreted (19) as a subject relative. Thus, the main result of this study was that at intermediate proficiency levels L2 learners interpreted object relative clauses with word order O(VS) as subject relative clauses with word order S(VO), and that comprehension of this relative clause, like the French learners in Hawkins's (1989), increased as proficiency increased. This indicates that, as proficiency increases, L2 learners' difficulty using inflectional morphology to correctly comprehend this clause is overcome, which could be explained by the general belief that as proficiency increases so does their working memory in Spanish (Ortega, 2009).

3.2 Passive Clauses

Although having the same meaning, passive sentences (The ball was kicked by the boy) are structurally more complex than their active forms (The boy kicked the ball). Syntactic movement of the subject and object noun phrases re-orders the typical SVO word order in many languages (Grodzinsky, 2000; Ud Deen, 2011). This syntactic movement may require comprehenders to reassign semantic roles that were initially based on sentence position and properties of the noun (e.g., sentence initial, animate noun phrases tend to be agents) (Huang, Zheng, Meng, & Snedeker, 2013). Passivization involves the presence of an auxiliary verb and a

past participle with its related morphology, which in English is often formally the same as the morphology for the simple past. In Spanish, the participle has gender and number agreement (La pelota fue pateada por el niño 'the ball$_{[FEM\ SING]}$ was kicked$_{[FEM\ SING]}$ by the boy'), which adds comprehension complexity compared to English, especially if the two noun phrases are animate. Furthermore, Spanish is a null subject language and can have VS order (Fue alimentada$_{[FEM\ SING]}$ la abuela$_{[FEM\ SING]}$ por el hombre) or appear with no subject (Fue alimentada$_{[FEM\ SING]}$ por el hombre). Passives have been the focus of many language acquisition studies (Crain, Thornton, & Murasugi, 2009; Crawford, 2012; O'Grady, 1997; Pinker, Lebeaux, & Frost, 1987; Ud Deen, 2011).

A passive clause shifts the focus to the patient of the action by reorganizing the thematic roles and grammatical relations while leaving the logical relation between the elements of the sentence intact. That means that the agent and subject, and the direct object and theme from an active sentence like (20) become the agent and oblique prepositional phrase, and the subject and theme, respectively, in a sentence like (21). (Examples (20) and (21) adapted from O'Grady 1997)

(20)	subject		direct object
	The boy	kicked	the ball.
	agent		**theme**

(21)	subject		oblique prepositional phrase
	The ball	was kicked	(by the boy).
	theme		**agent**

As shown in (21), the verbal phrase of a passive clause in English is formed with the auxiliary verb ‘to be’ and the past participle of a transitive verb (O’Grady, 1997). Passives can be expressed without the oblique prepositional phrase (‘by’-phrase) to become short or truncated passives, as in (22). In a passive clause the object (theme) gets its thematic role from the verb and then becomes the subject because it moves to the specifier position of the tense phrase (TP) to check the nominative case leaving a trace, this is also known as A-movement. The participial form absorbs the agent role, thus there is no need for an agent. However, the agent can be added as an adjunct prepositional phrase.

(22) The ball$_i$ was kicked h$_i$. Truncated/short passive

According to O’Grady the main complication of English passive sentences, besides the reorganization of the elements of the sentence, is the fact that a passive sentence can be either adjectival or verbal. Adjectival passive clauses denote a state, and are also known as stative passives. This construction does not involve a syntactic movement. Verbal passives denote an event, and are also known as eventive passives. This construction involves a syntactic A-movement.

Even if verbal and adjectival passive clauses have the same structure on the surface, they are not the same. The adjectival passive is congruent with adjectival constructions. Wasow (1977) introduced how to analyze the difference between adjectival and verbal passives: adjectivized participles, unlike participles in verbal passives, can be expressed with the negative prefix ‘un-’, or with degree words (i.e. very), see examples (25) and (26) adapted from (O’Grady, 1997).

Verbal Passives

(23) The book was put on the shelf. *The book was unput on the shelf.

(24) Harry was hit by the ball. *Harry was very hit by the ball.

Adjectival Passives

(25) The island is inhabited. The island is uninhabited.

(26) The teacher was annoyed. The teacher was very annoyed.

In Spanish the passive clause can be formed with two structures. One is the reflexive passive, also known as a morphological passive or se-passive (in which the subject and object are the same), see example (27) from Pierce (1992).[7]

(27) *El libro se escribió en México.* reflexive/morphological passive
'The book was written in Mexico.'

The other is the periphrastic passive (formed with auxiliary verbs *ser* and *estar* and a past participle), the focus of this study. Passive clauses with *ser* parallel the English passive. The agent and subject, and the direct object and theme in the active sentence, as in (28), become the agent and oblique prepositional phrase, and the subject and theme, respectively, in the passive sentence, as in (29). In both languages a patient is the syntactic subject, there is the auxiliary verb 'to be' and the past participle of a transitive verb.

(28) Active

subject		**direct object**
El autor	*escribió*	*el libro.*
"The author	wrote	the book."
agent		**theme**

[7] See Mendikoetxea (2012) for more on this structure and Tremblay (2006) and references therein for L2 acquisition studies of this structure.

(29) Passive

subject		**oblique prepositional phrase**
El libro$_i$	*fue escrito h$_i$*	*(por el autor)*.
The book	was(*ser*PRETERITE) written	(by the author).
theme		**agent**

As in English, Spanish has adjectival (stative) and verbal (eventive) passives. But unlike English, each passive is expressed with a different copula. Stative passive clauses are expressed with the verb *estar,* as in (30). The past participle in the stative passive describes a state. Eventive passives are expressed with the verb *ser*, as in (29) and (31). Each verb brings its own temporal interpretation of the clause. The stative passive presents a result state, while the eventive passive presents an event that occurred or is occurring during a specific time.

These two types of passive clauses bring the action to the fore by removing the agent, as in (30), or by removing or displacing it to form a truncated or short passive (i.e. the 'by-phrase' is optional), see (31).

(30) La casa estaba edificada. *Adjectival/ Stative Passive*

The house was (estar.IMPERFECT) built.

"The house was built."

(31) La casa era edificada (por la compañía). *Verbal/Eventive Passive*

The house was (ser.IMPERFECT) built (by the company).

"The house was being built (by the company)."

Stative passives remove the agent completely, they do not carry an implicit agent, and having a displaced agent renders them ungrammatical, as in (32).

(32) *La casa estaba edificada por la compañía.

The house was (estar.IMPERFECT) built by the company.

"The house was built by the company.

However, there are exceptions. Varela (1992) explains that there are participles ending in *-do* that are derived from intransitive verbs, see (33). Some transitive verb participles ending in *-do* have a passive interpretation depending on the context, (34)-(36). And, although it is stated that adjectival/stative passives with a 'by'-phrase are ungrammatical, they are grammatical when the 'by'-phrase includes a generic or collective referent, see (37). Examples from Varela (1992) p. 226-227.

(33) *atrevido* 'daring', *decidido* 'courageous'

(34) *una mujer muy leída,* 'a (well) read woman'

(35) *un escritor muy leído por todo el mundo*
'a writer read by everyone'

(36) *un libro leído por todo el mundo*
'a book read by everyone'

(37) *La casa está construida por obreros cualificados.*
'The house is built by qualified workers.'

Regarding acceptance of the 'by'-phrase, a recent explanation of the argument structure of adjectival passives points out that there are other contexts in which a 'by'-phrase is accepted with an adjectival passive (García-Pardo, 2017). He explains that a sentence like (38) is acceptable because it has a collective referent. However, also acceptable are sentences (39) and (40) without a collective referent. García-Pardo (2017) explains that the grammaticality of the 'by' phrase depends on *Aktionsart*, adjectival participles from stative causatives verbs accept 'by'-phrases and participles from change of state verbs do not.

(38) *La ciudad está protegida por los ciudadanos*.

'The city is$_{[estar]}$ protected by the citizens'.

(39) *El document está firmado por el embajador*.

'The document is$_{[estar]}$ signed by the ambassador'.

(40) *El garaje está vigilado por el guardia*.

'The garage is$_{[estar]}$ surveilled by the guard'.

3.2.1 Acquisition of Passive Clauses

Although passive clauses are not frequent in parental input, English-speaking children acquire adjectival passives—e.g. 'Now it's fixed' (Israel, Johnson, & Brooks, 2001)— and irreversible eventive full passives or passives in which the Agent could never be the Theme—e.g. 'The branch is carried by the bird.' The branch cannot carry the bird, only the bird can carry the branch (From Turner & Rommetveit (1967) in O'Grady (1997)—by 3 years of age (Crain et al., 2009; Crawford, 2012; Israel et al., 2001; Pierce, 1992; Ud Deen, 2011). O'Grady (1997) summarizes representative studies of acquisition of passive clauses in English and states that passive clauses with actional verbs (e.g. 'push', 'touch') are acquired before passives with non-actional verbs (i.e. experiential verbs such as 'hear', 'see'). Actional verbs clearly show that the theme argument is affected by the actions of the agent. In the sentence 'The curtain was hung by Maria', the curtain changed states from not being hung to being hung. Non-actional verbs do not affect the theme argument directly. In the sentence 'The curtain was seen by Maria' the curtain is not affected. In addition, reversible eventive full passives or passives in which either of the two noun phrases could be the subject of the passive sentence (e.g. 'José was pushed by Mario.' or 'Mario was pushed by José.') tend to be acquired later by 5 or 6 (Pierce, 1992), and eventive full passives with non-actional verbs—i.e. 'The orange owl was seen by Wally Gator.' From

Sudhalter & Braine (1985)— by 7 years of age (Crawford, 2012). Israel et al. (2001) indicate that acquisition of the passive participle in English follows a developmental path in which children first use participles as adjectives and later evolve to construct passives with true eventive or verbal participles. They suggest that children first use the participles as adjectives because adjectives are easier to conceptualize as observations, a description of a state, the result of an action.

Studies have shown that stative passive clauses in Spanish (*Él está colgado de la cabra*, He is hung from the goat) are acquired by 4 years of age (Berman & Slobin, 1994, p.272); irreversible eventive full passives in Spanish (e.g. *Maria fue lavada por Juan* 'Maria$_{[FEM\ SING]}$ was washed$_{[FEM\ SING]}$ by Juan') by around 3 years of age; and reversible eventive full passives (e.g. Maria fue lavada por Laura 'Maria$_{[FEM\ SING]}$ was washed$_{[FEM\ SING]}$ by Laura$_{[FEM\ SING]}$') by 5 or 6 years of age (Pierce, 1992). Eventive passives in Spanish are quite infrequent in the input and are typically used in writing, and formal contexts (i.e. newspapers, literature, etc.) (Pierce 1992). Their use becomes productive after exposure to written language (Jisa, Reilly, Verhoeven, Baruch, & Rosado, 2002; Tolchinsky & Rosado, 2005).

Regarding L2 acquisition of these clauses, Briscoe (1995) states that to understand eventive passive clauses Spanish speakers have to know that the first noun phrase is not the agent, but the object, and that the agent, if included, comes after the by-phrase. They also have to know the appropriate *ser* form corresponding to the timing of completion of the action (e.g. the imperfect form *era* refers to an action that is ongoing or habitual in the past, the irregular preterite form *fue* refers to an action carried out in the past). They also have to know that the past participle has to agree in number and gender with the object and that it carries the meaning of the passive voice. To show understanding of the stative passive (i.e. *estar* + stative adjectives like

triste, 'sad'—including participles like *cansada* 'tired') learners have to realize that a description follows the copula *estar*.

Briscoe identified eleven *ser* functions and three *estar* functions in the stages of L2 acquisition of the copula from data collected of 77 L2 learners of Spanish in different academic levels of Spanish instruction (1st- 3rd year of instruction and advanced undergraduate courses). According to her data, *ser* in passive clauses was the last *ser* function to be acquired. The author explains that it takes longer to acquire eventive passive clauses because they violate twice the rule Canonical Order Strategy proposed by Clahsen (1984), which is part of three hierarchical processing strategies that learners have to overcome as their L2 develops[8]. This rule in R. Ellis (2008, p.459-460) states that:

"*No permutation or reordering of constituents in a structure occurs; utterances manifest a 'basic' order that reflects the direct mapping of meaning onto syntactic form. This strategy blocks the interruption of the underlying structure*."

Spanish is an SVO language. Briscoe explains that constituents of a subject, a verb and an object have to stay within the domain of this subject, verb and object. According to her in a verbal passive there are two reordering of constituents or two violations to the Canonical Order Strategy: the subject (agent) is at the end of the sentence, preceded by the verb, which is in turn preceded by the object (theme), that is an OVS word order instead of SVO. In other words, these two violations of the Canonical Order Strategy point out that the reordering of the thematic roles in a verbal passive is challenging for L2 learners.

Another factor to consider is that regarding aspectual domain. English and Spanish map meaning to form differently. As Montrul (2008a) explains the ambiguity of the copula *be* in English to instantiate aspectual distinctions, through morphology or other elements in the

[8] See Ellis (2008) pages 459 – 460.

sentence, is problematic for the acquisition of the aspectual distinction of the copulas in Spanish[9]. In Spanish *estar* is marked as perfective (Bruhn de Garavito & Valenzuela, 2008), and is considered an aspectual auxiliary (Lema, 1992). The attribute introduced by *estar* is a result that is already there, an action completed or a quality showing, on the subject. In example (41), the use of *estar* means that the state of the cooking is completed, the chicken is cooked. The chicken is in a state that resulted from a previous action (cooking). The participles preceded by *ser*, on the other hand, can be imperfective or perfective (Bruhn de Garavito & Valenzuela, 2008). Used as an auxiliary in the passive clause, *ser* emphasizes the action that is occurring, there is no reference to an onset or an endpoint: in (42), for instance, the action of being cooked. Note that the point in time when this ongoing action or event is taking place is determined by the tense used, if the passive is constructed (i) with the canonical past tense *fue*,[10] then the emphasized action has already occurred, (ii) with the present tense *es*, it is occurring now, (iii) with the imperfect tense *era*, it was occurring in the past. See examples of English passive clauses adapted from Bruhn de Garavito & Valenzuela (2008). The mapping problem for L2 learners of Spanish is that English encodes in one form, 'was', what Spanish encodes in two forms, *ser* and *estar*. Montrul (2008a) summarizes L2 learners' task of learning verbal passive clauses in Spanish:

> *"In restructuring their grammars, English-speaking learners of Spanish have to first learn the two new morphological forms, realize that they are in complementary distribution, and then reassemble the way they map meaning onto form. Such a three-stage task involves the coordination of grammatical knowledge at the interface between morphology, semantics and syntax, and causes obvious delays in acquisition."*

[9] See Archer, Fábregas, & Marín (2019) for more on complexity of copulas.
[10] *Fue*, the 3rd person preterite tense of *ser*, is the canonical past tense for this passive clause.

(41) The chicken was cooked. [resulting state]
El pollo estaba cocinado.

(42) The chicken was cooked in a coal stove. [finished event]
El pollo fue cocinado en un fogón.

(43) The chicken was (being) cooked in a coal stove. [ongoing event]
El pollo era cocinado en un fogón.

Bruhn de Garavito & Valenzuela (2008) investigated the acquisition of these passive clauses with an Acceptability Judgment Task (AJT)[11] in which native speakers and advanced L2 learners had to evaluate the acceptability of 40 grammatical sentences and 30 ungrammatical sentences on a scale from 1 (totally unacceptable) – 5 (totally acceptable). Results showed that advanced L2 learners and native speakers accepted stative passives with *estar* in the present tense as in (44) with a mean score close to 4 out of 5. L2 learners were less accepting of adjectival passive clauses with *estar* in the imperfect tense, as in (45), with a mean score of approximately 3.5 out of 5, whereas native speakers mean acceptance score was closer to 4.5.

(44) *La cena ya está preparada para la fiesta*.
the dinner already is prepared for the party
'The dinner is already prepared for the party.'

(45) *Ayer la comida estaba servida en la mesa*.
yesterday the dinner was$_{[imperfect]}$ served on the table
'Yesterday the dinner was served on the table.'

L2 learners were less accepting of eventive passives without an agent. Their mean score for the acceptability of eventive passives in the present tense, as in (46), was approximately 3, and that

[11] Even though they used a GJT Brunh de Garavito and Valenzuela acknowledge that in this case they were actually testing preference.

for native speakers was 4.5. Their acceptance of eventive passives in the imperfect tense, as in (47), was lower for both groups, with L2 learners' mean acceptability score being a little above 2, and that of native speakers being a little below 2.

(46) En el consulado los documentos son entregados durante las horas de oficina.
in the consulate the documents are handed in during the hours of office
'In the consulate documents are handed in during office hours.'

(47) El libro era escrito en inglés.
the book was$_{[imperfect]}$ written in English
'The book was written in English.'

Both groups' mean acceptability scores for canonical passive with *fue* was above 4.

(48) El libro fue escrito en Inglaterra.
the book was$_{[PRETERITE]}$ written in England
'The book was written in England.'

Native speakers considered eventive passive clauses with *ser* in the present tense more acceptable than L2 learners did, which means that L2 learners were not completely sure whether these sentences were grammatical. And even though the eventive passives with *ser* in the imperfect tense are grammatical, both L2 learners and native speakers found truncated eventive passive clauses with *ser* in the imperfect tense ungrammatical. L2 learners found both passive clauses more acceptable in the present tense than in the imperfect tense, and they accepted the adjectival passive more in both tenses. These results show that L2 learners had difficulty with eventive passives, but it is not known whether they truly understand them or not.

Assuming that native speakers understand eventive passives, it is clear that they prefer them in the present tense. They do not show any substantial preference for the grammaticality of

eventive and adjectival passive clauses in the present tense (mean scores 4.5 and 4, respectively). They accept adjectival passive in the imperfect tense, but not the eventive passives. To confirm that native speakers dislike eventive clauses in the imperfect tense, but understand that they refer to an ongoing action, I conducted a pilot study using a Picture Matching Task that consisted of eighteen sentences (five eventive passives with *ser* in the imperfect tense, five stative passives with *estar* in the imperfect tense, and eight distractor sentences) and their corresponding drawings depicting a finished or ongoing action. The task was administered to five native speakers from Puerto Rico (age range: 31- 60 years of age). Results show that native speakers do understand the distinction between eventive and stative clauses with the copulas in the imperfect tense. See Figure 1.

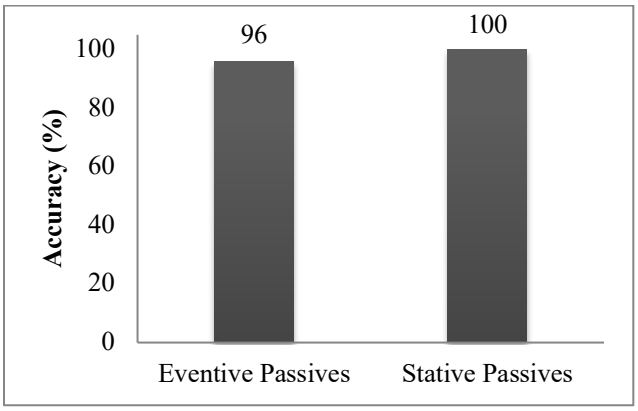


Figure 1. Five native speakers' mean accuracy in the comprehension of passive clauses

With respect to heritage speakers, Silva-Corvalán & Montanari's (2008) longitudinal data from a Spanish-English bilingual child between the ages 1;6 and 2;11 shows production of a passive clause in Spanish without the copula *ser* at age 2;1, and in a priming study Vasilyeva et al. (2010) showed that by ages 5;2 – 6;5 children have integrated the representation of full passive clauses in Spanish. In Vasilyeva et al. (2010) bilingual Spanish-English speaking

children were presented 10 drawings depicting actions after hearing the experimenter say a full passive sentence in Spanish (e.g. *El árbol fue golpeado por el rayo*; The tree[MASC SING] was struck[MASC SING] by lightning.) and they had to describe the sentence in English. Results showed that processing the passive clause in Spanish activated the corresponding English form, and these children described the drawing with the passive clause in English more than when they were primed with an active clause. They were not primed in the English-Spanish direction, but as the authors explain, this could have been because in Spanish the use of the passive clause is more infrequent that in English. But even if they have integrated the representation of the canonical full passive, bilingual children experience a delay in acquiring the semantics of *ser* and *estar*. Krasinski's (2005) case study on her English-Spanish bilingual child growing up in a Spanish speaking country found that it took him longer than it took monolingual kids to acquire the semantic distinction between *ser* and *estar* by age 4;2. Silva-Corvalán & Montanari (2008) found that while the Spanish-English bilingual child produced adjectival participles (e.g. *mojado* 'wet', *tapada* 'covered', ending in *-ado/-ido*) with the verb *estar* exclusively, he also showed delayed acquisition of *estar*. These data suggest that even if they have integrated the representation of the canonical passive (e.g. *La casa fue edificada por la compañía*, 'the house was built by the company') they struggle with the distinction between *ser* and *estar*, which is essential to understanding the experimental clauses in the current study.

Indeed studies on adult early bilinguals show that this is the case. Valenzuela et al. (2015) replicated Bruhn de Garavito & Valenzuela (2008) and administered the Acceptability Judgment Task to twenty-two heritage speakers of Spanish with near native proficiency. Results showed that even though they accepted eventive passive clauses with *ser* in the present tense as grammatical, rating them with a mean score of ~3.8 on a scale of 1 (totally unacceptable) to 5

(totally acceptable). And they also accepted stative passive clauses with *estar* in the present tense, mean acceptability score of ~4.2 Their mean acceptability score for stative passive clause in the imperfect tense was ~4.25, and that of eventive passive clause in the imperfect tense was ~2.7. But with these results, same as with the 2008 study, it cannot be stated whether heritage speakers considered the eventive passive with *ser* in the imperfect tense ungrammatical or just not preferable. See Table 2 for summary of L2 and HL learners mean acceptability of verbal and adjectival passive clauses ratings on a scale from 1 (totally unacceptable) to 5 (totally acceptable); taken from tables in Bruhn de Garavito & Valenzuela (2008) and Valenzuela et al. (2015).

Table 2 *Acceptability ratings* for verbal and adjectival passives from previous studies*[12]

Passive Clause	**NS****	**L2L****	**HLL****
En el consulado los documentos son entregados durante las horas de oficina. "In the consulate documents are handed in during office hours."	4.6	2.9	3.8
En el consulado los documentos son entregados por la secretaria. "In the consulate documents are handed in by the secretary."	4.5	3.3	3.9
El libro fue escrito en Inglaterra. "The book was written in England."	4.5	4.2	4.3
*El libro **era** escrito en inglés.* "The book was written in English."	**2.0**	**2.3**	**2.7**
*Ayer la comida **estaba** servida en la mesa.* "Yesterday the dinner was served on the table."	**4.4**	**3.3**	**4.2**
La cena ya está preparada para la fiesta. "The dinner is already prepared for the party."	3.9	3.9	4.0

*Rating based on a scale of 1 (totally unacceptable) to 5 (totally acceptable)
**NS = native speakers, L2L= second language learners, HLL= heritage language learners

3.2.2 Passive Clauses with Copulas in the Imperfect Tense

The imperfect tense is problematic for L2 learners (Montrul & Perpiñán, 2011; Montrul & Slabakova, 2003) and heritage speakers of Spanish (Merino, 1983; Montrul & Perpiñán, 2011; Silva-Corvalán, 1994, 2003). Montrul & Perpiñán (2011) specifically tested acquisition of preterite and imperfect morphology and their semantic implications by L2 learners and heritage speakers of Spanish. 60 heritage speakers and 60 L2 learners matched for proficiency and divided accordingly in low, intermediate and advanced proficiency completed two morphology recognition tasks (tapping metalinguistic knowledge) and two sentence judgment tasks that focused on semantic implication of these tenses (tapping implicit knowledge). Results show that L2 learners recognized the imperfect morphology better than the heritage learners did. But, heritage speakers of low and intermediate proficiency showed better understanding of the

[12] Bruhn de Garavito & Valenzuela (2008) and Valenzuela et al. (2015)

preterite/imperfect contrast than their L2 learner counterparts. The difference was not attested in the advanced proficiency group. Using the same tasks, similar results were observed in Montrul & Slabakova (2003) in which performance of L2 learners of Spanish with near native proficiency was indistinguishable from the native speakers'. These studies show then that although difficult, the semantic implications of the imperfect tense can be acquired by L2 and heritage learners of Spanish.

As mentioned above, when both passives are in imperfect tense the adjectival passive refers to a finished action, a description of a state. The imperfect tense is used because this tense is difficult for L2 learners and HL learners, and there is data that shows that L2 learners and HL learners disprefer the use of verbal passive clauses with the copula in the imperfect tense (Bruhn de Garavito & Valenzuela, 2008). The verbal passive refers to an ongoing action.[13] Results from Bruhn de Garavito & Valenzuela (2008) and Valenzuela et al. (2015) show that speakers at advanced proficiency levels accept eventive passive clauses with the canonical *fue*. This means that they are familiar with the verbal passive construction. These results also show that they accept stative passive clauses in the imperfect tense as grammatical. So, to understand the difference between stative and eventive passive in the imperfect tense these speakers have to identify the functions of *ser* in these constructions. This study aims to find out whether L2 and HL learners know that '*ser* + participle' refers to an ongoing action. Based on results from previous studies I assume that L2 and HL learners know: that meanings conveyed by 'was' in English are conveyed by *ser* or *estar* in complementary distribution in Spanish; that '*estar* + participle' refers to the result of the action described by the participle. Brunh de Garavito and Valenzuela also point out that this understanding means that learners have to access the

[13] This is also true for stative and eventive passives in the present tense.

interpretation related to the morphology and semantics of the copulas. They need to know that *ser* is not characterized by imperfectivity or perfectivity; and that *estar*, unlike *ser*, is characterized by perfectivity. Thus, comprehension of these clauses depends not only on knowing the tenses of the copulas, but also on knowing the change in meaning in the passive clause according to the copula used.

3.3 Comprehension of relative and passive clauses

Comprehension of relative and passive clauses entails knowledge of word order, inflectional morphology, and, for the passive clauses in particular, the semantics of *ser* and *estar*. Studying these constructions gives us insights into HL and L2 learners' linguistic intuitions with structures of later language development.

The use of S(OV) or S(VO) word order in subject relative clauses is based on stylistic choices (e.g. to make verses rhyme). With object relative clauses the choice of O(SV) and O(VS) word order is for different reasons. Gutiérrez-Bravo (2003) explained the constraints that produce O(SV) and O(VS) word order in object relatives. He first explains that the object relative clause with SV inversion, O(VS), is the unmarked word order because when the whole sentence is in focus, constituents emerge in their unmarked word order. Being in focus means that sentence is new information. But, based on an Optimality Theory analysis, he adds that object relative clauses unmarked word order is O(VS) because of prosody-induced factors. He also indicates that TOPICFIRST constraints dominate the prosody induced factors, which is why object relatives also show an O(SV) word order. This explains why the English-matching word order O(SV), although being the marked word order, is felicitous when the subject is a sentence topic. Speakers have to map the syntax of the object relative and its morphological cues for correct comprehension of this clause.

Sánchez-Walker (2013) found that L2 and HL learners with intermediate proficiency interpreted object relative clauses with SV inversion, O(VS), as subject relative clauses. I attributed this difficulty to two factors (i) their inability to integrate inflectional morphology and (ii) possible crosslinguistic influence (they overgeneralized the English rule for subject relative clauses when reading the object relative clause with SV inversion). However, L2 learners parsing of the ORC with OVS order as a subject relative could also be explained by the learners' limited working memory capacity when they have not reached high proficiency levels. Their working memory solves the gap in the sentence as a subject gap, because it is the easiest structure to form reducing the working memory load. As L2 learners' proficiency increased so did their ability to comprehend the object relative clause with SV inversion, O(VS).

Constructing a passive clause involves the reorganization of the thematic roles and grammatical relations while leaving the logical relation between the elements of the sentence intact. Syntactically, passive clauses would always be harder to process than active sentences. Although, L2 and HL learners are familiar with passive voice structures because (i) English has verbal and adjectival passive clauses with a syntactic structure that is similar to Spanish's; and (ii) because L2 and HL learners have shown that they are familiar with the canonical passive with *fue* in Spanish. Nevertheless, comprehension of verbal passive clauses requires not only knowledge of its syntax, but also of the complementary distribution of *ser* and *estar*. Acquiring the complementary distribution of the copulas is a hard task for L2 learners and HL learners as they need to acquire not only their irregular inflectional morphology but also the contrasts between each copula regarding syntax, semantics and pragmatics. As Silva-Corvalán (2014) indicates, these contrasts are not present in English. L2 learners struggle to learn and understand all the intricacies of the copulas' grammar and use, and L2 instructors struggle to teach them

(Montrul, 2008a). This means that L2 learners and, to that effect, HL learners in the same classroom are not taught in detail the complementary distribution of the copulas in grammar constructions.

Bruhn de Garavito & Valenzuela (2008) and Valenzuela et al. (2015) investigated verbal and adjectival passive clauses' acceptance by advanced L2 and HL learners and found that these learners have not completely acquired the semantic constraints carried by the aspectual distinction between *ser* and *estar.* Their results show that adjectival passives are rated as acceptable by both groups of learners (although L2 learners acceptance ratings for these clauses were lower than HL learners', see Table 2). Acceptance ratings of verbal passive clauses in the imperfect tense were low for both groups (see Table 2). Greater acceptance of adjectival passives can be explained by the fact that adjectival passives are a simpler and more frequent construction. Passive clauses trigger a reanalysis of the sentence to organize the thematic roles. This reanalysis is triggered at the past participle in English (Mack et al., 2013). In Spanish reanalysis should be triggered at the copula, if it is *ser*, it is a verbal passive and if it is *estar* it is an adjectival passive. Difficulties in the comprehension of verbal passive clauses, then should appear if learners have not yet acquired the full spectrum of copula uses.

Native speakers who grew up monolingually instinctively know what each type of passive refers to. If the learners show knowledge of *ser* and *estar's* inflectional morphology, but show difficulties in comprehending the passive clauses, the difficulties are due to their unfamiliarity with how inflected copulas are associated to their aspectual differences and semantic distribution.

This thesis investigates comprehension of these clauses in isolation. Thus, discourse pragmatics are not a factor in trying to comprehend these clauses. Instead, the main goal of this

dissertation is to find out how HL and L2 learners use their linguistic knowledge to comprehend full sentences with complex syntax. This in turn will inform us of how HL and L2 development progresses and interact with age of HL and L2 acquisition, instruction and task modality.

CHAPTER 4: RESEARCH QUESTIONS, HYPOTHESES AND PREDICTIONS

This thesis focuses on L2 and HL comprehension of two constructions that are formed with complex syntax. The first construction is the relative clause. More specifically, subject and object relative clauses that are formed with non-animated NPs and reversible contexts in which either the subject or the object could perform the action described by the verb. See examples (49)-(52) repeated below for convenience.

(49) Subject Relative S(VO) *El submarino*$_{\text{NOUN}}$ *que hundió*$_{\text{VERB}}$ *los barcos*$_{\text{NOUN}}$.
"The submarine that sank the boats".

(50) Subject Relative S(OV) *El submarino*$_{\text{NOUN}}$ *que los barcos*$_{\text{NOUN}}$ *hundió*$_{\text{VERB}}$.
"The submarine that sank the boats".

(51) Object Relative O(SV) *El submarino*$_{\text{NOUN}}$ *que los barcos*$_{\text{NOUN}}$ *hundieron*$_{\text{VERB.}}$
"The submarine that the boats sank".

(52) Object Relative O(VS) *El submarino*$_{\text{NOUN}}$ *que hundieron*$_{\text{VERB}}$ *los barcos*$_{\text{NOUN}}$.
"The submarine that the boats sank".

The sentences were designed controlling for plausibility too, thus, lacking a context that could bias one interpretation or the other, the only way for the learners to determine which NP is the subject or the object in the clause is to notice the inflectional morphology of the verb in third person singular and plural preterite tense that must agree with the subject. Only third person singular and plural verb conjugations are used.

It is generally agreed that, although many factors affect ease of comprehension of relative clauses, the linear distance between the head and the gap accounts for subject relative clauses being easier to process than object relative clauses. However, as indicated above the linear distance is not the only factor that affects comprehension of theses clauses. Hawkins (1989), showed that burden on working memory affects L2 learners parsing of relative clauses. L2 learners of French were able to identify subject and object relative clauses with a word order that

matched that of English subject and object relative clauses. But, they had difficulties identifying object relatives clauses when they featured a SV stylistic inversion, see examples (53) to (55) repeated here for convenience.

(53) L'homme qui _____ connaît Pierre. SRC
El hombre que _____conoce a Pierre
"The man who knows Pierre."

(54) *L'homme que Pierre connaît_____*. ORC - French no SV inversion
El hombre que Pierre conoce_____. ORC - Spanish no SV inversion
"The man who Pierre knows."

(55) *L'homme que connaît _____ Pierre.* ORC - French with SV inversion
El hombre que conoce_____ Pierre. ORC - Spanish with SV inversion
"The man who Pierre knows."

These data suggest that when learners with lower levels of proficiency see the NP and the following CP with a verb first, their intuition is to fill a subject gap. This tendency disappears as learners' proficiency increases. In Sánchez-Walker & Montrul (2016) L2 and HL learners of Spanish showed the same tendency. They comprehended SR (SVO) and OR (OSV), but had difficulties comprehending SR (SOV) and OR (OVS). SR (SOV) are infrequent, thus frequency played a role.[14] But regarding OR (OSV) and OR (OVS), which are both presumably equally frequent, lower proficiency L2 learners interpreted the OR (OVS) as a subject relative, and as their proficiency increased they correctly interpreted this clause as an OR. Regarding HL learners (Sánchez-Walker, 2013), those with two Spanish-speaking parents (as opposed to one Spanish-speaking parent) comprehended OR (OVS). This means that for L2 learners as their

[14] Besides the fact that in Spanish it is unusual to end sentences with a verb.

proficiency increases their intuition to incorrectly fill the subject gap in OR (OVS) disappears and their ability to notice inflectional morphology in these clauses starts to show. For HL, language quantity/quality through their childhood seems to play a role in correct comprehension of OR (OVS).

Considering English and Spanish word orders in subject and object relative clauses; the Accessibility Hierarchy's prediction that subject relative clauses are the easiest to be acquired; the finding that low proficiency learners fill in a subject gap when parsing an OR (OVS); and finally considering the distance between the head of the relative clause and the gap, the following research questions guide the study of relative clauses:

1. Are subject relative clauses easier to comprehend than object relative clauses for L2 and HL learners? and
2. Are OR (OVS) interpreted as subject relative clauses by L2 and HL learners?

Many factors affect comprehension of relative clauses. Trying to study how HL and L2 learners comprehend restrictive relative clauses in Spanish, this study was designed controlling for RCs animacy, plausibility and reversibility effects. Based on the fact that SR (SVO) and OR (OSV),[15] seem to place the least burden to working memory, these constructions are expected to be easier to comprehend than SR (SOV) and OR (OVS). Because OR (OSV) and OR (OVS) are commonly used in Spanish, this study seeks to find out whether the word order in OR (OVS) affects comprehension of this Spanish clause. SR (SOV) is not frequent, thus difficulty with this construction is expected.

Thus, L2 learners and HL learners are expected to comprehend SR (SVO) and OR (OSV) accurately. L2 learners are expected to have difficulty with SR (SOV) and OR (OVS), but their

[15] This word order is the same in Spanish and English.

comprehension of the OR (OVS) is expected to improve as their proficiency increases. HL learners' comprehension of OR (OVS) is expected to vary as a function of quality and quantity of Spanish exposure throughout their childhood, operationalized as parental/family input and Spanish instruction. HL learners are expected to have difficulties comprehending SR (SOV).

The second construction investigated in this study is the passive clause, specifically verbal and adjectival passive clauses with the copulas in the imperfect tense *era* and *estaba*, respectively. See examples (56) and (57), repeated here for convenience.

(56) La casa estaba edificada. *Adjectival/ Stative Passive*

The house was (estar.IMPERFECT) built.

"The house was built."

(57) La casa era edificada (por la compañía). *Verbal/Eventive Passive*

The house was (ser.IMPERFECT) built (by the company).

"The house was being built (by the company)."

To comprehend adjectival/stative passives with participles ending in *-ado(a)/ido(a)* (like *edificada* 'built', *cansada* 'tired', *colgada* 'hung', *colado* 'strained', among others) learners have to realize that a description of a state or final result follows the copula *estar*. L2 and HL learners accept adjectival passives with past participles (Bruhn de Garavito & Valenzuela, 2008; Valenzuela et al., 2015) because adjectival passives are a simpler and more frequent construction than verbal passive clauses.

Unlike adjectival passives that can be constructed with adjectives (like *triste*, 'sad'*)* or past participles acting like adjectives (e.g. *edificada* 'built*', colgado* 'hung'*),* verbal passive clauses are always constructed with past participles. They trigger a reanalysis of the sentence to organize the thematic roles. To comprehend verbal passive clauses L2 and HL learners have to

know that the first noun phrase is not the agent, but the object. The reanalysis is triggered at the past participle in English (Mack et al., 2013). I assume that Spanish reanalysis involves the copula. If the copula is *ser*, the clause is a verbal passive not an adjectival passive. In going back to the copula, learners have to integrate the meaning of the imperfect form *era*, which refers to an ongoing or habitual action in the past. L2 and HL learners are familiar with passive voice structures because (i) English has verbal and adjectival passive clauses with a syntactic structure that is similar to Spanish's; and (ii) L2 and HL learners have shown that they are familiar with the canonical passive with *fue* in Spanish. Nevertheless, comprehension of verbal passive clauses requires not only knowledge of its syntax, but also of the complementary distribution of *ser* and *estar*. Acquiring the complementary distribution of the copulas is a hard task for L2 learners and HL learners as they need to acquire not only their irregular inflectional morphology but also the contrasts between each copula regarding syntax, semantics and pragmatics, a contrast that is not present in English. Bruhn de Garavito & Valenzuela (2008) and Valenzuela et al. (2015) showed that HL and L2 learners acceptability ratings were high for adjectival and low for verbal passive clauses with the copula in the imperfect tense, respectively. These findings indicate that learners are either not familiar with the structure or that they do not prefer it. Thus, it remains to be investigated whether or not L2 and HL learners comprehend theses sentences, which is the third research question:

3. Are L2 and HL learners able to comprehend Spanish adjectival and verbal passive clauses with the copula in the imperfect tense?

L2 and HL learners accept adjectival passives (Bruhn de Garavito & Valenzuela, 2008; Valenzuela et al., 2015) because adjectival passives are a simpler and more frequent construction than verbal passive clauses. To comprehend adjectival/stative passives learners have to realize

that a description of a state or final result follows the copula *estar*. Difficulties in the comprehension of verbal passive clauses should appear if learners have not yet acquired the full spectrum of copula uses. Without knowledge of the distinctive use of the *ser* and *estar* in this construction, learners are expected to interpret *era* in the verbal passive clause as an adjectival passive clause, a simpler construction. This is especially true if they do not see the 'by Agent' adjunct that could facilitate an eventive passive interpretation. Given that many factors affect comprehension of passive clauses, this study was designed with truncated passive clauses with actional verbs and irreversible contexts, meaning that the theme could not perform the action stated by the verb. Instead the theme was always the object of, or was in a state resulting from, the action stated by the verb.

HL learners show advantages over L2 learners in some aspects of the HL, but this advantage cannot be generalized to all areas of grammar. This thesis investigates how HL and L2 learners comprehend complex syntax, which includes how learners parse a sentence to achieve a final interpretation. The linguistic intuition/strategy to comprehend a sentence and how it is affected by other factors is also the focus of this dissertation. Because, this thesis investigates comprehension of relative and passive clauses in isolation, discourse pragmatics are not a factor in trying to comprehend these clauses. However, extralinguistic factors, namely, age of acquisition, instruction in the L2/HL, and modality of the task affect acquisition and comprehension of these clauses by HL and L2 learners, therefore the last research question guiding this study is how do age, HL and L2 instruction and modality of tasks affect HL and L2 learners comprehension of relative and passive clauses?

Age is considered a key factor in HL and L2 acquisition. Heritage speakers acquire the HL at home with family and the community. Their input is typically informal register with

familiar and domestic words, and in some cases with language that might have already experienced language loss (Montrul, 2016; Silva-Corvalán, 1994). L2 learners' input is usually formal, and in a classroom setting. L2 learners' exposure to the L2 is typically 'modified input' by L2 instructors so that the students can understand it. L2 learners' exposure, limited to a few hours a week, with few opportunities to use the L2 orally.

Studies have shown that early exposure to the language results in monolingual-like or close to monolingual-like competence on some areas of grammar (Montrul, 2018). But, subsequent variation in input quantity and quality results in incomplete acquisition or language loss of certain areas of the HL grammar, such as structures of later language development. Thus, acquiring a HL in the United States typically results in non-convergence, similar in some aspects to that of L2 learners.

Structures of later language development are acquired early, but are developed and fully mastered at a later age, strengthened by literacy. Passive clauses and relative clauses are structures of later language development. Mastery of these structures has been shown to take a long time in L1 acquisition (Crawford, 2012; Diessel & Tomasello, 2000) and in L2 acquisition (Briscoe, 1995; Liceras, 1986). In HL acquisition mastery of these structures could be achieved and later lost, not achieved as monolingually raised native speakers do, or simply not achieved at all (O'Grady et al., 2001; Polinsky, 2011; Sánchez-Walker, 2013; Valenzuela et al., 2015).

Regarding relative clauses, HL and L2 learners comprehend SR (SVO) and OR (OSV) (Sánchez-Walker, 2013; Sánchez-Walker & Montrul, 2016). SR (SOV) and OR(OVS) were comprehended by HL with two Spanish-speaking parents and L2 learners with advanced proficiency. Thus, it could be argued that if HL had enough opportunities to engage in meaningful HL experiences during their childhood (i.e. operationalized as more than one

Spanish-speaking parent, interactions with Spanish-speaking relatives or friends, early instruction), they should not have difficulties with relative clauses. Therefore, because of their early exposure to the HL, HL learners who had better quantity and quality of exposure to the HL are expected to outperform L2 learners in the comprehension of relative clauses. This is because relative clauses are frequent in the input, oral or written, and are not limited to formal registers. The advantage for HL learners should disappear as L2 learners become more proficient in the L2.

Regarding comprehension of passive clauses with the copula in the imperfect tense, several factors hinder acquisition of the verbal passive clause with the copula in the imperfect tense in HL and L2 acquisition: (1) the verbal passive is not common in oral communication; (2) there is a canonical construction for the verbal passive clause in the past with the copula in the preterite tense *fue* and it is known that L2 and HL learners' grammar includes this passive clause with the canonical preterite *fue*. This means that they know the syntax and morphology of verbal passive clauses; (3) another passive voice construction, the reflexive passive, also known as morphological passive or se-passive, is more frequent in Spanish;[16] (4) the imperfect tense is vulnerable in L2 and HL learners' grammar and learners have difficulties making form-to-meaning mappings with this tense; (5) mastering the semantic and pragmatic functions of the copula occurs after prolonged input even for monolingually raised children.

A pilot study of verbal passive clauses with the copula in the imperfect tense leading to this project showed that instructed monolingually raised Spanish native speakers, who had completed at least high school, showed no difficulty with comprehension, which means that their grammar allowed this interpretation. Given that the verbal passive is not common in the input and its use is developed as literacy develops and formal registers are integrated in the learners'

[16] There are other grammatical constructions that can be used in Spanish to downgrade the agent (Tolchinsky & Rosado, 2005)

grammar, no advantage is expected for HL, both HL and L2 learners are expected to have difficulties when first encountering a truncated verbal passive with *ser* in the imperfect tense. Difficulties are not expected with the adjectival passive because it is a simpler and more frequent construction not limited to any register or modality.

Regarding instruction, when HL learners enroll in high school or college HL courses to reacquaint themselves with the language they join L2 learners in the classroom. Studies have shown that formal instruction helps HL learners in the acquisition of grammatical constructions (Bowles & Montrul, 2008; Montrul & Bowles, 2010; Potowski et al., 2009). To explore how instruction in Spanish as an L2 or HL affects comprehension of these clauses this study looks at instruction in general. Instruction is operationalized as Spanish courses taken from pre-school to the time of testing. Relative clauses are more common in spoken language than verbal passive clauses in the imperfect tense. Spanish courses in general could predict comprehension of relative clauses, and adjectival passive clauses but not of verbal passive clauses. The verbal passive clause with the canonical past tense *fue* and the reflexive passive are the ones taught in classrooms, not the verbal passive clause with the copula in the imperfect tense *era*.

With respect to task modality, L2 and HL speaker's linguistic experience influences their abilities with language tasks because each experience emphasizes different language skills (Bowles, 2011b; Montrul, 2016). Methodological considerations regarding modality are relevant because L2 learners' meaningful exposure to the language is mainly with a textbook, reading and writing in the classroom, where opportunities for verbal interactions are limited. Learning the grammar in classroom settings helps them develop metalinguistic or explicit knowledge of the language. Consequently, they tend to perform well in tasks that target metalinguistic knowledge,

but performance in real time is a difficult process for them (R. Ellis, 2005). Heritage speakers also have limited meaningful exposure to the language, but their exposure is mostly aural in informal settings with family, relatives and their Spanish speaking community. They do not have significant experience writing or reading the heritage language, so typically they are not literate to different degrees in the heritage language and, therefore, many have poor metalinguistic knowledge of the language (Montrul, 2008b, 2016). Because their experience with the language is mostly aural, they tend to perform better in aural tasks that tap on implicit knowledge, or on intuitive information (Bowles, 2011a; Montrul et al., 2008a; Montrul & Perpiñán, 2011). Based on this typical language experience, L2 learners are expected to perform better in the written modality and HL learners, in the aural modality.

In sum, this study advances our understanding of age effects and quality and quantity of exposure in second and heritage language acquisition by investigating how L2 learners and heritage speakers of Spanish who have received varying degrees of Spanish instruction comprehend grammatical structures of later language development in aural and written modalities. Understanding the grammar of L2 and HL learners will inform us of what is linguistically attainable when acquiring a language early or late in life and the potential effects of varying degrees of quality, quantity and modality of input in different environments.

CHAPTER 5: METHOD

5.1 Participants

To answer these research questions one hundred sixteen (116) participants were recruited through email announcement and flyers at the participating institutions. Testing took place at the Second Language Acquisition and Bilingualism Lab (SLAB) in UIUC, in an office at Yale University and Southern Connecticut State University, at two Connecticut public libraries, and in an apartment in New York City. Participants in SLAB (N=84) completed tasks on a 19" screen desktop computer, off-UIUC participants (N=32) completed the tasks on a 17.3" laptop computer. All participants were remunerated per hour, and completion of all tasks and questionnaires took approximately one and a half hours to two hours.

A background questionnaire that asked questions about demographic information, language experience, family language background, and Spanish instruction (see Appendix A) was administered to all participants. Native speakers' mean age was 29.93 (SD = 6.28), their mean length of residence in the U.S. was 56.13 months (SD = 48.98), and it ranged from two weeks to sixteen years (192 months). Only two native speakers arrived in the US before age 18, one arrived at age 15, and was 19 at time of testing; the other one arrived at age 12, and was 28 at time of testing. One of the native speakers from Spain arrived in Spain at the age of 10 from Romania. This speaker was excluded from data analysis because she was a heritage speaker of Romanian.

HL speakers' mean age was 22.64 (SD = 6.02). Most HL speakers were born in the U.S., except for four, two were born outside the U.S. and came to the U.S. at the age of one, and at the age of six months. The other two were born outside the U.S., but one came to the US at the age of 8, and the other one at the age of 4, these last two participants were excluded from data

analysis. All heritage speakers started Kindergarten in the U.S., and 4 attended elementary schools with dual language programs (Spanish-English).

L2 speakers' mean age was 23.31 (SD = 5.33). Most L2 learners' first exposure to Spanish was in middle school or high school starting at the age of 11 (range 11 – 17). For eleven participants, however, first exposure to Spanish as a foreign language was in elementary school starting as early as Kindergarten. See summary in Table 3.

5.1.1 Proficiency

Because this study assessed comprehension in written and aural modality, proficiency in Spanish was determined with a written proficiency test and an oral picture-based narrative task. The written test was adapted from the *Diploma de Español como Lengua Extranjera (*'Diploma of Spanish as a Foreign Language' or DELE by its Spanish acronym) that consisted of 30 multiple-choice questions (testing vocabulary) and a 20-item cloze test (testing vocabulary, verbal conjugations, prepositions, and adjectives). This test has been used to test proficiency of Spanish as a heritage language in numerous studies (Montrul, 2016), see Appendix B. Oral proficiency was determined using an oral picture-based narrative. Participants watched a Power Point picture presentation of the story of Little Red Riding Hood and were asked to describe and narrate the pictures. Instructions were in Spanish and there was a total of 14 slides, see Appendix C. The oral narrative was transcribed and analyzed using the Systematic Analysis of Language Transcripts (SALT) software student version 16-7. Analysis consisted of calculating lexical diversity using moving average type/token ratio MATTR, MLU (in words), lexical fluency (words per minute) and errors. See Appendix D for details.

Once written and oral proficiency were calculated for each group, L2 learners who scored below 25 (out of 50) in the written proficiency test were excluded (N=18). Exclusion of these L2

learners was necessary for comparison purposes because 31 of the 32 HL speakers were within 26-50 proficiency range, and more importantly because beginner learners of Spanish would not be able to read complex sentences. After excluding participants who did not fulfill all criteria, 95 participants were included in data analysis: thirty (30) native speakers, thirty-two (32) L2 learners, and thirty-three (33) heritage speakers. See summary of participants' profile in Table 3.

Table 3 *Participants' profile*

	Native speakers N= 30	**HL learners** N=33	**L2 learners**[17] N= 32
Mean Age (SD)	29.93 (6.28)	22.64 (6.02).	23.31 (5.33)
Country*	Chile Colombia Cuba Dominica Republic Ecuador Mexico Peru Puerto Rico Spain	Argentina Colombia Cuba Dominican Republic Ecuador Guatemala Mexico Puerto Rico Spain Venezuela	
Length of Meaningful exposure to:			
Spanish	Since birth	Since Birth	In middle school mostly (for some as early as age 5)
English	2 weeks – 16 years	Since age 5 mostly (for some it started earlier at daycare)	Since Birth
Proficiency			
Written (50 max.)			
Mean Score (SD) Score Range	47.63 (1.99) 42-50	38.58 (6.82) 15-50	35.03 (8.20) 25-47
Oral Mean Scores (SD			
MATTR Score Range	0.56 (0.05) 0.46-0.66	0.52 (0.04) 0.44-0.59	0.50 (0.05) 0.39-0.59
MLU Score Range	10.43 (2.83) 6.00-16.55	9.16 (1.80) 5.93-13.09	9.95 (1.68) 7.16-14.25
Fluency (words/mins) Score Range	108.57 (23.42) 41.2 – 149.49	88.40 (23.84) 49.15 – 134.27	72.571 (21.88) 47.76 – 128.28

*For native speakers, 'country' refers to the country where they grew up, for HL speakers, it refers to the country where their parents come from.

[17] One of the L2 learners did not complete the oral narrative.

An One-Way ANOVA was conducted on each proficiency measure, with type of group as the independent variable and scores in each test as the dependent variable. Results varied per measure.

Analysis of the written proficiency measure (DELE) showed a main effect of group $F(2,92) = 32.405$, $p<0.001$. Post-hoc comparisons indicate that DELE scores of native speakers were significantly different from HL learners and L2 learners ($p<0.001$). The difference between HL and L2 learners scores was not significant, $p>0.05$.

Moving Average Type/Token Ratio (MATTR) scores analysis showed a main effect of group, $F(2,91) = 13.843$, $p<0.001$. Post-hoc comparisons indicated that native speakers MATTR scores were significantly different from that of HL and L2 learners, $p<0.01$, whereas that of HL and L2 learners did not differ significantly from each other($p>0.05$).

There was a main effect of group in the analysis the of MLU scores, $F(2,91) =3.619$, $p<0.05$. Post-hoc comparisons indicated that the difference between native speakers and L2 learners scores was not significant ($p>0.5$), and neither was the difference between HL and L2 learners' ($p>0.10$). HL learners MLU score was significantly lower than native speakers' MLU score ($p<0.05$).

Analysis on Fluency scores also showed a main effect of group, $F(2,91) =18.624$, $p<0.01$. Post-hoc comparisons indicated that Fluency scores for the all three groups differed significantly from each other ($p<0.05$), with native speakers being the most fluent, and L2 learners the least fluent.

5.1.2 Instruction

Spanish instruction was operationalized as number of courses completed in school and college. Note that Spanish courses at school are typically a full academic year, whereas colleges

courses are one semester. Thus, 1 year of Spanish at school will be counted as 2 courses. See Key for abbreviations used in Table 4 and Table 5. Mean Spanish instruction for L2 learners was 14.1 courses (SD=9.43) and mean Spanish instruction for HL learners was 8.17 courses (SD=7.95).

Key:

K - Kindergarten
m – months
MX- Mexico
SP-Spanish
Tran – Transition
Yr(s)- year(s)

Table 4 *HL learners' instruction: K-12th, college, graduate studies and study abroad*

HL Proficiency	Total SP Courses	K-4th	5th-8th	9th-12th	College	Graduate	Study abroad
15	6	1	1	4	0	0	0
26	4	0	0	2	2	0	0
28	1	0	0	0	1	0	0
32	7	Tran to SP	0	4	3	0	0
34	1	0	0	0	1	0	0
34	1	0	0	0	1	0	0
34	8	ESL 1 yr	2	5	1	0	0
35	4.5	0.5	2	2	0	0	0
36	3	0	0	3	0	0	Weekends in MX
36	7.5	0.5	0	5	2	0	0
37	3	0	0	1	2	0	0
37	8	1	0	4	3	0	0
38	22	12.5	2.5	3	4	0	0
38	8	0	3	3	2	0	2 m
39	4	0	0	0	4	0	0
39	19.5	12.5	3	3	1	0	0
39	2	0	0	1	1	0	0
40	6	0	0	3	3	0	0
40	11	0	2	4	4	1	24 m
40	7	ESL 3 yrs	3	4	0	0	1 m
41	1	1	0	0	0	0	0
41	30.5	12.5	10	3	5	0	0
41	4	0	0	4	0	0	0
43	2	0	0	0	2	0	0
43	6	0	0	4	2	0	15 m
43	11	1 yr-Spain	0	6	0	0	12 m
44	7	1	2	4	0	0	12 m
45	12	10	0	0	2	0	24 m
45	11	5	0	0	4	2	0
45	5	0	1	2	2	0	0
47	4	0	0	3	1	0	12 m (pre-K)
48	7.5	0.5	0	4	3	0	7 m
50	35	0	0	15	20	0	84 m

Table 5 *L2 learners' instruction: K-12th, college, graduate studies and study abroad*

L2 Proficiency	Total SP Courses	K-4th	5th-8th	9th-12th	College	Graduate	Study abroad
25	6	0	0	2	4	0	0
25	15	0	2	4	9	0	0
25	9	0	0	5	4	0	0
26	10	0	3	4	3	0	0
26	3	0	0	1	2	0	0
26	22	5	3	4	10	0	3 m
26	8.5	0.5	0	4	4	0	0
27	8	0	1	5	2	0	0
27	6	0	0	4	2	0	0
27	11	0	0	4	7	0	0
28	13	0	2	4	7	0	0
30	13	4	3	3	3	0	6 m
31	32.5	12.5	10	3	7	0	0
31	7	0	1	2	4	0	4.5 m
31	15	0	3	4	8	0	0
32	8	1	0	4	3	0	1.5 m
34	8	0	0	2	6	0	4 m
35	8	1	1	4	2	0	0.5 m
39	15	0	3	4	8	0	0
39	10	2	0	4	4	0	0
40	11	0	1	4	6	0	4 m
40	22.5	0	1.5	4	12	5	2 m
41	10	0	2	2	6	0	0
43	15	1	4	4	6	0	4 m
44	7.5	0.5	0	2	5	0	0
45	4	0	0	2	2	0	36 m
45	10	0	1	4	5	0	15 m
46	38.5	2	3	2.5	7	24	0
46	19	0	1	4	14	0	1.5 m
47	38.5	0	0	0.5	14	24	0
47	30	0	0	1	5	24	21.5 m
47	12	0	4	4	4	0	6 m

5.2 Procedure

All participants read and signed the consent form before testing began. They then reviewed the vocabulary used in the tasks and asked questions to clarify the meaning of words they were not familiar with. The vocabulary was presented in print. The researcher then proceeded to explain the tasks they were about to complete. Instructions were first given in Spanish, and when needed translated to English.

Participants completed 8 tasks. The first four tasks were administered in the following order:

1. Aural Picture Matching Task
2. Written Picture Matching Task
3. Aural Grammaticality Judgment Task
4. Written Grammaticality Judgment Task

The following tasks were administered in no specific order depending on laptop computer availability for the oral narrative:

5. Cloze test (online or print)
6. Bilingual Language Questionnaire (online or print)
7. Oral narrative (recorded in laptop computer)
8. Spanish instruction form (print)

After completion of all tasks participants received remuneration for their time.

5.3 Grammaticality Judgment Tasks (GJT)

The GJT was designed in the psycholinguistics E-Prime software 1.2 to test command of grammatical features that are necessary for comprehension of verbal passive clauses and object relative clauses in the PMT, namely, *ser* and *estar* in different contexts, inflectional morphology

for verbs in 3rd person plural and singular forms, and inversion in sentences. The goal of this task was to ensure that difficulties in the PMT were due to the structure being tested, not to unfamiliarity with these grammatical features.

Four lists were created. One list was used in the aural modality and the other in the written modality of the GJT, therefore all participants completed two scripts of the GJT. Each script consisted of 72 sentences from the following conditions: passive clauses with a displaced agent (6 grammatical and 6 ungrammatical— hereinafter 6G and 6U—), passive clauses with the canonical past tense *fue* (3G), copulas *ser* and *estar* in attributive sentences with unequivocal adjectives for *ser* (3G, 3U)) and *estar* (3G, 3U), and with unequivocal prepositional phrases for *ser* (3G, 3U) and *estar* (3G, 3U), and sentences in the present progressive (3G, 3U). Regarding grammar knowledge to understand the relative clauses, the items included questions with inversion (6G, 6U) and questions without inversion (6G, 6U). Find complete list in Appendix E. These sentences had 3rd person singular and plural verbs in the preterite tense. See examples (58) - (66), below. The number next to the sentence refers to the number of items included in one script. The letter 'G' refers to grammatical sentences and the letter 'U', to ungrammatical sentences.

(58) Passive clause displaced agent

a. *La cena era servida por los meseros*. 6 G
Dinner was(*ser*-IMPERFECT) served by the waiters.

b. **La cena estaba servida por los meseros*. 6 U
*Dinner was(*estar*-IMPERFECT) served by the waiters.

Evaluating passive clauses with a displaced agent will indicate whether speakers know that only passive sentences with *ser* accept a direct agent introduced by the preposition *por*. Verbal passive clauses with *ser* in the imperfect tense are not taught and are not frequent in the

input, thus testing verbal passive clauses with *fue*, the canonical past tense will indicate whether participants are familiar with the structure of verbal passive clauses.

(59) Passive clause with the canonical past tense *fue*

a. *La paciente fue examinada por el médico*. 3 G
The patient was(*ser*-PRETERITE) examined by the doctor.

Evaluating these correctly, but not the ones in the imperfect tense would mean that they know the structure but not the meaning implied by the use of the imperfect tense as shown in Bruhn de Garavito & Valenzuela (2008) and Valenzuela et al. (2015). If participants are not familiar with the canonical structure, they are not expected to be familiar with the verbal passive clause in the imperfect tense *era*.

According to Geeslin and Guijarro-Fuentes (2006) simple sentences in imperfect past tense with unequivocal adjectival predicates for each copula are the hardest to acquire because of the meaning change that each copula entails with each adjective, see (60) and (61). A question that this thesis will seek to answer is whether L2 learners who have acquired these distinct uses of the copula are also accurate in the comprehension of verbal passive clauses in the imperfect tense.

(60) *Ser* + unequivocal adjective

a. *El científico era importante*. 3 G
The scientist was(*ser*-IMPERFECT) important.

b. **El científico estaba importante*. 3 U
*The scientist was(*estar*-IMPERFECT) important.

(61) *Estar* + unequivocal adjective

a. *La madre estaba cansada*. 3 G
The mother was(*estar*-IMPERFECT) tired.

b. **La madre era cansada*. 3 U
*The mother was(*ser*-IMPERFECT) tired

HL learners have extended the distribution of *estar* with predicate adjectives, but they have not lost the semantic distinction between the copulas (Silva-Corvalán, 1994, 2014). The GJT will confirm that this is the case of learners completing the tasks. Learners who do not understand the distinction between the copulas will not be included in the analysis of the PMT, the comprehension task.

The data available for simple sentences in the present tense with unequivocal prepositional phrases for each copula, see (62) and (63), indicates that sentences with *ser* are acquired early by L2 learners. Sentences with *estar* are acquired later (Geeslin, 2003).

(62) *Ser* + prepositional phrase

a. *La torre era de piedra*. 3 G
The tower was(*ser*-IMPERFECT) of stone.
'The tower was made out of stone'.

b. **La torre estaba de piedra*. 3 U
*The tower was(*estar*-IMPERFECT) of stone.

(63) *Estar* + prepositional phrase

a. *Los hombres estaban en el trabajo*. 3 G
The men were(*estar*-IMPERFECT) at work.

b. **Los hombres eran en el trabajo*. 3 U
*The men were(*ser*-IMPERFECT) at work.

Participants are expected to correctly evaluate these sentences as it will show basic knowledge of the imperfect tense and of copula use in Spanish. Even though HL learners have extended the distribution of use of the copula *estar*, Silva-Corvalán (2014, p. 251) showed that the two bilingual children did not make mistakes in the selection of copula and its corresponding prepositional phrases. Thus, generalizing from Silva-Corvalán's findings, if HL learners have not

suffered attrition of the use of both Spanish copulas with prepositional phrases, then HL learners are expected to be accurate in the comprehension of these sentences.

All participants are expected to be highly accurate with simple sentences with *estar* as an auxiliary in the present progressive, see (64), since it is a relatively frequent construction in Spanish and L2 learners have been shown to acquire this structure after at least two years of Spanish instructions and HL learners by age 5 still show robust knowledge of it (Geeslin, 2013; Silva-Corvalán, 2014).

(64) *Estar* + present progressive

a. *El avión estaba aterrizando*. 3 G
The plane was$_{(estar\text{-IMPERFECT})}$ landing.

b. **El avión era aterrizando*. 3 U
The plane was$_{(estar\text{-IMPERFECT})}$ landing.

The relative clauses tested in this study used verbal morphology as a cue to word order. Knowledge of inflectional morphology for 3rd person singular and plural verbs in the preterite tense is crucial for correct comprehension of the subject and object relative clauses used in this study. L2 learners and HL learners at intermediate or higher proficiency are expected to show knowledge of this verbal inflectional morphology (Foote, 2011; Montrul, 2009). Regarding knowledge of inversion, this task will test whether L2 and HL learners are familiar with, and accept, inversion in Spanish.

(65) Questions with inversion

a. *¿Hundió los barcos el submarino?* 3 G
Sank$_{SG\text{-preterite}}$ the boats the submarine?
'The submarine sank the boats?

b. *¿Hundieron los barcos el submarino?* 3G
Sank$_{PL\text{-preterite}}$ the boats the submarine?
'The boats sank the submarine?'

c. *¿*Aplastó los pianos los sofás*? 3U
*Smashed$_{SG\text{-}preterite}$ the pianos the sofas?

d. *¿*Aplastaron el sofa el piano*? 3U
*Smashed$_{PL\text{-}preterite}$ the piano the sofa?

(66) Inflectional morphology for 3rd person singular and plural verbs

a. *La camioneta remolcó los coches*. 3G
The truck towed$_{SG\text{-}preterite}$ the cars?

b. *Los coches remolcaron la camioneta*. 3G
The cars towed$_{PL\text{-}preterite}$ the truck?

c. **Los pianos aplastó los sofás*. 3U
*The pianos smashed$_{SG\text{-}preterite}$ the sofas?

d. **El piano aplastaron el sofá*. 3U
*The piano smashed$_{PL\text{-}preterite}$ the sofa?

The GJT has been considered a problematic tool in the evaluation of L2 and HL grammar knowledge due to these speakers' tendency to accept ungrammatical sentences (Polinsky, 2016). This particular caveat will be of interest in showing whether modality affects judgment of these sentences. With results evaluated cautiously, this task is a screening tool to confirm that participants' performance in the picture matching task is a true measure of their grammar knowledge of the verbal passive clauses and object relative clauses.

In the aural modality of the task participants heard the grammatical and ungrammatical sentences on headphones. The sentence was repeated twice with a 3 second pause between the two sentences. Sentences were recorded by a native speaker from Mexico and a native speaker from Puerto Rico. Grammatical and ungrammatical sentences were controlled for prosodic cues that could lead the participant to choose a given answer by maintaining sentential stress on the first verb or noun of the sentence. Sentences in the written modality were presented in font size 14, white letters against a black background. Participants had 13 seconds to read the written

sentences.[18] Once participants read or heard the sentences, they could press any key to see the answer screen. They had 10 seconds to choose an answer.

The answer screen showed the next two phrases in Spanish: *No tiene errores – pulsa la tecla A* 'It does not have errors – press the key A'; *Tiene errores – pulsa la Tecla F* 'It has errors – press the key F'. They had to press the keyboard key labeled 'A', for grammatical sentences, and 'F', for ungrammatical sentences. The choices 'A' and 'F' were explained to the participants as a grade system: choose 'A' if the sentence is grammatical, meaning that it does not have any errors; and if it has an error, 'fail' the sentence by giving it an 'F'. Based on an American keyboard, the labels 'A' and 'F' were placed on the letters 'A' and 'L' to reduce potential confusion given that the keys 'A' and 'F' are close to each other on the keyboard.

Each GJT script in the aural or written modality consisted of four (4) practice items—two grammatical and two ungrammatical sentences—and seventy-two (72) grammatical and ungrammatical sentences from the nine (9) conditions listed above. After completing the task in the two modalities participants had evaluated a total of one hundred forty-four (144) sentences. Accuracy was recorded for all sentences. Correct answers were assigned a score of one (1), and incorrect answers a score of zero (0). An average of all answers was calculated. A mean score closer to one (1) indicated better accuracy in the judgment of these structures, and a mean score closer to zero (0) indicated poorer judgment of these structures. Participants who scored above chance (~60% accuracy) in at least the grammatical sentences were considered to have the necessary knowledge to comprehend verbal and passive clauses in the PMT.

[18] 13 seconds is the length of the longest sentence in the aural version of the GJT.

5.4 Picture Matching Task (PMT)

The picture matching task (PMT) was designed in the psycholinguistics E-Prime software 1.2 to test comprehension of verbal passive clauses and object relative clauses. The main goal of this task was for participants to hear or read a sentence and then pick a picture depicting what they just heard or read, in this way they showed how they interpreted adjectival and verbal passive clauses with the copula in the imperfect tense, and subject and object relative clauses with and without VO and SV inversion, respectively.

5.4.1 Norming

The two main components of the PMT are the drawings and the sentences. Before creating the PMT, all drawings and sentences had to be normed. The drawings had to be normed to ensure accurate depiction of the sentences. Each sentence and drawing are based on a context. For instance, to depict the following passive clauses 'The car was vandalized' and 'The car was being vandalized' two drawings were needed, one depicting each action. Once these drawings were completed a third party evaluated that the drawings actually depicted what the sentences were saying. There were 27 contexts for passive clauses and 28 for relative clauses. Drawings for all contexts were evaluated by three undergraduate students for clarity. The students were asked to explain the drawings, and to mark drawings that they could not explain. Per their evaluation confusing contexts were excluded. Other drawings were modified for clarity based on the feedback received.

Sentences for this task were created in a specific way to answer the research questions. Thus, specific contexts were created for this purpose. These contexts had to be familiar and plausible in real life to avoid implausibility affecting participants' interpretation of the sentences. As you will read in detail below, plausibility of the context affects comprehension of relative and

passive clauses, therefore, all experimental contexts were normed with native speakers to make sure that plausibility of the context did not affect selection of the drawings.

Norming of the sentences was conducted with a survey created in Surveygizmo. Twenty-six (26) contexts for relative clauses and twenty-five (25) contexts for passive clauses were evaluated by nineteen (19) Spanish native speakers from Puerto Rico (N=15), Mexico (N=2), Perú (N=1) and by one (1) near-native Spanish L2 learner from Brazil. Seven (7) of these participants lived in the U.S. at the time of testing. These nineteen (19) participants completed the Surveygizmo task only, they did not complete any of the other tasks.

The norming study elicited 'plausibility ratings' of verbal passive clauses with displaced agents (e.g. *El paciente era medicado por los médicos.* 'The patient was medicated by the doctor.), and plausibility ratings of basic declarative sentences using the two nouns phrases and the verb used in the relative clauses. For instance, if a relative clause contained the NPs 'book' and 'magazines' with the verb 'to cover', two sentences were judged for plausibility: *El libro cubrió las revistas* 'the book covered the magazines' and *Las revistas cubrieron el libro* 'The magazines covered the book'. Instructions in the norming study and all sentences were presented in Spanish only. No translation was provided. See extract of Surveygizmo test in Table 6. See complete test in Appendix F.

Table 6 *Norming in Surveygizmo – Extract of instructions and sample items*

Please indicate whether the following sentences are possible/probable or not. If you think that they are not possible/probable please briefly explain why

(1) Las revistas cubrieron el libro. 'The magazines covered the book'

( ) Es probable 'It is probable'

( ) No es probable ''It is not probable'

Comments:

(2) El libro cubrió las revistas. 'The book covered the magazines'

( ) Es probable 'It is probable'

( ) No es probable ''It is not probable'Comments:

(3) El paciente era medicado por los médicos. 'The patient was medicated by the doctor.'

( ) Es probable 'It is probable'

( ) No es probable ''It is not probable'

Comments:

Fillers:

(4) El caracol destruyó la Piedra. 'The seashell destroyed the rock.'

( ) Es probable 'It is probable'

( ) No es probable ''It is not probable'

Comments:

(5) Las plumas abollaron el carro. ' The feathers dented the car.'

( ) Es probable 'It is probable'

( ) No es probable ''It is not probable'

Comments:

After norming was completed, two contexts from the relatives and one context from the passives were considered least plausible and were excluded. 24 contexts for verbal passive clauses and 24 contexts for relative clauses were included in the PMT.

5.4.2 Passive Clauses

The verbal passive clause with the copula in the imperfect tense refers to an ongoing action, whereas the adjectival passive clause in the imperfect tense refers to a finished action, a description of a state. See (67). By showing participants two pictures, one depicting an ongoing action, and one depicting a finished action described with the same past participle, this task could inform us on whether the learners understood what each sentence meant based on the copula used.

(67) Passive Clauses

Adjectival/ Stative Passive
El carro estaba vandalizado
The car was (estar.IMPERFECT) vandalized.
"The car was vandalized."

Verbal/Eventive Passive
El carro era vandalizado.
The car was (ser.IMPERFECT) vandalized.
"The car was being vandalized."

24 verbal passive clauses context were created as minimal pairs with 24 adjectival passive clauses so that the only difference between them was the copula. See (68) and (69) below. Therefore, there were two conditions for the passive clauses, the adjectival passive and the verbal passive.

(68) La comida estaba servida. *Adjectival/ Stative Passive*
Dinner was (estar.IMPERFECT) served.
"Dinner was served."

(69) La comida era servida. *Verbal/Eventive Passive*
Dinner was $_{(ser.IMPERFECT)}$ served.
"Dinner was being served."

Because one of goals of the present study is to investigate knowledge of the semantics of *ser* and *estar* in a passive clause, only truncated passives were used in the experimental clauses: not using the agent avoided leading the participants to a particular interpretation. To avoid as many confounds as possible only actional verbs were used because these are the verbs that are first understood in L1 acquisition and development of passive clauses (Sudhalter & Braine, 1985). Irreversibility of verbal passive clauses (whether the agent or the theme could perform the action expressed by the verb) is known to be problematic at early stages of L1 acquisition, thus only irreversible contexts were included in this task. Of the 24 contexts 23 used regular participles *(-ado, -ada, -ido,-ida*), only one context uses an irregular participle (i.e. *escrito* 'written'). The two drawings for the passive clauses depicted a finished action and an ongoing action.

Although in principle all transitive verbs could be used in the passive voice, only transitive verbs that worked well with both copulas were used. This means that verbs that are lexicalized with either one of the copulas were not used. For instance, in (70) a verb like *tumbar* works with *ser*, but the minimal pair with *estar* is lexicalized with the verb *tumbar* with the meaning 'to be lying down'. This lexicalization makes the sentence with *ser* seem even more odd than it normally would be due to its exclusivity to the formal written register.

(70) *El hombre era tumbado*.
The man was$_{(ser.IMPERFECTO)}$ knocked down.
"The man was knocked down."

(71) El hombre estaba tumbado.
The man was$_{(estar.IMPERFECTO)}$ knocked down.
"The man was lying down."

Similarly, the study of relative clauses focused on whether the L2 and HL learners comprehended the Noun Phrase-Verb (NP-V) or Verb-Noun Phrase (V-NP) order possible in the embedded clauses in Spanish. Subject relative clauses can have a word order with Verb-Object (V-NP) or with Verb-Object inversion (NP-V) in the embedded clause. Object relatives can have a word order with Subject-Verb (NP-V) or Subject-Verb inversion (V-NP). For instance, if inflectional morphology of the object relative clauses with VS order is not processed correctly, see (72), then this clause could be misinterpreted as a subject relative clause, see (73), which is exactly what low proficiency L2 learners did in Sánchez-Walker & Montrul (2016).

(72) Object relative with VS order
Este es el libro que cubrieron(VERB-PL) *las revistas*(SUBJECT-PL).
This is the book that covered(VERB-PL) the magazines(SUBJECT-PL).
'This is the book that the magazines covered'

Correct

Incorrect

(73) Subject relative with VO order
Este es el libro que cubrió(VERB-SG) *las revistas*(OBJECT-PL).
'This is the book that covered the magazines.'

Incorrect

Correct

This distribution yielded four separate conditions: subject relative clause without NP-V inversion, subject relative clause with NP-V inversion, object relative clauses without NP-V inversion, and object relative clauses with NP-V inversion. The only difference between subject relative clauses and object relative clauses, besides their word order, is the inflectional morphology marking subject-verb agreement, which clearly indicates which NP is the subject and which NP is the object. See Table 7.

Table 7 *Relative Clauses in Latin Square distribution*

	Subject Relative clauses	Object Relative clauses
Without NP-V inversion	*el libro que cubrió*$_{SG}$ *las revistas* the book that covered$_{SG}$ the magazines	*el libro que cubrieron*$_{PL}$ *las revistas* the book that covered$_{PL}$ the magazines 'the book that the magazines covered'
With NP-V inversion	*el libro que las revistas cubrió*$_{SG}$ The book that the magazines covered$_{SG}$ 'The book that covered the magazines'	*el libro que las revistas cubrieron*$_{PL}$ the book that the magazines covered$_{PL}$

24 contexts were used in the PMT for the relative clauses. Find complete list of contexts and drawings in Appendix G. Because animacy of the NPs and plausibility of the context affect comprehension of relative clauses, all experimental relative clauses in this study were created as reversible plausible contexts in which either NP could perform the action expressed by the verb. See example in Table 7. In addition, the NPs used in this study were inanimate and did not need Direct Object Marking (i.e. preposition 'a'), a phenomenon that causes significant difficulty to L2 and HL learners of Spanish whose first or dominant language is English (Bowles & Montrul, 2009; Guijarro-Fuentes, 2011; Montrul & Bowles, 2010; Montrul & Sánchez-Walker, 2013), because this preposition could be used as a cue to identifying the object.[19]

[19] Montrul & Bowles (2009) have indicated that an inanimate object could be preceded by DOM if the subject is also inanimate. However, it is not strange to have an inanimate singular subject and an inanimate plural object without DOM, or an inanimate plural subject and an inanimate singular object without DOM. This makes sense because there is no ambiguity when the nouns differ in number.

5.4.3 Sentence Lists and token sets

Relative clauses had four conditions for each of the twenty-four contexts and passive clauses had two conditions for each of the twenty-four contexts. Thus, there were 24 items for each condition, see Table 8.

Table 8 *Conditions and Items per condition*

Condition		**Items**
Subject relative clause without NP-V inversion	($SR_{NP\text{-}V}$)	24
Object relative clause without NP-V inversion	($OR_{NP\text{-}V}$)	24
Subject relative clause with NP-V inversion	($SR_{V\text{-}NP}$)	24
Object relative clause with NP-V inversion	($OR_{V\text{-}NP}$)	24
Verbal Passive	(PAS)	24
Adjectival Passive	(PASE)	24

These items were pseudorandomized in four lists for each participant to see two conditions of the same context of relative clauses (one in the aural modality, and one in the written modality), and one condition of each passive clause context in either the aural or the written modality. See Table 9. Participants saw List 1 and List 2, or List 3 and 4; one list in the aural modality, and the other list in the written modality.

Table 9 *Item distribution by context number*

List 1		List 2		List 3		List 4	
$SR_{NP\text{-}V}$	1-6	$SR_{NP\text{-}V}$	7-12	$SR_{NP\text{-}V}$	13-18	$SR_{NP\text{-}V}$	19-24
$OR_{NP\text{-}V}$	19-24	$OR_{NP\text{-}V}$	1-6	$OR_{NP\text{-}V}$	7-12	$OR_{NP\text{-}V}$	13-18
$SR_{V\text{-}NP}$	13-18	$SR_{V\text{-}NP}$	19-24	$SR_{V\text{-}NP}$	1-6	$SR_{V\text{-}NP}$	7-12
$OR_{V\text{-}NP}$	7-12	$OR_{V\text{-}NP}$	13-18	$OR_{V\text{-}NP}$	19-24	$OR_{V\text{-}NP}$	1-6
PAS	1-6	PAS	13-18	PAS	7-12	PAS	19-24
PASE	7-12	PASE	19-24	PASE	13-18	PASE	1-6

Each group of learners (HL, L2, NS) saw the lists in the following order successively:

Table 10 *Order of presentation of lists*

Subject	Aural modality	Written modality
Participant 1	List 1	List 2
Participant 2	List 3	List 4
Participant 3	List 2	List 1
Participant 4	List 4	List 3

Besides the 36 experimental conditions shown on Table 9, each list included 4 practice items and 32 fillers, for a total of 68 pseudorandomized items. After completing the task in the two modalities, participants had evaluated a total of 136 sentences. All participants evaluated all conditions tested.

The 32 fillers were 12 simple sentences in the active voice, 3 simple sentences with *estar*, 3 simple sentences with *ser,* 6 passive clauses with *fue*, and 8 items of relative clauses with plausible, non-reversible contexts (e.g. *Ésta es la estrella que ven con el telescopio.*'This is the star they see$_{PL}$ with the telescope'.). Relative clauses were embedded in a sentence starting with *Ésta es* or *Éste es* "this is" (e.g. Éste es el submarino que hundió los barcos 'This is the submarine$_{sg}$ that sank$_{sg}$ the boats.'). See summary and examples in Table 11.

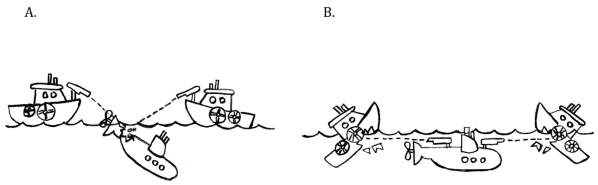
Table 11 *PMT sentences*

6 subject relative clauses (VO)	*Éste es el libro que cubrió las revistas.* This is the book that covered$_{SG}$ the magazines. 'This is the book that covered the magazines'
6 subject relative clauses (OV)	*Éste es el libro que las revistas cubrió.* This is the book that the magazines covered$_{SG}$. 'This is the book that covered the magazines'
6 object relative clauses (SV)	*Éste es el libro que las revistas cubrieron.* This is the book that the magazines covered$_{PL}$. 'This is the book that the magazines covered'
6 object relative clauses (VS)	*Éste es el libro que cubrieron las revistas.* This is the book that covered$_{PL}$ the magazines. 'This is the book that the magazines covered'
6 verbal passive clauses	*La cena era servida.* Dinner was $_{(ser.IMPERFECT)}$ served. 'Dinner was being served.'
6 adjectival passive clauses	*La cena estaba servida.* Dinner was $_{(estar.IMPERFECT)}$ served. 'Dinner was served.'
12 simple sentences in the active voice	*La madre servía la cena.* The mother served$_{(ser.IMPERFECT)}$ the food. 'The mother served the food.'
3 simple sentences with estar	*Los libros estaban en el mostrador.* The books were$_{(ser.IMPERFECT)}$ on the counter. 'The books were on the counter.'
3 simple sentences with ser	*Era un libro.* It was$_{(ser.IMPERFECT)}$ a book. 'It was a book.'
6 passive clauses with *fue*	*La mujer fue asesinada por el criminal.* The woman was$_{(ser.PRETERITE)}$ murdered$_{(past participle.FEMENINE)}$ by the criminal. 'The woman was murdered by the criminal'
8 Fillers	*Este es el coche que chocó la bicicleta.* 'This is the car that crashed into the bicycle.'

5.4.4 PMT Procedure

In the aural modality of the task participants heard the sentences on headphones. The sentence was repeated twice. There was a pause of three seconds between the two sentences. Sentences were recorded by the same native speakers from Mexico and from Puerto Rico who recorded sentences for the GJT. Sentences were controlled for prosodic cues that could lead the participant to choose a given answer by maintaining sentential stress on the first verb in the case of relative clauses, or the first noun of the sentence in the case of passive clauses. Sentences in the written modality were presented in font size 14, white letters against a black background. Participants had 11 seconds to read the written sentences.[20] Once participants read or heard the sentences, they could press any key to see the answer screen. The answer screen showed two 8" x 5.5" drawings next to each other labeled A and B. See (74)

(74) PMT Drawings



Participants had to choose from these two drawings displayed on the screen, the one that matched the sentence they heard on the headphones or that they read on the screen. They had a maximum of 10 seconds to choose an answer. They had to press the keyboard key labeled A or B, accordingly. Based on an U.S. keyboard layout, the labels A and B was placed on the letters A and L to reduce potential confusion given that the keys A and B are close to each other on the keyboard.

[20] 11 seconds is the length of the longest sentence in the aural version of the PMT.

Participants had to listen to or read sentences and choose the drawing depicting what they just heard. While they had to know certain rules of grammar to correctly interpret these sentences, the timed PMT required focus on the meaning of these sentences. In this manner this task minimized learners' access to metalinguistic knowledge.

Accuracy was recorded for all experimental and filler sentences. Correct answers were assigned a score of 1, and incorrect answers a score of 0. An average of all answers was calculated. A mean score closer to 1 indicated better comprehension of these structures, and a mean score closer to 0 indicated poor comprehension of these structures.

CHAPTER 6: RESULTS

This study investigated whether age of meaningful of exposure to Spanish affects HL and L2 learners' comprehension of relative clauses and passive clauses in Spanish. In addition, this study investigated whether task modality affect HL and L2 learner' comprehension of passive and relative clauses and whether instruction in Spanish affect HL and L2 learner' comprehension of passive and relative clauses.

Results of the Grammaticality Judgment Task (GJT) and Picture Matching Task (PMT)will be presented first for passive clauses and then for relative clauses. Accuracy in both tasks was recorded. Correct answers were assigned a score of one (1), and incorrect answers a score of zero (0). These data were analyzed with StatPlus and with a mixed effects logistic regression using the 'glmer' command from the 'lme4'package (Bates, Maechler, Bolker, & Walker, 2015) in R (R-Core-Team, 2019). All participants entered an answer for each item in the PMT and the GJT tasks, therefore all answers were included in the analysis. *P*-values less than 0.05 were considered significant.

6.1 Passive Clauses

6.1.1 Grammaticality Judgment Tasks (GJT)

To make sure that difficulties in the Picture Matching Task with the verbal passive clauses in the imperfect tense were due to the syntactic structure and the copula in the imperfect tense, grammar knowledge of the copula in the imperfect tense and in the following contexts was assessed with a Grammaticality Judgment Task: *Ser* + prepositional phrase, *Estar* + prepositional phrase, *Ser* + unequivocal adjective, *Estar* + unequivocal adjective, *Estar* + present progressive.

Simple sentences with the copula in the present tense followed by unequivocal prepositional phrases for each copula are acquired differently by L2 learners, *ser* + prepositional

phrases are learned earlier than those with *estar* (Geeslin, 2003). Other contexts, such as simple sentences with unequivocal adjectival predicates for each copula are harder to acquire because of the meaning change that each copula entails with each adjective (Geeslin & Guijarro-Fuentes, 2006). Simple sentences with *estar* as an auxiliary in the present progressive are a relatively frequent construction in Spanish, and L2 learners have been shown to acquire it after at least two years of Spanish instructions and HL learners by age 5 still show robust knowledge of it (Geeslin, 2013; Silva-Corvalán, 2014). As expected, learners were less accurate with copula + unequivocal adjective.

In general, mean accuracy scores for grammatical sentences for L2 learners was 0.97 (SD=0.05) and for HL learners, 0.97 (SD=0.06). Thus, both groups were accurate with copulas' grammatical sentences. L2 learners' mean accuracy score for each participant ranged from 0.8 to 1.0, median 0.97. And HL learners' mean accuracy score for each participant ranged from 0.73 to 1.0, median 0.97. For copula's ungrammatical sentences, L2 learners' mean accuracy score was 0.73 (SD=0.31), mean scores for each participant ranged from 0.0 to 1.0, median 0.73. Ten participants' mean score were below 0.60. HL learners' mean accuracy score for ungrammatical sentences was 0.83 (SD=0.16). Mean scores for each participant ranged from 0.17 to 1.00, median 0.83. One participant scored below 0.60. Lower mean scores for ungrammatical sentences was expected because of the learners' tendency to accept ungrammatical sentences (Polinsky, 2016). See Figure 2.

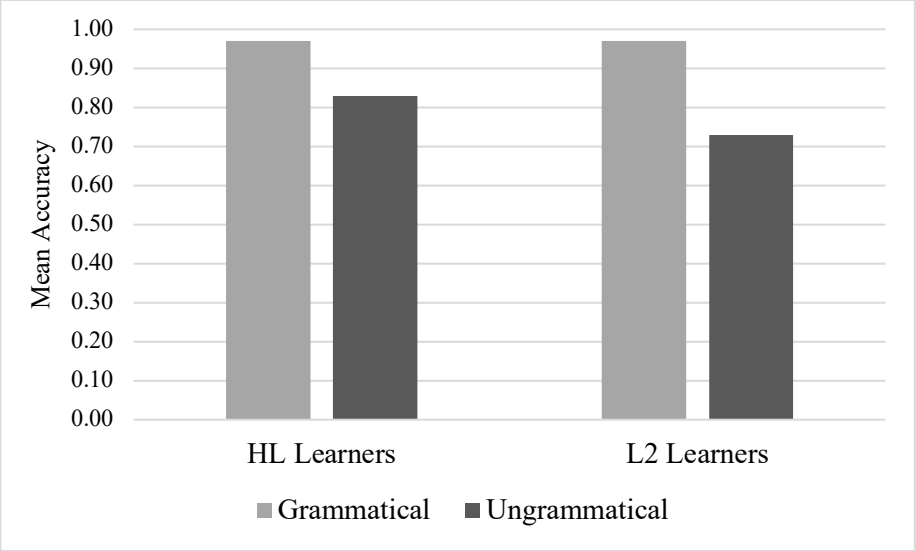


Figure 2. GJT: Mean accuracy on knowledge of copulas

Verbal passive clause with *fue* versus verbal passive clause with *era*

The GJT also investigated how these speakers evaluated verbal passive clauses with the canonical past tense *fue* and with the copula in the imperfect tense, based on Bruhn de Garavito & Valenzuela (2008) and Valenzuela et al. (2015) which show that L2 learners and HL speakers find the verbal passive clause in the canonical past tense more acceptable than the verbal passive clause with the copula in the imperfect tense. See Figure 3. A one-way independent ANOVA analyzed accuracy scores for the verbal passive clause in the imperfect tense by group. There was a significant effect of group $F(2,92) = 6.019$, $p<0.01$, and post-hoc comparisons indicated that HL and L2 learners did not differ significantly from each other ($p>0.05$). The main effect was due to native speakers being more accurate than both groups of learners. Means for the grammaticality of verbal passive clauses with *Fue* were analyzed with a one-way ANOVA by group (NS, HLL and L2L), and it showed that their mean accuracy score did not differ significantly $F(2,92)=2.74$, $p>0.05$.

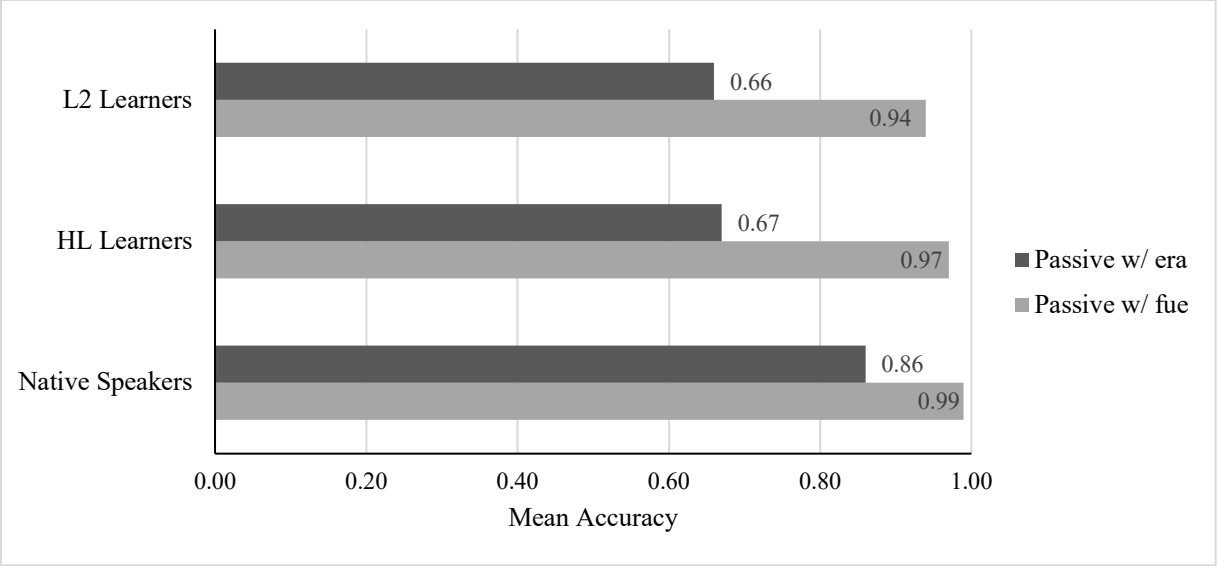


Figure 3. GJT: mean accuracy on passive clauses with *fue* vs with *era* by group

All participants accurately evaluated the verbal passive clause in the canonical past tense *fue* as grammatical, but had difficulty accepting the grammaticality of verbal passive clauses with the copula in the imperfect tense *era*.

HL and L2 learners' mean accuracy scores for the passive clause with the imperfect tense *estaba*, were below fifty percent. Because native speakers' mean accuracy scores for this sentence were also low, HL and L2 learners' low mean scores was taken to indicate that there is general confusion with this structure, most likely explained by the fact that in various contexts the passive clause with *estaba* accepts the displaced agent (García-Pardo, 2017).

In sum, results of the GJT show that most participants have basic knowledge of the copulas in the imperfect tense in different simple contexts, but not all. For this dissertation all participants were included in analysis, but the fact that 10 L2 learners and 1 HL scored below chance (0.50) indicates that they might not have clear knowledge of the copulas.

The next section presents the PMT results, which will inform us on whether these groups understand the verbal passive clause in the imperfect tense.

6.1.2 Picture Matching Task (PMT) – Passive Clauses

Mean accuracy scores for the adjectival passive clauses were 0.97 (SD=0.05) for native speakers, 0.92 (SD=0.15) for HL learners and 0.80 (SD=0.24) for L2 learners. Mean accuracy scores for the verbal passive clauses in the imperfect tense were 0.90 (SD=0.11) for native speakers, 0.38 (SD=0.31) for HL learners and 0.20 (SD=0.22) for L2 learners, see Figure 4.

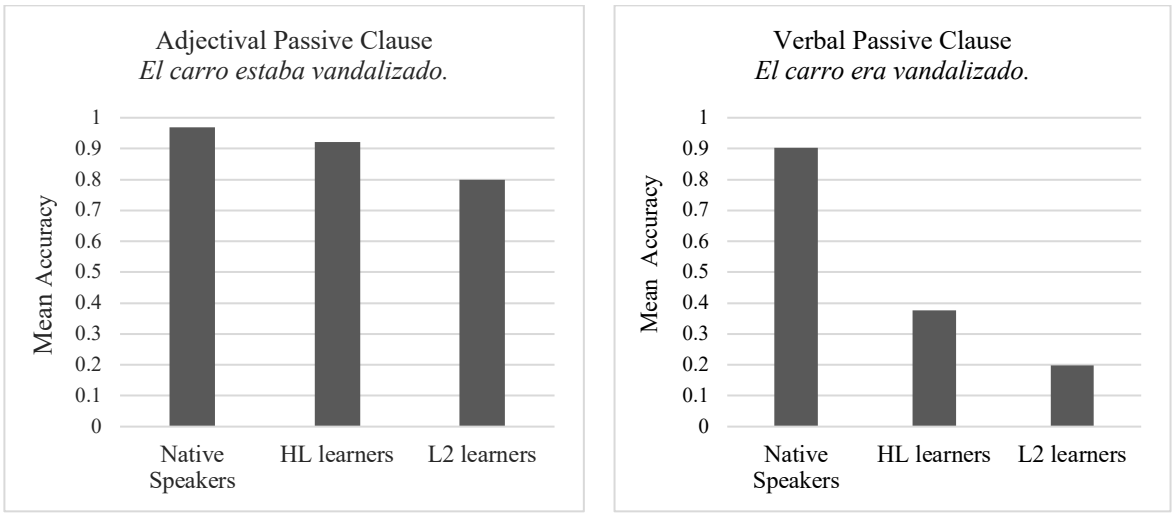


Figure 4. PMT: Mean accuracy scores of adjectival and verbal passive clauses

These data were analyzed with mixed effects logistic regression using the 'glmer' command from the 'lme4'package (Bates et al., 2015) in R (R-Core-Team, 2019). Maximal mixed-effects models included crossed random effects for subjects and items when convergence was possible, following Barr, Levy, Scheepers, & Tily (2013). Only experimental groups were included in the analyses: L2 learners and HL learners. A fixed effect was considered significant if the *p* value was lower than 0.05.

The Linear Mixed Model (LMM) included the dependent variable, accuracy, (binary outcome 1 or 0), analyzed as a function of Type of Passive Clause (cond) and Group (HL

learners vs. L2 learners) as fixed effects, with random intercepts for subjects and items, and by subject and by items random slopes for condition. LMM for HL and L2 learners' comprehension of passive clauses:

Generalized LMM fit by maximum likelihood (Laplace Approximation) ['glmerMod']
Family: binomial (logit)
Formula: acc ~ cond + group + (1+ cond | subject) + (1 + cond | item)

The odds of accurate answers for adjectival passives (estimate = 4.268, *SE* = 0.465, *z* = 9.210, $p < 0.001$) are $e^{4.2826} \approx 72.43$ times higher than the odds for verbal passives. And the odds of L2 learners (estimate = 1.3979, *SE* = 0.3457, *z* = -4.044, $p < 0.001$) being accurate with these clauses are $e^{-1.3979} \approx 4.05$ times lower than HL learners'. The main effects of Group and Type of Passive Clause were highly significant. See Table 12. The model did not converge when interaction between Group and Type of Passive Clause was included.

Table 12 *L2 and HL learners' output from mixed-effects model: passive clauses*

					Random Effects	
		Fixed Effects			By Subject	By Items
Parameters	Estimate	*SE*	*z*	*p value*	*SD*	*SD*
Intercept	-0.7086	0.3074	-2.305	< 0.05	1.6997	0.4799
Adjectival Passive	4.2826	0.4650	9.210	< 0.001	2.7130	0.2242
Group L2	-1.3979	0.3457	-4.044	< 0.001	-	-

This study sought to find out whether instruction and modality of task affected comprehension of these clauses. For this purpose, data for each group was analyzed with Instruction and Modality as factors.

L2 Learners

L2 learners' mean accuracy score for passive clauses in the written modality was 0.48 (SD=0.16) and in the aural modality it was 0.51 (SD=0.16). See Figure 5.

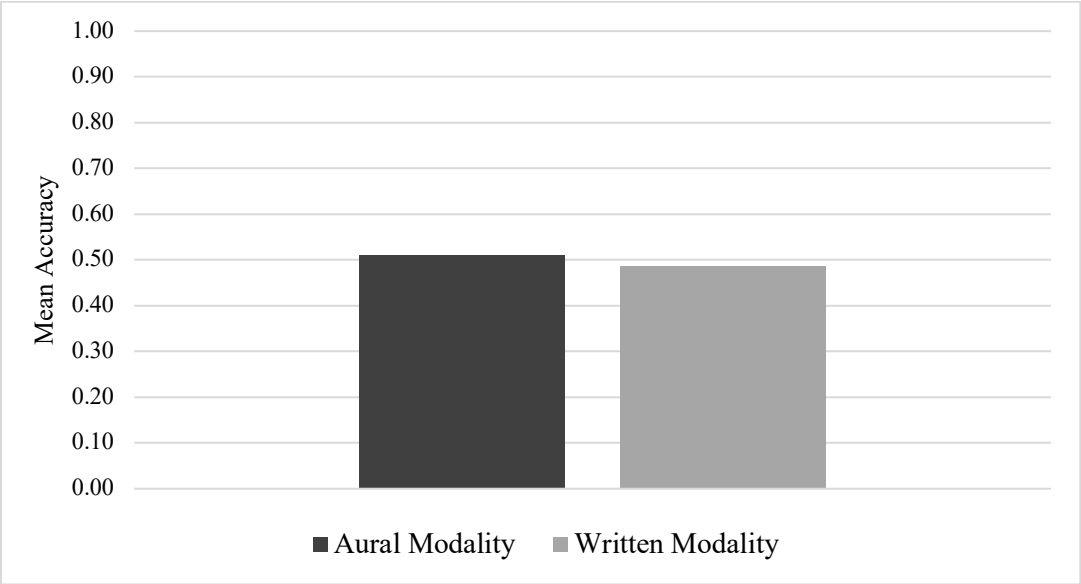


Figure 5. L2 learners' Comprehension of Passive Clauses by Modality

L2 learners' numbers of Spanish courses completed at time of testing was in average 14.1 (SD= 9.43). See instruction completed per L2 learner in Figure 6.

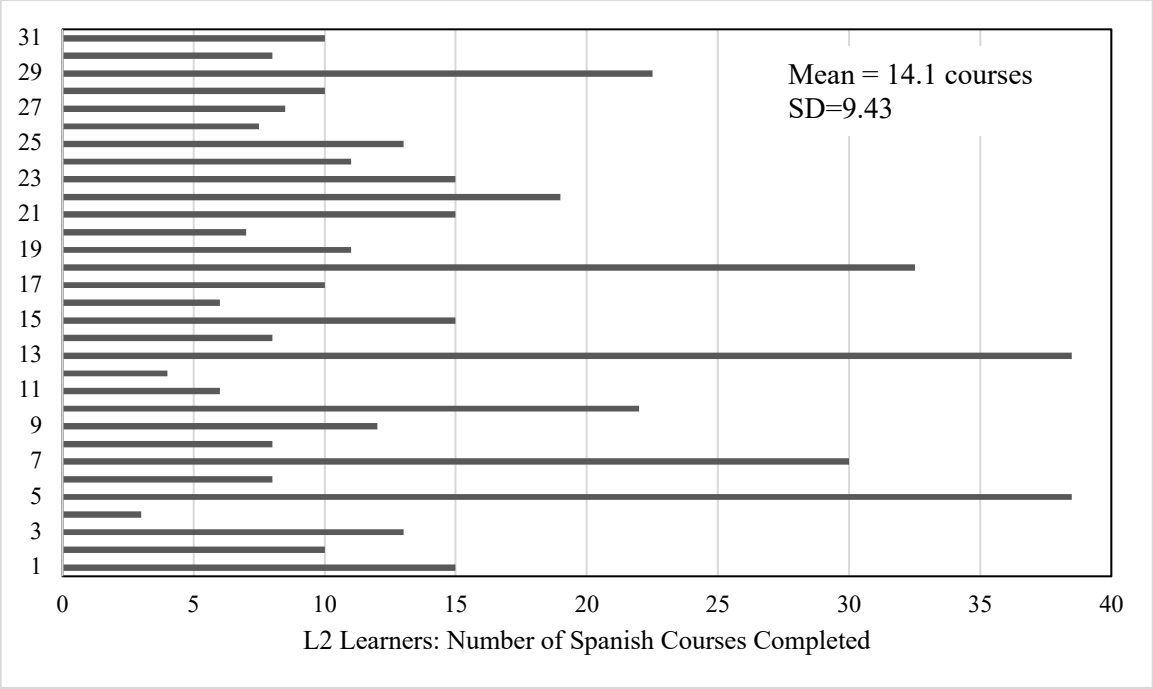


Figure 6. L2 Learners: Spanish instruction

L2 Learners analysis model for modality and instruction effects included the dependent variable, accuracy, (binary outcome 1 or 0), analyzed as a function of Condition, Modality (mod), Instruction and the interaction between Instruction and Modality as fixed effects, with random intercepts for subjects and items, and by subject random slopes for condition.

> Generalized LMM fit by maximum likelihood (Laplace Approximation) ['glmerMod']
> Family: binomial (logit)
> Formula: acc ~ cond + mod + sinst + mod * sinst + (1 + cond | subject) + (1 | item)

The main effect of modality in the comprehension of passive clauses by L2 learners was not significant. See Table 13. L2 learners' odds of being more accurate with adjectival passive clauses (estimate =4.0555, *SE* = 0.6201, $z = 6.540$, $p < 0.001$) were $e^{4.0555} \approx 57.71$ times than the odds of being accurate with verbal passive clauses. And there was a significant main effect of instruction (estimate= 0.4900, *SE*=0.2419, z=2.026, $p < 0.05$), thus more instructed L2 learners

were more likely to be accurate with these clauses. The interaction between Modality and Instruction was not significant (estimate =-0.1048, *SE* = 0.2519, *z* = -0.416, *p* = 0.6775).

Table 13 *L2 learners: MEM for passive clauses by modality and instruction*

					Random Effects	
		Fixed Effects			By Subject	By Items
Parameters	Estimate	*SE*	*z*	*p value*	*SD*	*SD*
Intercept	-1.8345	0.3703	-4.954	< 0.001	1.4383	0.5645
Adjectival Passive	4.0555	0.6201	6.540	< 0.001	2.7020	-
Modality W	-0.2165	0.2200	-0.984	0.3252	-	-
Instruction	0.4900	0.2419	2.026	< 0.05	-	-
Mod*Inst	-0.1048	0.2519	-0.416	0.6775	-	-

Data from proficiency oral and written measures were collected to find out whether proficiency affected comprehension of these clauses. From all proficiency measures collected (i.e. DELE, MLU, MATTR, Fluency) model convergence was achieved with DELE, MLU and MATTR data.

Model: Generalized LMM fit by maximum likelihood (Laplace Approximation) ['glmerMod']
Family: binomial (logit)
Formula: acc ~ cond + sprof + (1 + cond | subject) + (1 | item)
Formula: acc ~ cond + smattr + (1 + cond | subject) + (1 | item)
Formula: acc ~ cond + smlu + (1 + cond | subject) + (1 | item)

This model included the dependent variable, accuracy (binary outcome 1 or 0), analyzed as a function of condition, and one scaled proficiency measure (sprof=DELE, smattr=MATTR, smlu= MLU) as fixed effects, and subject and item as random effects with intercepts included, and by subject random slopes for condition. When random slopes for items were added, the model did not converge.

Main effects of DELE, MATTR and MLU were not significant in the comprehension of these clauses. See Table 14. These proficiency measures were scaled.

Table 14 *L2 learners: MEM by Type of Passive and proficiency*

					Random Effects	
		Fixed Effects			By Subject	By Items
Parameters	Estimate	*SE*	*z*	*p value*	*SD*	*SD*
Intercept*	-1.9850	0.3792	-5.235	< 0.001	1.5640	0.5659
Adjectival Passive*	4.0232	0.6096	6.600	< 0.001	2.6574	-
DELE	0.2941	0.2180	1.349	0.177	-	-
MATTR	0.2181	0.1954	1.116	0.264	-	-
MLU	-0.1155	0.2019	-0.572	0.567	-	-

**These numbers were in output with proficiency measure DELE, they varied slightly with MATTR and MLU.*

HL Learners

HL learners' mean accuracy score for passive clauses in the written modality was 0. 62 (SD=0.20) and in the aural modality it was 0.68 (SD=0.19). See Figure 7. HL learners' Spanish instruction was in average 8.17 courses (SD=7.95).

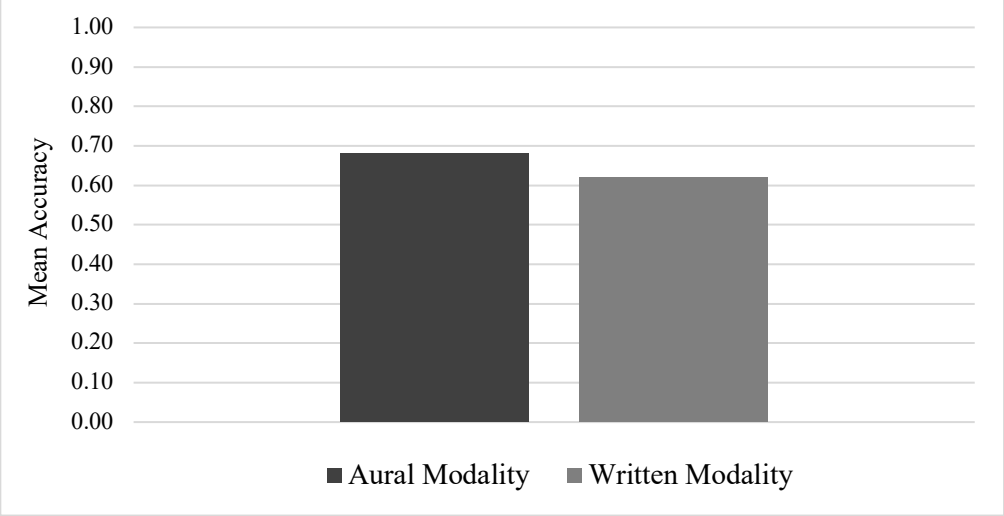


Figure 7. HL learners' Comprehension of Passive Clauses by Modality

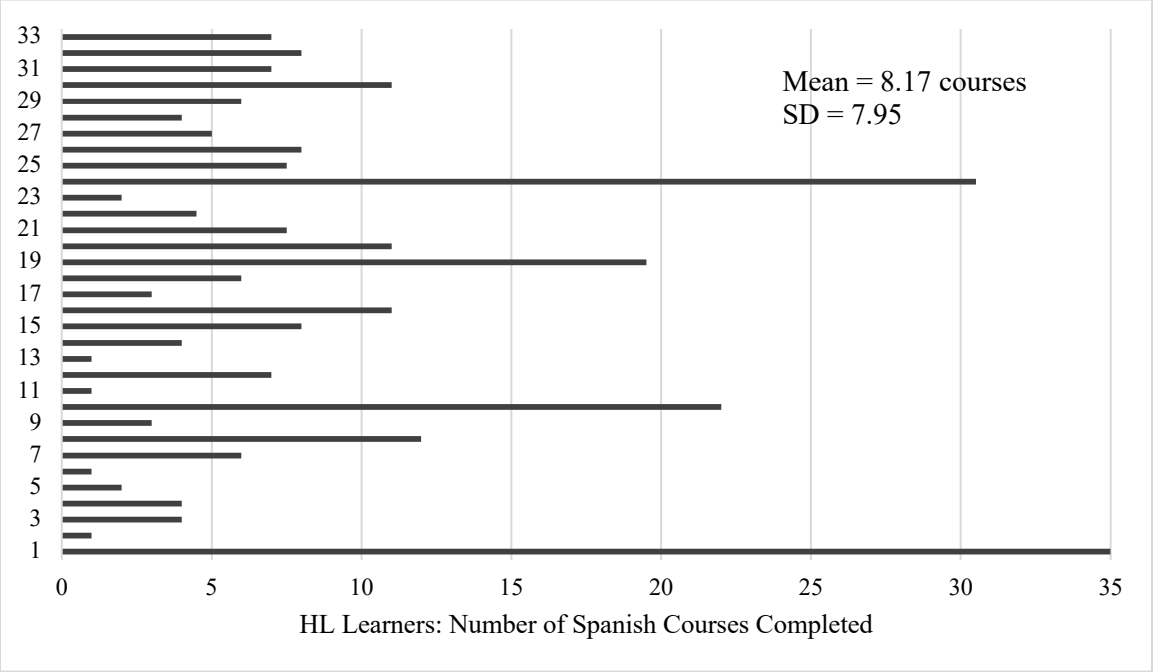


Figure 8. HL Learners: Spanish Instruction

Generalized LMM fit by maximum likelihood (Laplace Approximation) ['glmerMod']
Family: binomial (logit)
Formula: acc ~ cond + smod + (1 + cond | subject) + (1 + cond | item)
(Contrast coding was used for modality, aural modality = -0.5, written modality= 0.5).

The main effect of modality in the comprehension of passive clauses by HL learners was significant. See Table 15. HL learners' odds of accurate answers for aural modality (estimate = -0.6130, *SE* = 0.2299, *z* = -2.666, *p* = < 0.01) were $e^{0.6130} \approx 1.85$ times higher than the odds for written modality. HL learners' odds of being more accurate with adjectival passive clauses (estimate =4.7401, *SE* = 0.7947, *z* = 5.964, *p* = < 0.001) were $e^{4.7401} \approx 114.45$ times higher than the odds of being accurate with verbal passive clauses. The main effect of instruction (estimate= 0.01647, *SE*=0.03672, *z*=0.448, *p*=0.65379), was not significant.

Table 15 *HL learners: MEM for passive clauses by Modality and Instruction*

					Random Effects	
		Fixed Effects			By Subject	By Items
Parameters	Estimate	*SE*	*z*	*p value*	*SD*	*SD*
Intercept	-0.7958	0.3712	-2.144	< 0.05	1.8981	0.2405
Adjectival Passive	4.7401	0.7947	5.964	< 0.001	2.8163	0.2405
Modality	-0.6130	0.2299	-2.666	< 0.01	-	-
Instruction	0.01647	0.03672	0.448	0.65379	-	-

Note: Modality was coded using contrast coding (-0.5 for aural modality, and 0.5 for written modality). Instruction was added to the model with by subject slopes only
(Formula: acc ~ cond + smod + inst + (1 + cond | subject) + (1 | item).

Data from proficiency oral and written measures were collected to find out whether proficiency affected comprehension of these clauses. From all proficiency measures collected DELE (sprof), MLU (smlu), MATTR (smattr), FLUENCY (sflue). These proficiency measures were scaled.

Model: Generalized LMM fit by maximum likelihood (Laplace Approximation) ['glmerMod']
Family: binomial (logit)
Formula: acc ~ cond + smod + sprof + (1 + cond | subject) + (1 | item)
Formula: acc ~ cond + smod + smlu + (1 + cond | subject) + (1 | item)
Formula: acc ~ cond + smod + smattr + (1 + cond | subject) + (1 | item)
Formula: acc ~ cond + smod + sflue + (1 + cond | subject) + (1 | item)

These models included the dependent variable, accuracy (binary outcome 1 or 0), analyzed as a function of condition, modality scaled (smod) and one scaled proficiency measure, DELE, MATTR, MLU or Fluency, as fixed effects, and subject and item as random effects with intercepts included, and by subject random slopes for condition. When random slopes for items was added the model did not converge. Modality was contrast coded (aural = -0.5, written=0.5).

For HL learners, main effects of DELE, and MLU were significant ($p < 0.05$). Thus, both proficiency measures emerged a significant predictor of comprehension of passive clauses. See Table 16.

Table 16 *HL learners: LMM by Type of Passive, Modality and Proficiency*

					Random Effects	
		Fixed Effects			By Subject	By Items
Parameters	Estimate	*SE*	*z*	*p value*	*SD*	*SD*
Intercept	-0.7876	0.3549	-2.219	0.05	1.8281	0.1629
Adjectival Passive	4.6520	0.7499	6.204	< 0.001	2.8393	-
sMod	-0.6097	0.2296	-2.655	< 0.01	-	-
DELE	0.6138	0.2569	2.389	< 0.05	-	-
MLU	0.6730	0.2851	2.360	< 0.05	-	-
MATTR	0.4616	0.2875	1.605	0.10841	-	-
Fluency	0.4684	0.2878	1.628	0.10358	-	-

Even though heritage speakers performed significantly more accurate in the comprehension of verbal passive clauses than the L2 learners, their performance was below 50% accuracy. The frequency distribution shows that from the 33 HL learners, 12 participants scored between 0.58 and 1. That is sixty-four percent of participants scored 0.50 or below. This contrasts with the distribution of L2 learners that shows ninety-four percent of participants scoring 0.50 or below. See Table 17.

Table 17 *Frequency distribution of learners' accuracy scores with verbal passive clauses*

Mean accuracy score in verbal passive clause	Count of HL learners	Count of L2 learners
0	4	8
0.083	6	8
0.167	3	6
0.250	3	0
0.333	3	4
0.417	0	3
0.500	2	1
0.583	5	0
0.667	2	0
0.750	2	1
0.917	1	1
1.000	2	0

In addition, learners' mean accuracy scores in the grammaticality of the verbal passive (i.e. *La cena era servida por los meseros*. Dinner was$_{(ser\text{-IMPERFECT})}$ served by the waiters.) were not correlated to their mean scores in the comprehension of the verbal passive (i.e. *La cena era servida*, Dinner was$_{(ser\text{-IMPERFECT})}$ served.) L2 learners r=0.28, and HL learners r=0.37.

Data from the bilingual language questionnaire showed that the 5 HL learners whose mean accuracy scores with verbal passives was above 0.75 used Spanish when talking to their parents especially when they were between 6 and 11 years old, and three of them attended bilingual programs in elementary school. This contrasts with the four HL learners who scored below 0.08 with these clauses, who used English when talking to their parents during this age period, and did not attend bilingual programs. These data suggest that, while an important variable for comprehension of Spanish in general, early language use is potentially a determining factor in the comprehension of the verbal passive clauses with *era*.

6.2 Relative Clauses

6.2.1 Grammaticality Judgment Tasks (GJT)

To make sure that difficulties with relative clauses in the Picture Matching Task were due to the syntactic structure, grammar knowledge of inflectional morphology and subject verb inversion was tested in the GJT.

Both groups were, in average, accurate with inversion and inflectional morphology grammatical sentences. Mean accuracy score for grammatical sentences for L2 learners was 0.80 (SD=0.17), mean accuracy score for each participant ranged from 0.38 to 1.00, median 0.81. HL learners mean accuracy score for grammatical sentences was 0.76 (SD=0.13), mean accuracy scores for each participant ranged from 0.50 to 0.96, median 0.79. For inversion and inflectional morphology's ungrammatical sentences, L2 learners' mean accuracy score was 0.93 (SD=0.12), mean scores for each L2 learner ranged from 0.33 to 1.0, median 0.96. Nine participants' mean scores were below 0.67, the rest was above 0.67. HL learners' mean accuracy score for ungrammatical sentences was 0.82 (SD=0.18). Mean scores for each participant ranged from 0.29 to 1.00, median 0.88. Thirteen participants scored below 0.67. See Figure 9.

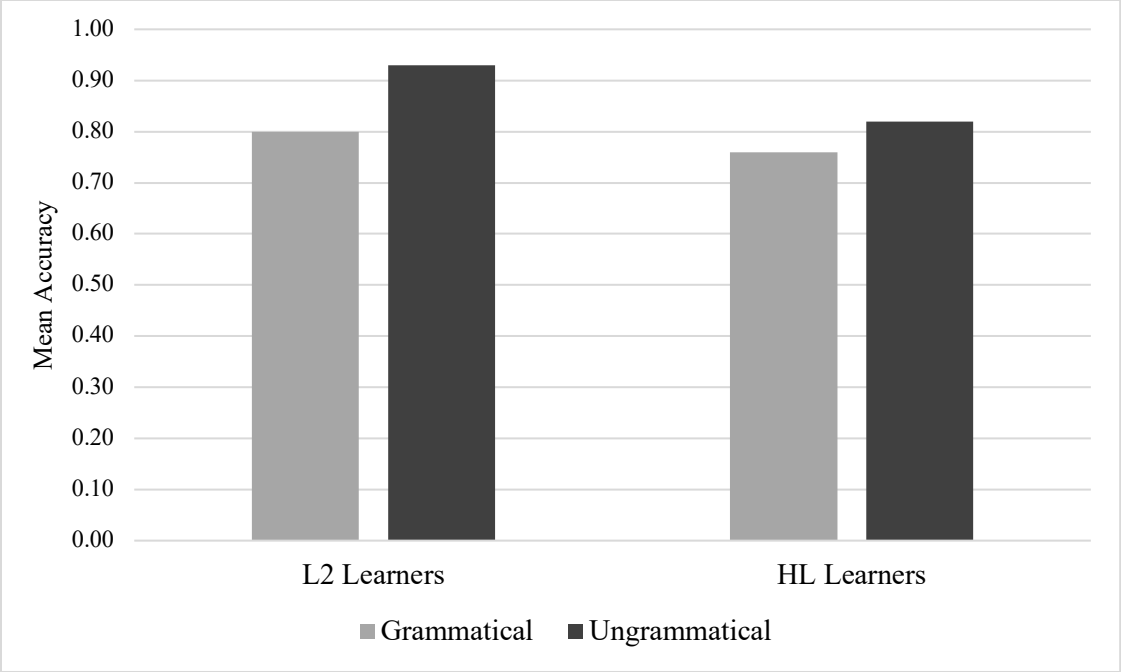


Figure 9. GJT: Mean accuracy on inflectional morphology and Subject-Verb inversion

Overall, results of the GJT show that HL and L2 learners have basic knowledge of the 3rd person singular and plural inflectional morphology and subject-verb inversion, but not all. Twenty-two participants' mean accuracy scores were below 0.67. For this dissertation all participants were included in analysis, but the fact that nine L2 learners and thirteen HL scored below chance (0.67) indicates that they might not have clear knowledge of the inflectional morphology or inversion.

The next section presents the PMT results which will inform us on whether these groups comprehend the relative clauses.

6.2.2 Picture Matching Task

The mean accuracy score for object relative clause without SV inversion (OR-OSV) for native speakers was 0.93(SD=.06), for HL learners 0.92 (SD=.10) and for L2 learners 0.88 (SD=0.12). The mean accuracy score for subject relative clauses without VO inversion (SR-

SVO) for native speakers was 0.89 (SD.11), HL learners 0.86(SD=0.13) and for L2 learners 0.89 (SD=0.09), see Figure 10.

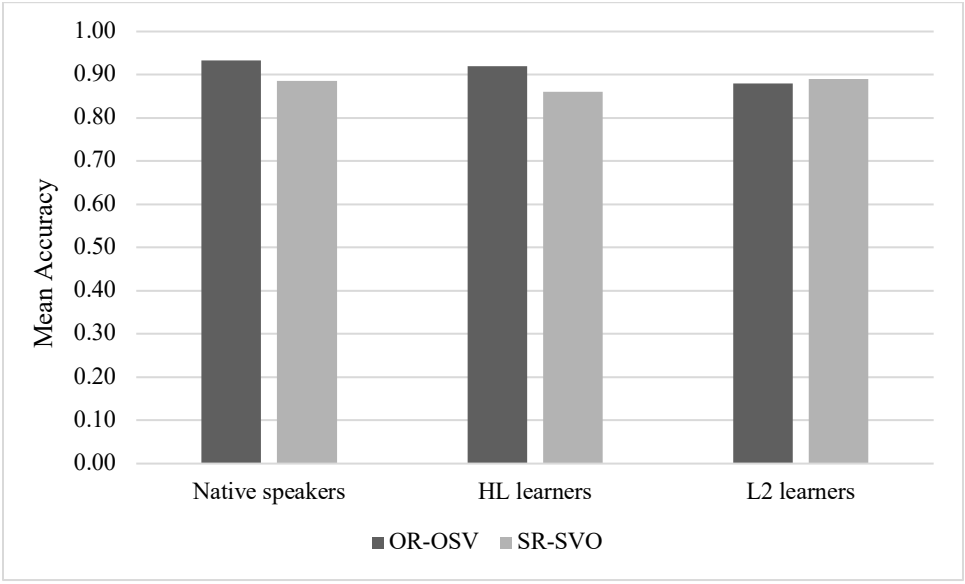


Figure 10. PMT: Mean accuracy score for object OSV and subject SVO relative clauses

These data were analyzed with mixed effects logistic regression using the 'glmer' command from the 'lme4'package (Bates et al., 2015) in R (R-Core-Team, 2019). Maximal mixed-effects models included crossed random effects for subjects and items when convergence was possible, following Barr, Levy, Scheepers, & Tily (2013). Only experimental groups were included in the analyses: L2 learners and HL learners. A fixed effect was considered significant if the *p* value was lower than 0.05.

To find out whether accuracy scores of subject relative clauses (SR-SVO) were significantly higher than accuracy scores for object relative clauses (OR-OSV) and whether age of meaningful exposure to Spanish affected comprehension of these clauses, the Linear Mixed Model (LMM) included the dependent variable, accuracy, (binary outcome 1 or 0), analyzed as a function of 'Condition' or Type of Relative Clause (SR-SVO vs. OR-OSV), and Group (L2 Learners vs. HL learners) as fixed effects, with random intercepts for subjects and items, and by

subject and by items random slopes for condition. LMM for HL and L2 learners' comprehension of SR-SVO and OR-OSV:

Generalized LMM fit by maximum likelihood (Laplace Approximation) ['glmerMod']
Family: binomial (logit)
Formula: acc ~ condition + group + (1 + condition | subject) + (1 + condition | item)

The main effects of Group (L2 Learners vs. HL learners) and Type of Relative Clause (SR-SVO vs. OR-OSV) were not significant. See Table 18.

Table 18 *L2 and HL learners' LMM output for SR - SVO and OR- OSV*

					Random Effects	
		Fixed Effects			By Subject	By Items
Parameters	Estimate	*SE*	*z*	*p value*	*SD*	*SD*
Intercept	2.7653	0.3149	8.781	< 0.001	0.9755	0.8460
SRE	-0.5752	0.3423	-1.681	0.0928	0.5167	0.3365
Group L2	0.0478	0.2762	0.173	0.8626	-	-

Mean accuracy scores for object relative clause with SV inversion (OR-OVS) were 0.85 (SD=0.14) for native speakers, 0.66 (SD=0.22) for heritage speakers, and 0.52 (SD=0.31) for L2 learners; for subject relative clause with VO inversion (SR-SOV), 0.61 (SD=0.29) for native speakers, for HL learners 0.19 (SD=0.19) and for L2 learners 0.42 (SD=0.28), see Figure 11.

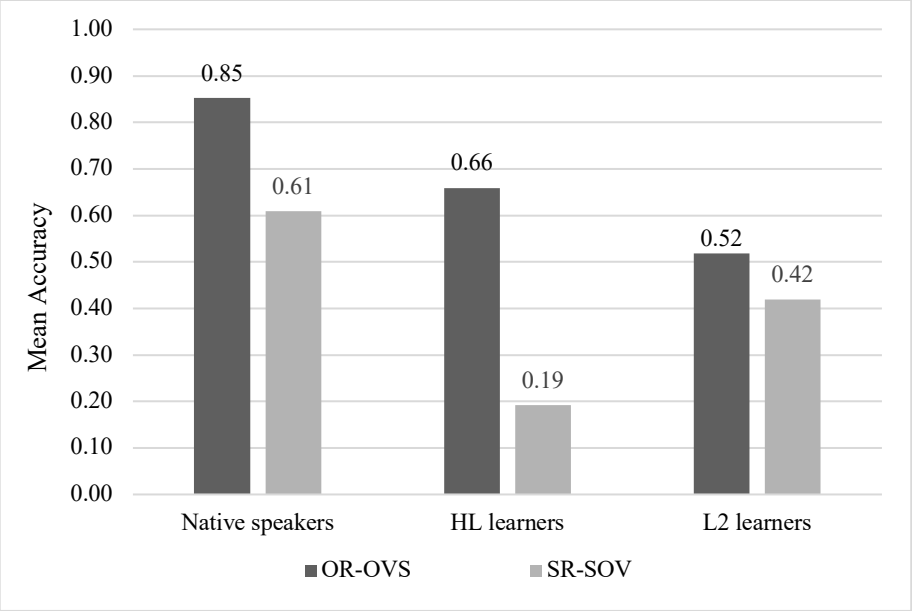


Figure 11. PMT: Mean accuracy scores for subject SOV and object OVS relative clauses

Note that mean accuracy scores for SR-SOV for both groups of learners stayed below chance, and for the native speakers it was low too (0.61, SD=0.29), as expected. Because subject relative clauses with VO inversion are infrequent in the input and limited to formal registers and creative/artistic writing, the analysis focused on how age of significant exposure to Spanish affected mean accuracy scores of OR-OVS and OR-OSV. The LMM included the dependent variable, accuracy, (binary outcome 1 or 0), analyzed as a function of Type of OR (condition) and Group as fixed effects, with random intercepts for subjects and items, and by subject and by items random slopes for condition. LMM for HL and L2 learners' comprehension of object relative clauses OSV (OR-OSV) and object relative clauses OVS (OR-OVS):

> Generalized LMM fit by maximum likelihood (Laplace Approximation) ['glmerMod']
> Family: binomial (logit)
> Formula: acc ~ condition + group + (1 + condition | subject) + (1 + condition | item)

The odds of accurate answers for OR-OVS (estimate =-2.2694 *SE* =0.3229, z =-7.029, $p < 0.001$) are $e^{0.2.2694} \approx 9.67$ times lower than the odds for OR-OSV. And the odds of L2 learners (estimate

=-0.5704, *SE* =0.2900, z = -1.967, $p < 0.05$) being accurate with these clauses are $e^{0.5704} \approx 1.77$ times lower than HL learners'. The main effects of Group and Type of Relative Clause were significant ($p<0.05$).

Table 19 *L2 and HL learners' LMM output for OR-OSV and OR-OVS*

					Random Effects	
		Fixed Effects			By Subject	By Items
Parameters	Estimate	*SE*	*z*	*p value*	*SD*	*SD*
Intercept	3.0435	0.3330	9.141	< 0.001	0.8851	0.8418
OR-OVS	-2.2694	0.3229	-7.029	< 0.001	1.1480	0.7359
Group L2	-0.5704	0.2900	-1.967	< 0.05	-	-

L2 learners mean accuracy scores for all relatives (SR-SVO, OR-OSV and OR-OVS) per modality were 0.71 (SD=0.16) for the aural modality and 0.81 (SD=0.15) for the written modality. SR-SOV was not included in the analysis because of its low frequency in the input.

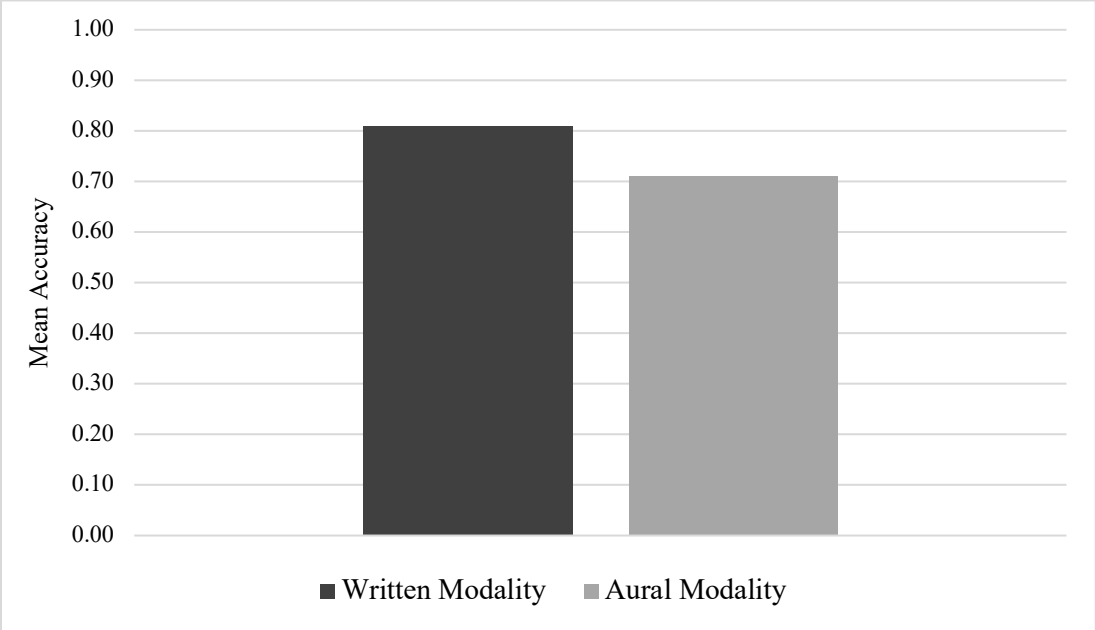


Figure 12. L2 learners: Relative Clauses mean accuracy scores per Modality)

To find out whether L2 learners' comprehension of SR-SVO, OR-OSV and OR-OVS was affected by Modality of task and Spanish Courses completed, a new LMM was created to analyze accuracy scores per modality for L2 learners. The model included the dependent variable, accuracy, (binary outcome 1 or 0), analyzed as a function of modality and instruction (sinst) as fixed effects, with random intercepts for subjects and items, and by subject random slopes for modality. Including 'condition' as a fixed effect created a non-convergence issue. Instruction was scaled.

Generalized LMM fit by maximum likelihood (Laplace Approximation) ['glmerMod']
Family: binomial (logit)
Formula: acc ~ modality + sinst + (1 + modality | subject) + (1 | item)

The main effect of modality was significant. L2 learners' odds of accurate answers in the written modality (estimate = 0.8942 *SE* =0.2387, z =3.745, $p < 0.001$) are $e^{0.8942} \approx 2.44$ times higher than the odds of accurate answers in the aural modality. The main effect of instruction was not significant ($p>0.05$).

Table 20 *L2 learners' LMM output for relative clauses by Modality and Instruction*

					Random Effects	
		Fixed Effects			By Subject	By Items
Parameters	Estimate	*SE*	*z*	*p value*	*SD*	*SD*
Intercept	1.4330	0.2759	5.194	< 0.001	0.9712	1.4600
Modality W	0.8942	0.2387	3.745	< 0.001	0.8213	-
Instruction	0.3461	0.2070	1.672	0.09455	-	-

HL learners mean accuracy scores for all relatives (SR-SVO, OR-OSV and OR-OVS) per modality were 0.80 (SD=0.10) for the aural modality and 0. 83(SD=0.12) for the written modality. SR-SOV was not included in the analysis because of its low frequency in the input.

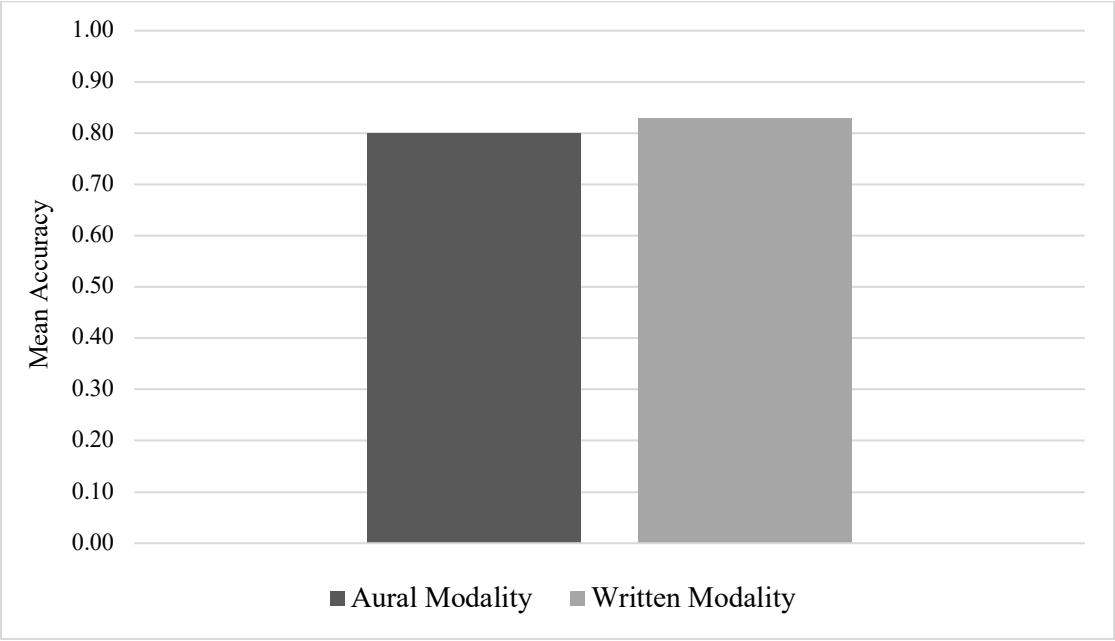


Figure 13. HL learners: Relative Clauses mean accuracy scores per Modality)

To find out whether comprehension of SR-SVO, OR-OSV and OR-OVS was affected by Modality of task and Spanish Courses completed. The model included the dependent variable, accuracy, (binary outcome 1 or 0), analyzed as a function of modality and instruction (sinst) as fixed effects, with random intercepts for subjects and items. Including random slopes for either subject or items created a non-convergence issue. Instruction was scaled.

Generalized LMM fit by maximum likelihood (Laplace Approximation) ['glmerMod']
Family: binomial (logit)
Formula: acc ~ modality + sinst + (1 | subject) + (1 | item)

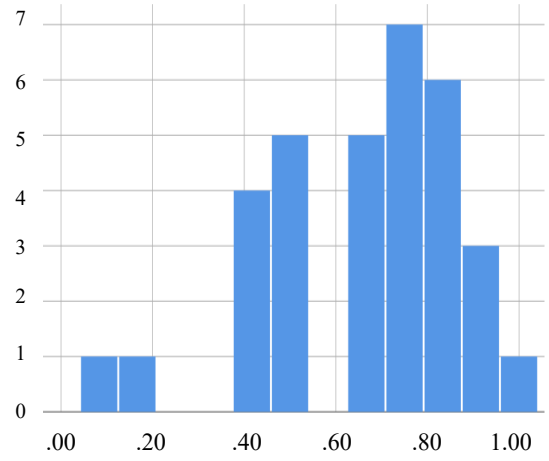
For HL learners the main effect of modality and that of instruction were not significant (p>0.05). See Table 21.

Table 21 *HL learners' LMM output for relative clauses by Modality and Instruction*

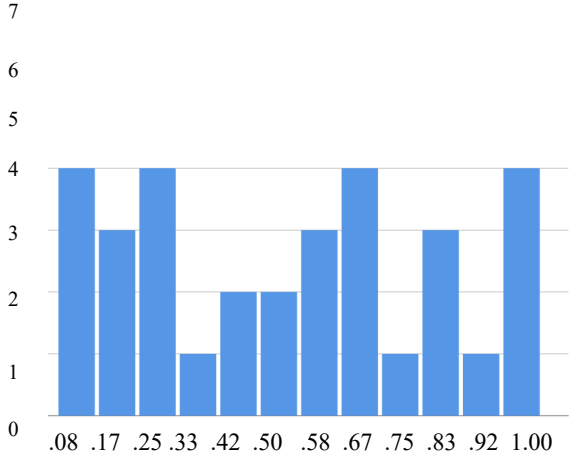
					Random Effects	
		Fixed Effects			By Subject	By Items
Parameters	Estimate	*SE*	*z*	*p value*	*SD*	*SD*
Intercept	1.7990	0.1741	10.331	< 0.001	0.5227	0.9414
Modality W	0.2750	0.1585	1.735	0.0827	-	-
Instruction	0.1801	0.1284	1.402	0.1608	-	-

Although there was no significant difference between L2 learners and HL learners' mean accuracy score for the OR-OVS, standard deviation for each group of learners indicated that there is less variability in the scores of the HL learners. See Table 22.

Table 22 *Frequency of learners' mean accuracy scores for OR-OVS*



HL learners	Frequency
0.08	1
0.17	1
0.42	4
0.5	5
0.67	5
0.75	7
0.83	6
0.92	3
1	1



L2 Learners	Frequency
0.08	4
0.17	3
0.25	4
0.33	1
0.42	2
0.5	2
0.58	3
0.67	4
0.75	1
0.83	3
0.92	1
1	4

Because Sánchez-Walker (2013) found that HL with two Spanish-speaking parents were more accurate than those with one Spanish-speaking parent, data of parent country of origin and language spoken was studied. The seven participants who had only one Spanish-speaking parent varied in the accuracy with OR-OVS, see Table 23. There was no visible tendency in parental Spanish input and comprehension of this clause either.

Table 23 *HL learners with one Spanish-speaking parent*

HL learners	Mean accuracy scores for OR-OVS
1	0.17
2	0.17
3	0.67
4	0.83
5	0.83
6	1.00
7	1.00

Because in Sánchez-Walker & Montrul (2016) L2 learners' mean accuracy score with the OR-OVS was greater in the group with advanced proficiency in the DELE test, the learners were divided by written DELE proficiency, see Figure 14.

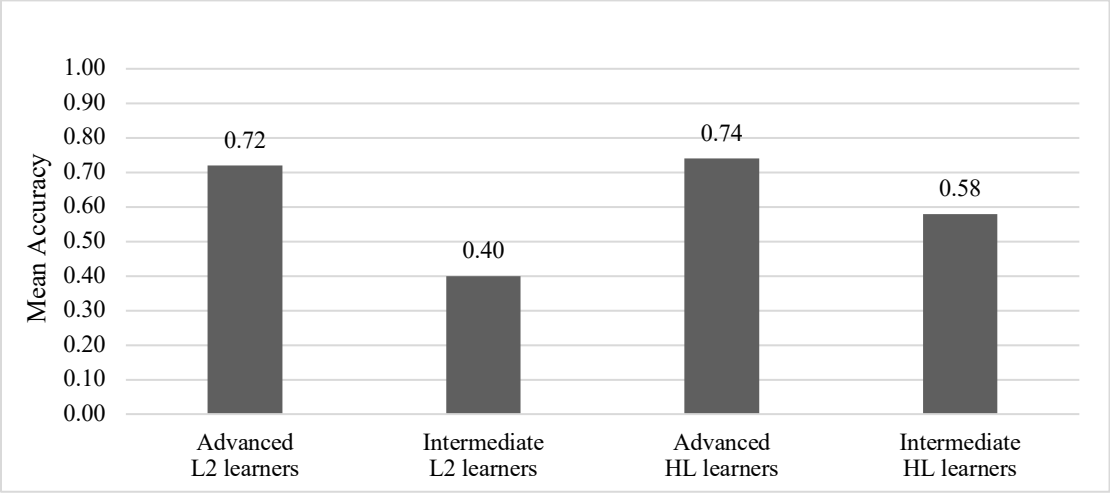


Figure 14. OR-OVS by learners' written proficiency

A LMM was created to find out whether proficiency was a significant factor in the comprehension of OR-OVS for both groups. The model included the dependent variable, accuracy, (binary outcome 1 or 0), analyzed as a function of Group and written proficiency (DELE) as fixed effects, with random intercepts for subjects and items, and by subject random slopes for written proficiency. Scores for DELE were scaled.

Generalized LMM fit by maximum likelihood (Laplace Approximation) [glmerMod]
Family: binomial (logit)
Formula: acc ~ group + sprof + (1 + sprof | subject) + (1 | item)

Main effect of group was not significant (estimate =-0.2893 *SE* =0.3306, *z* =-0.875, *p* =0.38151), but accuracy with OR-OVS was significantly accounted for by written proficiency (estimate =0.8177 *SE* =0.1682, *z* =4.860, $p < 0.001$). Learners are more likely to be accurate with these clauses as proficiency increases.

Table 24 *LMM output for relative clauses by Group and written proficiency*

					Random Effects	
		Fixed Effects			By Subject	By Items
Parameters	Estimate	*SE*	*z*	*p value*	*SD*	*SD*
Intercept	0.6261	0.2385	2.626	< 0.01	1.049121	0.004648
Group L2	-0.2893	0.3306	-0.875	0.38151	0.314660	
DELE	0.8177	0.1682	4.860	< 0.001		

Oral proficiency was also measured to find out whether oral proficiency affected comprehension of relative clauses. See Table 25.

Table 25 *Proficiency measures for HL and L2 learners*

Proficiency	HL Learners	L2 Learners
Written DELE (50 max.)		
Mean Score (SD)	38.58 (6.82)	35.03 (8.20)
Score Range	15-50	25-47
Oral Mean Scores (SD		
MATTR	0.52 (0.04)	0.50 (0.05)
Score Range	0.44-0.59	0.39-0.59
MLU	9.16 (1.80)	9.95 (1.68)
Score Range	5.93-13.09	7.16-14.25
Fluency (words/mins)	88.40 (23.84)	72.57 (21.88)
Score Range	49.15 – 134.27	47.76 – 128.28

To find out whether proficiency as measured for this dissertation (i.e. DELE, MLU, MATTR, Fluency) affected comprehension of relative clauses by group, LMM were created for each measure for each group, each model included the dependent variable, accuracy for SR-SVO, OR-OSV and OR-OVS, (binary outcome 1 or 0), analyzed as a function of a proficiency measure (DELE, MATTR, MLU or Fluency) as fixed effects, with random intercepts for subjects and items, and by subject and items random slopes for proficiency as long as the model converged. Scores for proficiency measures were scaled.

The following models were created to analyze how proficiency accounted for accuracy in relative clauses' comprehension by HL learners.

Model: Generalized LMM fit by maximum likelihood (Laplace Approximation) ['glmerMod']
Family: binomial (logit)
Formula: acc ~ sprof + (1 + | subject) + (1 + sprof | item)
Formula: acc ~ smattr + (1 + smattr | subject) + (1 + smattr | item)
Formula: acc ~ acc ~ smlu + (1 + smlu | subject) + (1 | item)
Formula: acc ~ sfluency + (1 | subject) + (1 + sfluency | item)

For HL learners, DELE and MLU significantly accounted for accuracy in the relative clauses ($p < 0.01$). The main effect of Fluency and MATTR were not significant ($p > 0.05$). See Table 26.

Table 26 *HL learners – Relative Clauses: LMM for proficiency measures*

					Random Effects	
		Fixed Effects			By Subject	By Items
Parameters	Estimate	*SE*	*z*	*p value*	*SD*	*SD*
Intercept	1.7910	0.1618	11.069	< 0.001	0.3696	0.9247
sDELE	0.3555	0.1167	3.047	< 0.01		0.3010
Intercept	1.8514	0.1766	10.48	< 0.001	0.2382	0.9539
sMATTR	0.2715	0.1560	1.74	0.0818	0.2839	0.2875
Intercept	1.81848	0.17129	10.617	< 0.001	0.3742	0.9541
sMLU	0.22040	0.08399	2.62	< 0.01	0.1747	-
Intercept	1.8044	0.1769	10.20	< 0.001	0.5241	0.9488
Fluency	0.1108	0.1403	0.79	0.43	-	0.2800

The following models were created to analyze how proficiency accounted for accuracy in relative clauses' comprehension by L2Learners.

Model: Generalized LMM fit by maximum likelihood (Laplace Approximation) ['glmerMod']
Family: binomial (logit)
Formula: acc ~ Sprof + (1 + Sprof | subject) + (1 | item)
Formula: acc ~ smattr + (1 | subject) + (1 + smattr | item)
Formula: acc ~ mlu + (1 | subject) + (1 | item)
Models with fluency did not converge.

For L2 learners DELE and MATTR significantly accounted for accuracy in relative clauses. The main effect of MLU was not significant, and the models with fluency did not converge.

Table 27 *L2 learners- Relative Clauses: LMM for oral proficiency measures*

		Fixed Effects			*Random Effects*	
					By Subject	By Items
Parameters	Estimate	*SE*	*z*	*p value*	*SD*	*SD*
Intercept	1.7866	0.2302	7.761	< 0.001	0.5819	1.3636
DELE	0.8070	0.1566	5.153	< 0.001	0.4043	
Intercept	1.7152	0.2468	6.949	< 0.001	0.8088	1.4091
sMATTR	0.4113	0.1893	2.173	< 0.05	-	0.3951
Intercept	1.7183	0.2566	6.696	< 0.001	0.8916	1.4293
sMLU	0.3344	0.1870	1.788	0.0738		

The next section discusses these findings and answers the research questions.

CHAPTER 7: DISCUSSION

This study investigated comprehension of complex syntax in Spanish by heritage language (HL) learners and second language (L2) learners of Spanish. Specifically, this study focused on comprehension of passive and relative clauses, structures that involve syntactic movement and change in the thematic roles of a sentence. To contribute to current theoretical debates on the role of input and age in L2 and bilingual language acquisition, and to current pedagogical inquires on how instruction can be beneficial for HL learners, this study set out to find out whether age of onset of meaningful exposure (and consequently type of L2/HL input and experience), modality of the task, and Spanish instruction affected adult L2 learners and heritage speakers' comprehension of these structures of later language development that are acquired early (by age 3 or 4) but are mastered and fully developed at a later age during the school-age period.

116 participants completed the oral and a written version of a picture matching task that tested comprehension of the relative and passive clauses, an oral and a written version of a grammaticality judgment task that evaluated knowledge of basic grammar crucial for the comprehension of these clauses. They also completed an oral narrative that was coded to determine oral proficiency with three different measures (i.e. moving average type-token ratio (MATTR), mean length of utterance (MLU) and fluency, in words per minute), a cloze test that measured written proficiency and a bilingual language questionnaire in which participants indicated linguistic experience and Spanish courses they had completed at time of testing. The data analyzed were from 95 participants who met the required criteria for the study (for L2 learners being English speakers from birth and having grown up in an English-speaking country; for HL learners being born in the US or having come to the US before age 3 in a Spanish-

speaking family; for native speakers, Spanish being their first language and having grown up in a Spanish speaking country).

The relative clauses used in this study were subject and object relative clauses with inanimate NPs and reversible contexts in which either the subject or the object could perform the action described by the verb in the complementizer phrase (CP). The sentences were designed controlling for plausibility to prevent a context bias favoring one interpretation or another. The only way for the learners to determine which NP was the subject or the object in the clause was to know the inflectional morphology of the verb that agreed with the subject. Only third person singular and plural verb conjugations were used.

There are two possible word orders for a subject relative clause (SR) in Spanish (i.e. SR with SVO order in the CP, and SR with SOV order in the CP) and two possible word orders for an object relative clause (OR) in Spanish (i.e. OR with OSV word order in the CP and OR with OVS order in the CP). In these relatives, one NP was singular and the other one was plural to avoid ambiguity and the use of the DOM '*a*' that would mark the object in the CP, see (75)(78). Relative clauses are embedded clauses that modify a noun phrase (NP), head of the main clause, for this dissertation the head was either in the subject or in the object position. In Spanish, these clauses involve a type of *wh*-movement in which a null *wh*-word moves to the Spec of the CP, just like a *wh*-word would, leaving a trace or a gap within the clause. It is generally agreed that, although many factors affect ease of comprehension of relative clauses, the linear distance (LD) between the head and the gap accounts for subject relative clauses being easier to process than object relative clauses, at least in head-initial languages. However, the linear distance is not the only factor that affects comprehension of theses clauses. Hawkins (1989) showed that burden on working memory affects L2 learners parsing of relative clauses. His data suggest that when

learners with lower proficiency see the NP and the following CP with a verb first, their intuition is to fill a subject gap. This study with the picture matching task investigated whether this was the case with HL and L2 learners because the OR (OVS) presents a NP and then the verb: NP_{OBJECT} +Verb + $NP_{SUBJECT}$. The verb's inflectional morphology indicated what NP was the subject. If learners saw the first NP and then the Verb, and interpreted it as a subject relative (i.e. filling out the subject gap instead of the object gap) they would pick the picture that showed the subject relative. Data from previous research show that this is the case with L2 learners and with HL learners. For L2 learners the tendency to incorrectly interpret an OR (OVS) as a SR (SVO) disappeared as proficiency increased (Sánchez-Walker & Montrul, 2016). For HL language quantity/quality through their childhood, instead of proficiency, seemed to play a role in correct comprehension of OR (OVS). Those with two Spanish-speaking parents performed better with the OR (OVS) (Sánchez-Walker, 2013).

Based on the linear distance (LD) in words between the head and the gap in the relative clauses, the ease of comprehension of these relatives should have being: SR-SVO>OR-OVS>SR-SOV>OR-OSV, (where '>' means easier to comprehend than).

(75) SR-SVO (LD=1 word)

Este es el $libro_{NP\text{-}SUBJECT\text{-}singular}$ que $cubrió_{VERB\text{-}singular}$ las $revistas_{NP\text{-}OBJECT\text{-}plural.}$

This is the $book_{NP\text{-}SUBJECT\text{-}singular}$ that $covered_{VERB\text{-}singular}$ the $magazines_{NP\text{-}OBJECT\text{-}plural.}$

(76) SR-SOV (LD=3 words)

Este es el $libro_{NP\text{-}SUBJECT\text{-}singular}$ que las $revistas_{NP\text{-}OBJECT\text{-}plural}$ $cubrió_{VERB\text{-}singular.}$

This is the $book_{NP\text{-}SUBJECT\text{-}singular}$ that the $magazines_{NP\text{-}OBJECT\text{-}plural}$ $covered_{VERB\text{-}singular}$.

(77) OR-OSV (LD=4 words)

Este es el $libro_{NP\text{-}OBJECT\text{-}singular}$ que las $revistas_{NP\text{-}SUBJECT\text{-}plural}$ $cubrieron_{VERB\text{-}plural}$.

This is the $book_{NP\text{-}OBJECT\text{-}singular}$ that the $magazines_{NP\text{-}SUBJECT\text{-}plural}$ $covered_{VERB\text{-}plural}$.

(78) OR-OVS (LD=2 words)

Este es el libro$_{\text{NP-OBJECT-singular}}$ que cubrieron$_{\text{VERB-plural}}$ las revistas$_{\text{NP-SUBJECT-plural}}$.

This is the book$_{\text{NP-OBJECT-singular}}$ that covered$_{\text{VERB-plural}}$ the magazines$_{\text{NP-SUBJECT-plural}}$.

Thus, the first research question of this study asked whether subject relative clauses were easier to comprehend than object relative clauses for L2 and HL learners as predicted by the LD between the head and the gap. Results showed that SR(SVO) and OR(OSV) were both easily comprehended by both groups of learners. The fact that SR(SVO) and OR(OSV) show the same word order as their English counterparts might explain the result. But until a study with speakers of another L1 that does not have this word order is conducted, the conclusion cannot be confirmed with certainty. Contrary to the prediction based on the LD, comprehension of SR(SOV) was low, which is explained by how infrequent they are in the input.

The second research question asked whether OR (OVS) were interpreted as SR (SVO) by L2 and HL learners. Results show that this was the case, but as seen before it varied with proficiency. What was not seen before is that as written DELE proficiency increased so did correct interpretation of OR(OVS) for both groups, not only for the L2 learners. In addition, oral proficiency also accounted for L2 and HL learners' performance with the OR (OVS). MATTR could predict L2 learners' comprehension of OR (OVS) and MLU accounted for HL learners' performance with the OR (OVS). However, an important finding of this investigation is based on the distribution of mean accuracy scores for the OR(OVS). HL learners mean accuracy scores for the OR (OVS) showed a normal distribution with most learners reaching above 61% accuracy, whereas the L2 learners mean accuracy scores for the OR (OVS) showed a uniform distribution, which indicated that the range of mean accuracy scores was broad, and most learners mean accuracy scores were below 60%. This type of distributions indicates that in a classroom where

HL and L2 learners with mean written proficiency in Spanish at an intermediate level are enrolled together in the same Spanish course, the HL learners would be more likely to be familiar with this structure than L2 learners.

HL learners' comprehension of OR (OVS) varying as a function of whether one or two parents spoke Spanish in the house, was not found in these data.

The prediction based on the LD was not borne out and highlights the importance of extra-linguistic factors in the comprehension of these clauses. Frequency of the structure affects comprehension of relative clauses, and so does written and oral proficiency as measured in this investigation.

The second construction investigated were the passive clauses, specifically verbal and adjectival passive clauses with the copulas in the imperfect tense *era* and *estaba*, respectively. See (79)(80). Comprehension of verbal passive clauses, as opposed to the comprehension of adjectival passive clauses, was predicted to be more difficult for both groups of leaners. First, there is a canonical construction for the verbal passive clause in the past with the copula in the preterite tense *fue,* with which learners are more familiar. Second, another passive voice construction, the reflexive passive, also known as morphological passive or *se*-passive, is more frequent in Spanish. Third, the verbal passive clause with the copula in the imperfect tense in HL and L2 acquisition is not common in oral communication. And, last, the imperfect tense is vulnerable in L2 and HL learners' grammars.

This study was designed with truncated passive clauses with actional verbs and irreversible contexts, meaning that the theme could not perform the action stated by the verb. Instead the theme was always the object of, or was in a state resulting from the action stated by the verb.

(79) La comida estaba servida. *Adjectival/ Stative Passive*
Dinner was (estar.IMPERFECT) served.

"Dinner was served."

(80) La comida era servida. *Verbal/Eventive Passive*

Dinner was $_{(ser.IMPERFECT)}$ served.
"Dinner was being served."

Unlike adjectival passives, verbal passive clauses trigger a reanalysis of the sentence to organize the thematic roles. Both passive clauses in this study were formed with past participles. To comprehend adjectival/stative passives with participles, learners had to realize that a description of a state or final result followed the copula *estar*. To comprehend verbal passive clauses, learners had to know that the first noun phrase was not the agent, but the object. The reanalysis is triggered at the past participle in English (Mack et al., 2013). I assume that Spanish reanalysis involves the copula. If the copula was *ser*, the clause was a verbal passive not an adjectival passive. In going back to the copula, learners had to integrate the meaning of the imperfect form *era*, which refers to an ongoing or habitual action in the past. L2 and HL learners are familiar with passive voice structures and they have been shown to be familiar with the canonical passive clause with *fue* in Spanish. Thus, comprehension of these passive clauses required not only knowledge of its syntax, but also of the complementary distribution of *ser* and *estar*. Acquiring the complementary distribution of the copulas is a hard task for L2 learners and HL learners as they need to acquire not only their irregular inflectional morphology but also the contrasts between each copula regarding syntax, semantics and pragmatics, a contrast that is not present in English.

Results showed that L2 and HL learners were more accurate with adjectival passive clauses than with verbal passive clauses. These difficulties in the comprehension of verbal passive clauses show that learners have not yet acquired the full spectrum of copula uses and interpreted *era* in the verbal passive clause as *estaba* in an adjectival passive clause, a simpler

construction. It could be argued that the absence of the agent in the verbal passive might explain why verbal passive clauses were interpreted as adjectival passive clauses, but results also showed that learners evaluated full verbal passive clauses (with the agent include in a 'by agent' phrase) in the canonical past tense *fue* significantly higher than they evaluated full verbal passive clauses in the imperfect tense, which showed that they had knowledge of the syntax and morphology required to form verbal passive clauses. Difficulties in the comprehension of verbal passive clauses with *era* explain why in previous studies (Bruhn de Garavito & Valenzuela, 2008; Valenzuela et al., 2015) L2 and HL learners showed low acceptance scores for the verbal passive clause with *era*. Learners' misinterpretation of this structure is rooted on a grammar that has yet to incorporate the verbal passive clause with the copula *ser* in the imperfect tense, contrary to native speakers' low acceptance scores for this structure. Native speakers who participated in the pilot study and those who completed the PMT tasks comprehended the verbal passive clause with the copula in the imperfect tense. But, after completing the tasks, most of them volunteered that they preferred to use other passive clause constructions over the verbal passive clause with the copula in the imperfect tense. This indicated that native speakers' grammar allows this interpretation, even if it is not their preferred passive clause construction.

Neither oral nor written proficiency accounted for L2 learners' comprehension of passive clauses. But HL learners' comprehension of the passive clauses was accounted for by written proficiency (DELE) and the oral measure mean length of utterance (MLU). The written proficiency tested knowledge of vocabulary, verbal conjugations, prepositions, and adjectives. MLU is the ratio of the number words to the number of utterances. MLU is used to measure first language development (Bley-Vroman, 1990), and in bilingual language acquisition it is used to measure language dominance (Unsworth, Chondrogianni, & Skarabela, 2018). HL and L2

learners' mean accuracy scores for DELE and for MLU did not differ significantly. Thus, the main difference between the two groups is the age of meaningful exposure to Spanish. Hence, these results indicate that even though both groups showed similar lexical diversity and ability to put words together to form sentences, early language experience accounts for accurate comprehension of these passive clauses, and therefore, for knowledge of copula use in these passive clauses. Results also indicate that although the HL shows signs of attrition and incomplete acquisition (Montrul, 2005), mastery of the HL can improve too. For L2 learners these results mean that the difference between these two clauses have to be explicitly taught because even when reaching higher proficiency levels, they continue to ignore the meaning of the copula *ser* in the imperfect tense in verbal passive clauses.

Taken together results from the comprehension of relative clauses and passive clauses in this study show that L2 leaners and HL learners of intermediate written proficiency (as measured by DELE) parse clauses with complex syntax assigning them the simplest interpretation with the information that they are able to integrate. This strategy explains why object relative clauses OVS were interpreted as subject relatives SVO: the learners interpreted the sentence filling the subject gap. The inability to integrate the information for the verbal inflectional morphology at lower proficiency levels has also been seen with case marking and verbal agreement in German (Hopp, 2006). In the case of passive clauses, the adjectival passive clause presented a simpler scenario. With adjectival passive clauses the downgrading of the agent is greater than with verbal passive clauses. In most contexts an adjectival passive clause with the 'by agent' phrase is ungrammatical (e.g. **La cena estaba servida por la mamá*. 'Dinner was$_{ESTAR}$ served by the mother'.), thus the subject of the adjectival passive clauses is perceived as such, and not as a theme in the given context. On the contrary, verbal passive clauses' subject is the theme, and the

agent is downgraded to a point because it can be mentioned in a 'by agent' phrase in a full verbal passive clause (e.g. *La cena era servida por la mamá*. 'Dinner was$_{SER}$ served by the mother.'). Having to choose either an adjectival or a verbal passive clause, the learners interpreted the first noun of a verbal passive clause as a subject being described, and failed to integrate the meaning of the copula *ser* that would have led them to interpret it correctly as the theme of a verbal passive clause. Interpreting object relative clauses OVS as subject relative clauses diminishes as learners' proficiency increases. Interpretation of verbal passive clauses as adjectival passive clauses does not change even as proficiency increases, which bring about the question of whether this would be the case if the verbal passive with the copula in the imperfect tense was taught in a classroom.

Results also suggested that HL who were in bilingual language programs in elementary school performed better with verbal passive clauses in the imperfect tense than those who were in English immersion programs. Although these results were observed in four participants, it should be taken as a first step in evaluating how HL who complete bilingual programs in elementary school comprehend Spanish complex sentences when they are adults, and it also leads to asking how much can early bilingual instruction contribute to developing and maintaining the heritage language. These results underscore the importance of the prior knowledge that both groups of learners bring to the classroom.

This thesis also sought to find out whether comprehension of relative and passive clauses (with the copula in the imperfect tense, *era*) was affected by age of onset of meaningful exposure to Spanish. Studies have shown that early exposure to the language results in monolingual-like or close to monolingual-like competence on some areas of grammar (Montrul, 2018). But,

subsequent variation in input quantity and quality results in incomplete acquisition or language loss of certain areas of the HL grammar.

Results from the comprehension of passive and relative clauses show age of meaningful exposure as a robust predictor of successful language acquisition. HL learners were significantly more accurate than L2 learners in the comprehension of passive clauses and significantly more accurate in the comprehension of the object relative clause OR-OVS that when misinterpreted could be understood as a subject relative. This indicates that early exposure to Spanish confers HL learners an advantage in the comprehension of clauses with complex syntax.

An important finding of this dissertation is that a combination of factors at an early age conferred advantages to HL learners in the comprehension of verbal passive clauses with *era*, namely early instruction and language use. The data suggested that parental Spanish use with learners (input), combined with learners' Spanish language use with parents (output), and early frequent Spanish use (between the ages of 6 and 10) positively influenced comprehension of verbal passive clauses with *era.* Moreover, the data suggested that early bilingual education could be a contributing factor too. These findings confirm what recent HL studies have shown, that even if acquired as a minority language, when more input and early education is provided in the HL, the difference between ultimate attainment in monolingual language acquisition and ultimate attainment in bilingual language acquisition is reduced (Kupisch & Rothman, 2016; Montrul, 2016). More importantly, results of this thesis show that producing the language (i.e. output) at an early age is equally important. As it is known, some parents allow their children to address them in the majority language, limiting the learners' opportunities to produce the language. Data from this dissertation shows that not giving them the opportunity to produce the language at an early age appears to be detrimental for HL development, at least for those areas of

grammar that are harder to acquire. Indeed, data from other studies show language output as the most important factor to "add knowledge to their language" (Bohman, Bedore, Peña, Mendez-Perez, & Gillam, 2010). Bohman et al. (2010) explain that "using a language (i.e output) forces the learner to process the language in a way that only hearing it (i.e. input) does not." Unsworth (2015) and Au et al. (2008) also found that output better predicted children's performance in their HL.

Regarding relative clauses, research had shown that early English-Spanish bilinguals comprehended and were able to produce subject-subject relative clauses by the time they reached the fourth grade, and that they were able to comprehend object relative clauses. But research in other languages (i.e. Russian and Korean) had also showed that HL learners undergo language attrition and by the time they are adults they understand subject relative clauses and struggle with object relative clauses (O'Grady et al., 2001; Polinsky, 2011). College age L2 and HL learners had shown knowledge of the embedded OR (OSV) which resembles the embedded ORC in English (i.e. The submarine$_{\text{Object-sg}}$ [$_{\text{CP}}$ that the boats$_{\text{Suject-pl}}$ sank$_{\text{Verb-pl}}$]). Sánchez-Walker & Montrul (2016) found that advanced proficiency L2 learners were more accurate than L2 learners of intermediate proficiency in the comprehension of these clauses. Sánchez-Walker (2013) found that heritage speakers with intermediate proficiency and two Spanish-speaking parents comprehended object relative clauses better than heritage speakers with intermediate proficiency and one Spanish-speaking parent, and that L2 learners were less accurate than HL learners with two Spanish-speaking parents in the comprehension of object relative clauses, but equally inaccurate than heritage speakers with one Spanish-speaking parent. Results from this dissertation showed that indeed, written proficiency accounts for relative clauses comprehension

of not only L2 learners but also of HL learners, unlike number of Spanish-speaking parents that was shown to be irrelevant, contrary to what was found in Sánchez-Walker (2013).

This dissertation also investigated the effect of task modality in the comprehension of these clauses. L2 and HL learners' linguistic experience influences their abilities with language tasks because each experience emphasizes different language skills (Bowles, 2011b; Montrul, 2016). L2 learners' meaningful exposure to the language is mainly with a textbook, reading and writing in the classroom, where opportunities for verbal interactions are limited, this experience helps them develop metalinguistic or explicit knowledge of the language. Consequently, they tend to perform well in tasks that target metalinguistic knowledge, but performance in real time is a difficult process for them (R. Ellis, 2005). Heritage speakers also have limited meaningful exposure to the language, but their exposure is mostly aural in informal settings with family, relatives and their Spanish speaking community. They do not have significant experience writing or reading the heritage language, so typically they are not literate in the heritage language and, therefore, do not have metalinguistic knowledge of the language (Montrul, 2008b, 2016). Because their experience with the language is mostly aural, they tend to perform better in aural tasks that tap on implicit knowledge, or on intuitive information (Bowles, 2011a; Montrul et al., 2008a; Montrul & Perpiñán, 2011). Based on this typical language experience, it was predicted that L2 learners would perform better in the written modality and HL learners in the aural modality.

Results showed that modality affected both groups of learners but with different clauses. HL learners performed significantly better in the aural modality with passive clauses, while L2 learners performed significantly better in the written modality with relative clauses. With the

passive clauses the HL learners' mean accuracy scores were above chance, this means that in average they comprehended the passive clauses better than the L2 learners did. Thus, if the L2 learners had little or no knowledge of the passive clauses, a modality effect would not be expected. With the relative clauses it was the opposite. HL learners' mean accuracy scores were above 80 % for both modalities, which meant that they had good knowledge of these clauses and modality did not affect it. L2 learners, on the contrary, showed a ranged of comprehension levels that varied with proficiency, and their knowledge was best shown in the written modality. This information suggests that with structures that are challenging for learners, learners are relying on what best suits them, the skills that they know best. Thus, passive clauses were challenging for HL learners and they used their oral skills to serve them in the comprehension of theses clauses. This effect was not seen with L2 learners because there was no challenge, L2 learners were just not familiar with the differences between the passive clauses. They were well below chance in the comprehension of verbal passive clauses. Relative clauses on the other hand, were not as challenging for HL learners as they were for L2 learners, and it was with these clauses that L2 learners performed significantly better in the written modality. Consistent with typical language acquisition and development in which oral language experience precedes written language experience, these results suggest that previous oral language experience predicts success with structures common in written language. This empirical question could be further investigated in a longitudinal study with children who are learning Spanish as a second language, or in a cross-sectional study with adult L2 learners who learned Spanish as a second language in elementary school. In sum, as previous studies have found, modality affects L2 learners and HL learners' comprehension of complex clauses.

This thesis also focused on how instruction interacted with age of meaningful exposure in the acquisition of complex syntax. Relative and passive clauses emerge early in the acquisition process, but are mastered later with schooling, and passive clauses are mastered after exposure to written language. Verbal passive clauses are most frequently used in written modality and verbal passive clauses with the copula in the imperfect tense are not likely to be taught in the classroom.

When HL learners enroll in high school or college HL courses to reacquaintance themselves with the language they typically join L2 learners in the classroom. Studies have shown that formal instruction helps HL learners in the acquisition of grammatical constructions (Bowles & Montrul, 2008; Montrul & Bowles, 2010; Potowski et al., 2009). To explore how instruction in Spanish as an L2 or HL affected comprehension of these clauses this study looked at instruction in general. Instruction was operationalized as Spanish courses taken from pre-school to college and graduate school if applicable. Because relative clauses are more common in the input than verbal passive clauses in the imperfect tense, Spanish courses in general were expected to predict comprehension of relative clauses, and adjectival passive clauses better than comprehension of verbal passive clauses, especially for L2 learners. Results showed that instruction significantly accounted for L2 learners' comprehension of passive clauses, but not for comprehension of relative clauses. Instruction did not account for HL learners' comprehension of any of the clauses.

These results are consistent with the fact that L2 learners have received more education in Spanish than the HL learners. But instruction effects cannot be discarded for HL learners. A look at instruction and reported use of Spanish by parents, and by HL learners showed that early instruction in the HL appears to bolster comprehension of the verbal passive clauses.

A direct and expected consequence of Spanish instruction is reaching higher proficiency in the Spanish language. Thus, it was also important to verify the effects of instruction and proficiency attained in Spanish in the acquisition and development of these clauses in the two groups of learners. This indicated the importance of Spanish instruction in the acquisition of these clauses. Four proficiency measures were collected, DELE (as the written proficiency measure) and MATTR, MLU and fluency as the oral proficiency measures. Proficiency in DELE and in MLU accounted for HL learners' comprehension of passive clauses and relative clauses. None of the proficiency measures accounted for L2 learners' performance with passive clauses because they have not learned them yet, but proficiency in DELE and MATTR accounted for their performance with relative clauses.

This research showed that age of meaningful exposure to Spanish gives HL learners an advantage in the comprehension of structures that involve complex syntax: structures that although acquired early are developed at a later age with formal literacy instruction. Spanish speaking children growing up in a Spanish-speaking country acquire verbal passive clauses with non-reversible contexts (like the ones used in this study) by age 3, but comprehension of these clauses in unstable at least until ages 5 to 6 (Pierce, 1992). For most HL learners in the US literacy begins in English at age 5. It is remarkable that as adults and having received little education in Spanish, HL learners manage to comprehend clauses that are mastered during the school age years. This indicates that they not only have basic knowledge of Spanish basic grammar areas, but are also able to put together their knowledge of the language to understand linguistic complexities. However, HL learners' accuracy in the comprehension of these clauses

was not at ceiling which indicates that these clauses have undergone attrition or were incompletely acquired. This remains an empirical question.

Results from L2 learners inform us of the importance of increasing proficiency levels as they pursue their Spanish language education, and also highlight the relevance of learning a second language at an early age, which is uncommon in the U.S. where public schools introduce a foreign language in middle school or later. Results also suggested that instruction in Spanish is more fruitful for HL learners if imparted in elementary school.

Additionally, results from this study underscores the importance of using two modalities to evaluate HL and L2 learners' proficiency in a research and in a classroom setting. By limiting the evaluation tasks to either the oral or the written modality, researchers and instructors are biased towards performance of one group of learners. Regarding comprehension of relative and passive clauses, this study found that knowledge of relative clauses was accounted for by L2 learners' instruction and proficiency, but not the knowledge of passive clauses with the copula in the imperfect tense. Given their rarity in the input, these passive clauses should be the focus of targeted instruction for both groups of learners, the same could be said about subject relative clauses with SOV word order.

A number of caveats in this dissertation include inclusion of a few participants who met the basic criteria, but who showed little knowledge of the copulas or verbal inflectional morphology in the GJT. In addition, the way instruction was collected should have included learners' reading experience, what kind of texts/genres they read, oral presentations in the L2/HL language, formal writing essays that they remember having written or experience in essay writing. And finally, there was no measure of working memory in this design, which could have helped in interpreting results for HL learners.

CHAPTER 8: CONCLUSION

This study advanced our understanding of age effects and quality and quantity of input in second and heritage language acquisition by showing that age confers advantage to HL learners in the comprehension passive clauses and relative clauses, grammatical structures typical of later language development.

In the case of relative clauses, if the meaningful exposure to Spanish started later in life, proficiency in the language is the determining factor for successful comprehension. Problems in the comprehension of relative clauses start to fade as proficiency increases. HL and L2 learners are able to integrate inflectional morphology and correctly fill object gaps in the comprehension of OR (OVS) clauses. This is possible because this structure is very frequent in the input, there are only two ways to produce the object relative clause in Spanish, knowledge of very clear grammar areas (i.e. inflectional morphology, word order) are involved, and because the structure is used in informal and formal registers. Further research is needed to find out whether these learners are able to integrate the prosody-induced factors and the TOPICFIRST constraints in the comprehension and production of these clauses, something that crucially has to be investigated with advanced or near-native learners.

In the case of passive clauses, findings show that age of meaningful exposure confers advantage to HL learners, especially those who have had early and rich heritage language experience, in the comprehension of verbal passive clauses with the copula in the imperfect tense, *era*. It is noteworthy that the advantage appears to come not only from exposure to Spanish at an early age, but also from the meaningful language input and output experiences during HL learners' childhood. L2 learners, even those who have reached advanced proficiency, failed to comprehend the verbal passive clause and remain non-convergent with this clause. This failure could be explained by the fact that in Spanish there are other common ways to remove the agent

from a sentence, such as, among others, the morphological passive or *se*-passive. Moreover, L2 learners struggle to learn and understand all the intricacies of the two Spanish copulas' grammar and use, and L2 instructors struggle to teach them (Montrul, 2008a). This means that L2 learners and, to that effect, HL learners in the same classroom are not taught in detail the complementary distribution of the copulas in grammar constructions.

Findings also indicate that when listening or reading structures that involve complex syntax learners tend to parse assigning the simpler interpretation. This tendency is inversely related with proficiency. Learners performed better with adjectival passive clauses, and with relative clauses with word order that resembled that of English. Regarding relative clauses, learners who are familiar with verbal inflectional morphology show that they misinterpreted object relative clauses OVS in Spanish as a subject relative SVO because they were not able to use the inflectional morphology that indicated the subject, and filled the subject gap, a simpler way to parse the sentence. This misinterpretation disappeared as HL/L2 proficiency increased.

This study also confirmed what have been found in other studies, that HL and L2 learners' linguistic performance varies per modality of task (i.e. written or oral) especially with clauses that are challenging for them. Moreover, findings suggest that performance in two modalities can show the development of clauses with complex syntax in L2 or HL learners. It seems that if learners have indeed integrated a structure with complex syntax into their grammar, modality will not affect comprehension of that structure. And, if learners have not integrated a structure with complex syntax into their grammar at all, modality will not affect comprehension of such structures either. Thus, the modality effect, at least with complex syntax, seems to be attached to the structure being studied. Modality of tasks, therefore, is a resource that can be used

to reveal the underlying knowledge of L2/HL learners by showing in what developmental sequence the learners are at the time of testing with regards to a particular structure. Developmental readiness in an aspect of language is not necessarily a function of proficiency in the L2 or HL, but it could be. As results in this study show. Thus, to obtain a complete picture of the learners' grammar, tasks should be administered in the two modalities as long as the modality itself is not an experimental variable.

Instruction in Spanish accounted for L2 learners' comprehension of relative clauses. And findings suggest that for HL learners early Spanish instruction, in elementary school, could account for the comprehension of verbal passive clauses. In this respect this dissertation raises the question of how to best measure instruction as a variable in the acquisition of a second or heritage language.

The focus on structures of later language development at different proficiency levels, and on how different factors involved in the language experience shape the process of language acquisition are relevant not only for theory, but also for practical purposes. Understanding how type and amount of exposure to Spanish affect linguistic knowledge acquired will hopefully contribute to the implementation of successful pedagogical policies and practices in the United States that strive to preserve and foster education in the minority language. Understanding the knowledge these learners bring to the classroom will help figuring out what are the best classroom practices that facilitate acquisition of these structures, and understanding their knowledge of complex syntax would be especially helpful for speakers whose goal is to develop their language skills in all registers and in the four language skills.

CHAPTER 9: REFERENCES

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Appendix A Bilingual Language Questionnaire

Bilingual Background Questionnaire
(This information will be kept confidential)

Participant research ID number: _____

Age: _____

I. Personal Data

What is your highest level of education completed? (Please circle.):

some high school high school/GED some college college graduate

What do you do for a living? _____

If college graduate, what is your undergraduate major? _____

Any other studies (Technical Degree, Professional Degree, Master's, PhD, etc.)
_____

Country of origin: _____

Country of current residence:_____

1. If you were not born in the U.S., during what ages did you live in your country of origin?

2. If you were not born in the U.S., how long have you lived in the U.S. for?

****

II. Family History

3. Where are your parents/caregivers from?

Mother: _____ Father: _____

4. What languages do your parents/caregivers speak?

Mother: _____ Father: _____

5. What do your parents do for a living?

Mother: _____ Father: _____

6. What is your parents' highest level of schooling? (circle one for each)

Mother		Father:	
	elementary school		elementary school
	Middle school		middle school
	High school		high school
	College		college
	Grad school		grad school

****

III. Your Linguistic History

7. At what age did you first begin to learn English?

8. At what age did you first begin to learn Spanish?

9. Did you begin to speak both English and Spanish before age 5? (circle one)

Yes No

10. What languages did you <u>hear</u> in your home between the ages of birth-5 years? (circle all those that apply)

Spanish English Mixed Other (specify) _____

11. What languages did your parents/caregivers use mostly when speaking to you?

Spanish English Mixed Both Other

12. What languages did you use mostly when speaking to your parents/caregivers?

Spanish English Mixed Both Other

13. Do you have siblings? Yes No

13 a. How many siblings do you have?

13 b. Are they older or younger?

14. What language/s did you use when speaking with your siblings?

Spanish English Mixed Both Other

15. What language/s did your siblings use when speaking with you?

Spanish English Mixed Both Other

16. Did grandparents live at home?

Yes No

17. What language/s did your grandparents use when speaking to you?

Spanish English Mixed Both Other

18. What language/s did you use when speaking with your grandparents?

Spanish English Mixed Both Other

19. Where there other caregivers in the house (baby-sitter/ other family member)?

Yes No Who?

20. What language/s did your other caregiver use when speaking to you?

Spanish English Mixed Both Other

21. What language/s did you use when speaking to your other caregiver?

Spanish English Mixed Both Other

22. Did you attend daycare or were you cared at home before age 5?

Daycare home with _____

23. What language were you spoken to when in day care/home care?

Spanish English Mixed Both Other

24. What language/s did you use when speaking with your caregiver?

Spanish English Mixed Both Other

25. Did you play with other Spanish-speaking children?

Yes No

26. What languages did you use with other children/siblings?

Spanish English Mixed Both Other

27. Did you watch TV in Spanish?

Yes No

28. Did your parents encourage you to speak Spanish as much as possible in the house?

Yes No

29. Did your parents read stories in Spanish to you?

Yes No

30. Did your parents correct you when you spoke Spanish?
Yes No

****

IV. Elementary School

31. How often did you use Spanish between the ages 6-10?

always often seldom never

32. Who did you speak Spanish with?

mother/father siblings friends others

33. Did you attend elementary school in the US?

Yes No

34. Was English the primary language of instruction?

Yes No

35. Did you have Spanish as a foreign/second language in elementary school?

Yes No

36. How many hours a week of Spanish did you have in elementary school?

2 hours 5 hours 10 hours more than 10

37. Did you have Spanish-speaking friends at school?

Yes No

38. What language did you speak with your Spanish-speaking friends in elementary school?

Spanish English Mixed Both

V. Middle School

39. How often did you use Spanish between the ages 11-13?

always often seldom never

40. Who did you speak Spanish with?

mother/father siblings friends others

41. Did you attend middle school in the US?

Yes No

42. Was English the primary language of instruction?

Yes No

43. Did you have Spanish as a foreign/second language in middle school?

Yes No

44. How many hours a week of Spanish did you have in middle school?

2 hours 5 hours 10 hours more than 10 hours

45. Did you have Spanish-speaking friends in middle school?

Yes No

46. What language did you speak with your Spanish-speaking friends in middle school?

Spanish English Both

****

VI. High School

47. How often did you use Spanish between the ages 13-17?

always often seldom never

48. Who did you speak Spanish with?

mother/father siblings friends others

49. Did you attend high school in the US?

Yes No

50. Was English the language of instruction?

Yes No

51. Did you have Spanish as a foreign/second language in high school?

Yes No

52. How many hours a week of Spanish did you have in high school?

2 hours 5 hours 10 hours more than 10 hours

53. Did you have Spanish-speaking friends in high school?

Yes No

54. What language did you speak with your Spanish-speaking friends in high school?

Spanish English Mixed Both

55. Did you travel to a Spanish-speaking countries?

Where When How long How often

****

VII. Your linguistic proficiency now

56. Rate your current overall language ability in ENGLISH

1 = understand but cannot speak
2 = understand and can speak with great difficulty
3 = understand and speak but with some difficulty
4 = understand and speak comfortably, with little difficulty
5 = understand and speak fluently like a native speaker

57. Rate your current overall language ability in SPANISH

1 = understand but cannot speak
2 = understand and can speak with great difficulty
3 = understand and speak but with some difficulty
4 = understand and speak comfortably, with little difficulty
5 = understand and speak fluently like a native speaker

58. On a scale from 1 to 5, rate your abilities in English and in Spanish
(1 =poor; 2= needs work; 3=good; 4= very good; 5= native speaker command)

English	Reading =	Speaking=	Listening=	Writing=
Spanish	Reading =	Speaking=	Listening=	Writing=

59. In general, as a young adult, which language do you prefer to use? (circle one)

English Spanish It depends Both

on whom I talk to

60. Do you feel Spanish is your native language or like a second language?

Native language second language

****

VIII.

61. Would you like to improve your Spanish language skills?

Yes No Why?

62. What would you like to improve about your Spanish language ability?

63. How is Spanish important for you?

64. Do you think it is important to maintain and improve Spanish in your life?

65. How do you think you can use more Spanish in your future?

66. What was your undergraduate major?

67. Have you lived in a Spanish speaking country? For how long?

68. Please try to remember and list all the Spanish classes you have taken and indicate on a scale of 1 to 7 how much it helped you in your Spanish language development. A score of 1 means the course did not help you at all, a score of 7 means it helped you greatly.

Ex. **Spanish writing - 7 –school - this course helped me a lot.**
Conversational Spanish – summer camp – 4, I did learn one thing or two, not that much.

Elementary school:

Middle School:

High School:

College:

Other classes:

****

VIII. Notes:

Appendix B Written Proficiency (DELE) Test

Multiple Choice Test

Each of the following sentences contains a blank indicating that a word or phrase has been omitted. Select the choice that best completes the sentence.

1. Al oír del accidente de su buen amigo, Paco se puso _____.

a. alegre b. fatigado c. hambriento d. desconsolado

2. No puedo comprarlo porque me_____ dinero.

a. falta b. dan c. presta d. regalan

3. Tuvo que guardar cama por estar _____.

a. enfermo b. vestido c. ocupado d. parado

4. Aquí está tu café, Juanito. No te quemes, que está muy _____.

a. dulce b. amargo c. agrio d. caliente

5. Al romper los anteojos, Juan se asustó porque no podía _____ sin ellos.

a. discurrir b. oír c. ver d. entender

6. ¡Pobrecita! Está resfriada y no puede _____.

a. salir de casa b. recibir cartas c. respirar con pena d. leer las noticias

7. Era una noche oscura sin _____.

a. estrellas b. camas c. lágrimas d. nubes

8. Cuando don Carlos salió de su casa, saludó a un amigo suyo: -Buenos días,____.

a. ¿Qué va? b. ¿Cómo es? c. ¿Quién es? d. ¿Qué tal?

9. ¡Qué ruido había con los gritos de los niños y el _____ de los perros!

a. olor b. sueño c. hambre d. ladrar

10. Para saber la hora, don Juan miró el _____.

a. calendario b. bolsillo c. estante d. despertador

11. Yo, que comprendo poco de mecánica, sé que el auto no puede funcionar sin _.

a. permiso b. comer c. aceite d. bocina

12. Nos dijo mamá que era hora de comer y por eso _____.

a. fuimos a nadar b. tomamos asiento c. comenzamos a fumar
d. nos acostamos pronto

13. ¡Cuidado con ese cuchillo o vas a _____ el dedo!

a. cortarte b. torcerte c. comerte d. quemarte

14. Tuvo tanto miedo de caerse que se negó a _____ con nosotros.

a. almorzar b. charlar c. cantar d. patinar

15. Abrió la ventana y miró: en efecto, grandes lenguas de _____ salían llameando de las casas.

a. zorros b. serpientes c. cuero d. fuego

16. Compró ejemplares de todos los diarios pero en vano. No halló _____.

a. los diez centavos b. el periódico perdido c. la noticia que deseaba
d. los ejemplos

17. Por varias semanas acudieron colegas del difunto profesor a _____ el dolor de la viuda.

a. aliviar b. dulcificar c. embromar d. estorbar

18. Sus amigos pudieron haberlo salvado pero lo dejaron _____.

a. ganar b. parecer c. perecer d. acabar

19. Al salir de la misa me sentía tan caritativo que no pude menos que _____ a un pobre mendigo que había allí sentado.

a. pegarle b. darle una limosna c. echar una mirada d. maldecir

20. Al lado de la Plaza de Armas había dos limosneros pidiendo _____.

a. pedazos b. paz c. monedas d. escopetas

21. Siempre maltratado por los niños, el perro no podía acostumbrarse a _____ de sus nuevos amos.

a. las caricias b. los engaños c. las locuras d. los golpes

22. ¿Dónde estará mi cartera? La dejé aquí mismo hace poco y parece que el necio de mi hermano ha vuelto a _____.

a. dejármela b. deshacérmela c. escondérmela d. acabármela

23. Permaneció un gran rato abstraído, los ojos clavados en el fogón y el pensamiento ___.

a. en el bolsillo b. en el fuego c. lleno de alboroto d. Dios sabe dónde

24. En vez de dirigir el tráfico estabas charlando, así que tú mismo _____ del choque.

a. sabes la gravedad b. eres testigo c. tuviste la culpa
d. conociste a las víctimas

25. Posee esta tierra un clima tan propio para la agricultura como para _____.

a. la construcción de trampas b. el fomento de motines c. el costo de vida
d. la cría de reses

26. Aficionado leal de obras teatrales, Juan se entristeció al saber _____ del gran actor.

a. del fallecimiento b. del éxito c. de la buena suerte d. de la alabanza

27. Se reunieron a menudo para efectuar un tratado pero no pudieron _____.

a. desavenirse b. echarlo a un lado c. rechazarlo d. llevarlo a cabo

28. Se negaron a embarcarse porque tenían miedo de _____.

a. los peces b. los naufragios c. los faros d. las playas

29. La mujer no aprobó el cambió de domicilio pues no le gustaba _____.

a. el callejeo b. el puente c. esa estación d. aquel barrio

30. Era el único que tenía algo que comer pero se negó a _____.

a. hojearlo b. ponérselo c. conservarlo d. repartirlo

Cloze Test

In the following text, some of the words have been replaced by blanks numbered 1 through 20. First, read the complete text in order to understand it. Then reread it and choose the correct word to fill each blank from the answer sheet. Mark your answers by circling your choice on the answer sheet, not by filling in the blanks in the text.

El sueño de Joan Miró

Hoy se inaugura en Palma de Mallorca la Fundación y Joan Miró, en el mismo lugar en donde el artista vivió sus últimos treinta y cinco años. El sueño de Joan Miró se ha _____ _____ (1). Los fondos donados a la ciudad por el pintor y su esposa en 1981 permitieron que el sueño se _____(2); más tarde, en 1986, el Ayuntamiento de Palma de Mallorca decidió _____(3) al arquitecto Rafael Moneo un edificio que _____ _____(4) a la vez como sede de la entidad y como museo moderno. El proyecto ha tenido que _ _____(5) múltiples obstáculos de carácter administrativo. Miró, coincidiendo ___ _____(6) los deseos de toda su familia, quiso que su obra no quedara expuesta en ampulosos panteones de arte o en _____(7) de coleccionistas acaudalados; por ello, en 1981, creó la fundación mallorquina. Y cuando estaba _____(8) punto de morir, donó terrenos y edificios, así como las obras de arte que en ellos _____(9).

El edificio que ha construido Rafael Moneo se enmarca en _____(10) se denomina "Territorio Miró", espacio en el que se han _____(11) de situar los distintos edificios que constituyen la herencia del pintor.

El acceso a los mismos quedará _____ (12) para evitar el deterioro de las obras. Por otra parte, se _____(13), en los talleres de grabado y litografía, cursos __ _____(14) las distintas técnicas de estampación. Estos talleres también se cederán periódicamente a distintos artistas contemporáneos, _____(15) se busca que el "Territorio Miró" _____(16) un centro vivo de creación y difusión del arte a todos los _____(17).

La entrada costará 500 pesetas y las previsiones dadas a conocer ayer aspiran _____(18) que el centro acoja a unos 150.000 visitantes al año. Los responsables esperan que la institución funcione a _____(19) rendimiento a principios de la _____ _____ (20) semana, si bien el catálogo completo de las obras de la Fundación Pilar y Joan Miró no estará listo hasta dentro de dos años.

Appendix C Oral Narrative

Little Red Riding Hood – Slides for oral narrative

Story Retelling Task

1

Instructions

- In this task you will see 14 slides narrating a famous children's story.
- Your task is to retell the story, with as much detail as possible, in Spanish.
- Please tell the story in the PAST
- Pay attention! The end might surprise you.
- Your story will be audio-recorded.

2

Instrucciones

- En este test Ud. Verá 14 diapositivas que narran un cuento de niños famoso.
- Narre la historia en el PASADO.
- Preste atención! El final puede ser inesperado.
- Sus respuestas serán grabadas en audio.

3

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Appendix D SALT Software Analysis of Oral Narrative

The following information is from SALT software student version 16-7.

MATTR	"Moving-Average TTR- the moving-average type–token ratio (Covington, M. A., &McFall, J. D. (2010). Cutting the Gordian knot: The moving-average type–token ratio (MATTR). Journal of Quantitative Linguistics, 17, 94–100) estimates TTR using a moving window. Initially, a window length is selected, e.g., 100 words, and the TTR for words 1–100 is calculated. Then the TTR is calculated for words 2–101, then 3–102, and so on to the end of the sample. For the final score, the individual TTRs are averaged. The window size is displayed in parentheses following the score. The default window size is 100 but it may be changed by selecting "Setup menu -->Analysis Settings -->MATTR Window Size". All words used to calculate NTW are included in this calculation. If the default window size is greater than NTW, the window size is changed to equal NTW."
MLU in Words	"The ratio of the number of main body words to the number of utterances. Each word counts as one word for this calculation regardless of how many bound morphemes it may contain. This calculation excludes all omitted words and all words located in mazes."
Fluency	"Words/Minute: the ratio of "All Words Produced" to the elapsed time, either actual or estimated, in minutes. Part words are not included in the total words used to calculate rate."
Errors	"% Utterances with Errors- percent of utterances in the current analysis set which contain omissions or error codes."

Appendix E Sentences in Grammaticality Judgment Task - GJT

Relative Clauses

Verbal Inflectional morphology - Grammatical

1. La camioneta remolcó los coches	The truck towed the cars.
2. Los coches remolcaron la camioneta	The cars towed the truck.
3. El submarino hundió los barcos	The submarine sank the boats.
4. Los barcos hundieron el submarino.	The boats sank the submarine.
5. La casa tapó los letreros.	The house covered the billboards.
6. Los letreros taparon la casa.	The billboards covered the house.
7. La palma tumbó los postes.	The palm tree knocked down the light-posts.
8. Los postes tumbaron la palma.	The light poles knocked down the palm trees.
9. El libro cubrió las revistas.	The book covered the magazines.
10. Las revistas cubrieron el libro.	The magazines covered the book.
11. El porton abolló los coches.	The gate dented the cars.
12. Los coches abollaron el portón.	The cars dented the gate.
13. El carro arrastró los papalotes.	The car dragged the kites.
14. Los papalotes arrastraron el carro.	The kites dragged the car.
15. El camión transportó los helicópteros.	The truck transported the helicopter.
16. Los helicópteros transportaron el camión.	The helicopters transported the truck.
17. El rodillo manchó las brochas.	The rod stained the brushes.
18. Las brochas mancharon el rodillo.	The brushes stained the rod.
19. El avión destruyó los misiles.	The airplane destroyed the missiles.
20. Los misiles destruyeron el avión.	The missiles destroyed the airplane.
21. La cama ocultó los anaqueles.	The bed hid the shelves.
22. Los estantes ocultaron la cama.	The shelves hid the bed.
23. El robot destruyó las naves.	The robot destroyed the ships.
24. Las naves destruyeron el robot.	The ships destroyed the robot.
25. La canoa volcó las balsas.	The canoe turned over the rafts.
26. Las balsas volcaron la canoa.	The rafts turned over the canoe.

Verbal Inflectional Morphology - Ungrammatical

1.*El piano aplastaron el sofá.	*The piano smashed$_{plural}$ the sofa.
2. *Los pianos aplastó los sofás.	*The pianos smashed$_{singular}$ the sofas.
3. *La puerta quebraron la motocicleta.	*The door broke$_{plural}$ the motorcycle.
4. *Las puertas quebró las motocicletas.	*The doors broke$_{singular}$ the motorcycles.
5. *La balsa llevaron el tronco.	*The raft carried$_{plural}$ the log.
6. *Las balsas llevó los troncos.	*The rafts carried$_{singular}$ the logs.
7. *La puerta estropearon la ventana.	*The door damaged$_{plural}$ the window.
8. *Las puertas estropeó las ventanas.	*The doors damaged$_{singular}$ the windows.
9. *El tren chocaron el coche.	*The train crashed$_{plural}$ into the car.
10. *Los trenes chocó los choches.	*The trains crashed$_{singular}$ into the cars.
11. *El platillo derribaron el avión.	*The flying saucer took down$_{plural}$ the airplane.
12. *Los platillos destruyó los aviones.	*The flying saucers took down$_{singular}$ the airplanes.
13. *La escalera rompieron el aspa.	*The ladder broke$_{plural}$ the blade.
14. *Las escaleras rompió las aspas.	*The ladders broke$_{singular}$ the blades.
15. *El helicóptero levantaron la grúa.	*The helicopter lifted $_{plural}$ the crane.
16. *Los helicópteros levantó las grúas.	* The helicopters lifted$_{singular}$ the cranes.
17. *El poste rompieron el coco.	*The pole broke $_{plural}$ the coconut.
18. *Los postes rompió los cocos.	* The poles broke$_{singular}$ the coconuts.
19. *La moto rebasaron el carro.	*The motorcycle passed $_{plural}$ the car.
20. *Las motos rebasó los carros.	* The motorcycles passed$_{singular}$ the cars.
21. *La manguera mojaron el aspersor.	*The hose splashed $_{plural}$ the sprinkler.
22. *Las mangueras mojó los aspersores.	* The hoses splashed$_{singular}$ the sprinklers.
23. *La lancha rompieron la roca.	*The boat broke $_{plural}$ the rock.
24. *Las rocas rompió las lanchas.	*The boats broke$_{singular}$ the rocks.
25. *La escalera rompieron la rama.	*The ladder broke $_{plural}$ the branch.
26. *Las ramas rompió las escaleras.	* The ladders broke$_{singular}$ the branches.

Inversion in questions - Grammatical

¿Remolcó los coches la camioneta?	The truck towed the cars?
¿Remolcaron los coches la camioneta?	The cars towed the truck?
¿Hundió los barcos el submarino?	The submarine sank the boats?
¿Hundieron los barcos el submarino?	The boats sank the submarine?
¿Tapó los letreros la casa?	The house covered the billboards?
¿Taparon los letreros la casa?	The billboards covered the house?
¿Tumbó los postes la palma?	The palm tree knockdown the light posts?
¿Tumbaron los postes la palma?	The light poles knocked down the palm tree?
¿Cubrió las revistas el libro?	The book covered the magazines?
¿Cubrieron las revistas el libro?	The magazines covered the books?
¿Abolló los coches el portón?	The gate dented the cars?
¿Abollaron los coches el portón?	The cars dented the gate?
¿Arrastró los papalotes el carro?	The cars dragged the kite?
¿Arrastraron los papalotes el carro?	The kites dragged the car?
¿Transportó los helicópteros el camión?	The truck transported the helicopters?
¿Transportaron los helicópteros el camión?	The helicopter transported the trucks?
¿Manchó las brochas el rodillo?	The rod stained the brushes?
¿Mancharon las brochas el rodillo?	The brushes stained the rod?
¿Destruyó los misiles el avión?	The airplane destroyed the missiles?
¿Destruyeron los misiles el avión?	The missiles destroyed the airplane?
¿Ocultó los anaqueles la cama?	The bed hid the shelves?
¿Ocultaron los anaqueles la cama?	The shelves hid the bed?

Ungrammatical sentences with inversion

*¿Aplastó los pianos los sofás?	*Smashed$_{singular}$ the pianos the sofas?
*¿Aplastaron el piano el sofá?	*Smashed$_{plural}$ the piano the sofa?
*¿Quebró las puertas las motocicletas?	*Broke$_{singular}$ the doors the motorcycles?
*¿Quebraron la motocicleta la puerta?	*Broke$_{plural}$ the door the motorcycle?
*¿Llevó las balsas los troncos?	*Carried$_{singular}$ the rafts the logs?
*¿Llevaron el tronco la balsa?	*Carried$_{plural}$ the raft the log?
*¿Estropeó las puertas las ventanas?	*Damaged$_{singular}$ the doors the windows?
*¿Estropearon la ventana la puerta?	*Damaged$_{plural}$ the door the window?
*¿Chocó los trenes los coches?	*Crashed$_{singular}$ into the trains the cars?
*¿Chocaron el coche el tren?	*Crashed$_{plural}$ into the train the car?
*¿Derribó los platillos los aviones?	*Destroyed$_{singular}$ the flying saucers the airplanes?
*¿Derribaron el avión el platillo?	*Destroyed$_{plural}$ the flying saucer the airplane?
*¿Rompió las aspas las escaleras?	*Broke$_{singular}$ the blades the ladders?
*¿Levantó las grúas los helicópteros?	*Lifted $_{singular}$ the cranes the helicopters?
*¿Rebasó los carros las motocicletas?	*Overtook the cares the motorcycles?
*¿Rompieron el aspa la escalera?	*Broke $_{plural}$ the blade the ladder?
*¿Levantaron la grúa el helicóptero?	*Lifted $_{plural}$ the crane the helicopter?
*¿Rebasaron el carro la motocicleta?	*Overtook $_{plural}$ the car the motorcycle?
*¿Volcaron la balsa la canoa?	*¿Tipped over $_{plural}$ the raft the canoe?

¿Mojó los aspersores las mangueras?	*Splashed $_{singular}$ the sprinklers the hoses?
¿Rompió las lanchas las rocas?	*Broke $_{singular}$ the boats the rocks?
¿Rompió las ramas las escaleras?	* Broke $_{singular}$ the branches the ladders?
¿Volcó las balsas las canoas?	*Tipped over $_{singular}$ the rafts the canoes?
¿Mojaron el aspersor la manguera?	*Splashed $_{plural}$ the sprinklers the hoses?
¿Rompieron la lancha la roca?	*Broke$_{plural}$ the boat the rock?
¿Rompieron la rama la escalera?	*Broke $_{plural}$ the branch the ladder?

Passive Clauses

Grammatical (correct imperfect tense of 'to be' – *era*)

1. La cena era servida por los meseros.
   Dinner was being served by the waiters.
2. El paciente era medicado por los médicos.
   The patient was being medicated by the doctors.
3. La cortina era colgada por la diseñadora.
   The curtain was being hung by the designer.
4. El carro era vandalizado por los delincuentes.
   The car was being vandalized by the criminals.
5. La ropa era lavada por las mujeres.
   The clothes were being washed by the women.
6. La chica era peinada por la estilista.
   The young woman was being coiffed by the stylist.
7. El submarino era hundido por los barcos.
   The submarine was being sunk by the boats.
8. El platillo era destruido por los aviones.
   The saucer was being destroyed by the planes.
9. El coche era abollado por los autobuses.
   The car was being dented by the buses.
10. La caja era acomodada por el empleado.
    The box was being placed by the employee.
11. La bicicleta era arreglada por el ciclista.
    The bicycle was being fixed by the cyclist.
12. La puerta era cerrada por los caballeros.
    The door was being closed by the knights.
13. El castillo era construido por los plebeyos.
    The castle was being built by the plebeians.
14. El árbol era adornado por los niños.
    The tree was being decorated by the children.
15. La manzana era picada por el chef.
    The apple was being sliced by the chef.
16. El hombre era maquillado por la chica.
    The man was being 'made up' by the young woman.
17. El cuchillo era amolado por el hombre.
    The knife was being sharpened by the man.
18. La antena era fijada por el marido.
    The antenna was being affixed by the husband.
19. El café era colado por el barista.
    The coffee was being strained by the barista.
20. La carta era escrita por el chico.
    The letter was being written by the young.
21. La solicitud era rellenada por los solicitantes.

The application was being filled out by the applicants.

22. El barro era moldeado por los estudiantes.
    The clay was being shaped by the students.
23. La cenicienta era transformada por el hada madrina.
    Cinderella was being transformed by the fairy godmother.
24. La computadora era ensamblada por el chico.
    The computer was being assembled by the young man.

GJT Passive Clauses –Ungrammatical
(correct form is *era*)
[Same sentences as above, but with the Spanish imperfect tense of the verb *estar*]

1. La cena estaba servida por los meseros.
2. El paciente estaba medicado por los médicos.
3. Las cortinas estaban colgadas por la diseñadora.
4. El carro estaba vandalizado por los delincuentes.
5. La ropa estaba lavada por las mujeres.
6. La chica estaba peinada por la estilista.
7. El submarino estaba hundido por los barcos.
8. El platillo estaba destruido por los aviones.
9. El coche estaba abollado por los autobuses.
10. La caja estaba acomodada por el empleado.
11. La bicicleta estaba arreglada por el ciclista.
12. La puerta estaba cerrada por los caballeros.
13. El castillo estaba construido por los plebeyos.
14. El árbol estaba adornado por los niños.
15. La manzana estaba picada por el chef.
16. El hombre estaba maquillado por la chica.
17. El cuchillo estaba amolado por el hombre.
18. La antena estaba fijada por el marido.
19. El café estaba colado por el barista.
20. La carta estaba escrita por el chico.
21. La solicitud estaba rellenada por los solicitantes.
22. El barro estaba moldeado por los estudiantes.
23. La cenicienta estaba transformada por el hada madrina.
24. La computadora estaba ensamblada por el chico.

Adjectives with *ser* - Grammatical

1. El perro era fiel.	The dog was loyal.
2. La chica era María Pérez.	The young woman was María Pérez
3. La madre era Española.	The mother was Spanish.
4. El hombre era abogado.	The man was an attorney.
5. El joven era estudiante.	The young man was a student.
6. El carro era deportivo.	The car was a sports car.
7. El éxito es posible.	Success is possible.
8. Las remodelaciones eran necesarias.	Remodeling is necessary.
9. El miedo era obvio.	The fear was obvious.
10. La reacción era comprensible.	The reaction was comprehensible.
11. El científico era importante.	The scientist was important.
12. La contribución era indispensable.	The contribution was indispensable.
13. El castigo era injusto.	The punishment was unfair.
14. La intención era otra.	The intention was another one.

Adjectives with *ser* - Ungrammatical (Same sentences as above, but with verb *estar*).

1. El perro estaba fiel.
2. La chica estaba María Pérez.
3. La madre estaba española.
4. El hombre estaba abogado.
5. El joven estaba estudiante.
6. El carro estaba deportivo.
7. El éxito estaba posible.
8. Las remodelaciones estaban necesarias.
9. El miedo estaba obvio.
10. La reacción estaba comprensible.
11. El científico estaba importante.
12. La contribución estaba indispensable.
13. El castigo estaba injusto.
14. La intención estaba otra.

Adjectives with *estar*- Grammatical

1. Juan estaba presente.	Juan was present.
2. La madre estaba cansada	The mother was tired.
3. El estudiante estaba ausente.	The student was absent.
4. El jardinero estaba enfermo.	The gardener was sick.
5. El abuelo estaba muerto.	The grandfather was dead.
6. El hombre estaba desnudo.	The man was naked.
7. La ciudad estaba desierta.	The city was deserted.
8. Las bicicletas estaban rotas.	The bicycles were broken.
9. La gente estaba harta.	People were fed up.
10. El autobús estaba lleno.	The bus was full.
11. El lugar estaba vacío.	The place was empty.
12. La joven estaba embarazda.	The young woman was pregnant.

Adjective with *estar*- Ungrammatical (Same sentences as above, but with verb *ser*)

1. Juan era presente
2. La madre era cansada
3. La esposa era harta
4. La joven era embarazada
5. El abuelo era muerto.
6. El jardinero era enfermo.
7. El hombre era desnudo
8. La ciudad era desierta
9. Las bicicletas eran rotas
10. La gente era harta.
11. El autobús era lleno.
12. El lugar era vacío.

Prepositional phrases with *Estar* - Grammatical

1. El chico estaba en la tienda.	The young man was at the store.
2. El coco estaba en la palma.	The coconut was on the coconut palm.
3. El gato estaba en el sofá.	The cat was on the sofa.
4. El perro estaba en el patio.	The dog was in the backyard.
5. La chica esaba en la tienda.	The young woman was at the store.
6. Las chicas estaban en la tienda.	The young women were at the store.
7. Los chicos estaban en la tienda.	The young men were at the store.
8. Los cocos estaban en la palma.	The coconuts were on the coconut palm.
9. Los gatos estaban en el sofá.	The cats were on the sofa.
10. Los hombres estaban en el trabajo.	The men were at work.
11. Los perros estaban en el patio.	The dogs were in the backyard.
12. La mujer estaba en el trabajo.	The woman was at work.

Prepositional phrases with *Estar* – Ungrammatical (same as *Estar*-Grammatical, but with *era*)

13. El chico era en la tienda.
14. El coco era en la palma.
15. El gato era en el sofá.
16. El perro era en el patio.
17. La chica era en la tienda.
18. Las chicas eran en la tienda.
19. Los chicos eran en la tienda.
20. Los cocos eran en la palma. .
21. Los gatos eran en el sofá.
22. Los hombres eran en el trabajo.
23. Los perros eran en el patio.
24. La mujer era en el trabajo.

Prepositional phrases with *Ser*- Grammatical

1. La torre era de piedra.	The tower was made out of stone.
2. La chica era de México.	The young woman was from Mexico.
3. El parapente era de plástico.	The paraglider was made out of plastic.
4. Los cocos eran de Puerto Rico.	The coconuts were from Puerto Rico.
5. Los helicópteros eran del ejército.	The helicopters were from the military.
6. Las camisas eran de Marta.	The shirts were Maria's.
7. Las gafas eran de la abuela.	It was Grandmother's sunglasses.
8. Los médicos eran de Costa Rica.	The doctors were from Costa Rica.
9. Los bates eran del chico.	It was the young man's bats.
10. El bate era de madera.	The bat was made out of wood.
11. La bicicleta era de Ramón.	The bicycle was Ramón's.
12. El submarino era de titanio.	The submarine was made out of titanium.

Prepositional phrases with *Ser*- Ungrammatical (same as *Ser*- Grammatical but with *estar*)

1. La torre estaba de piedra.
2. La chica estaba de México.
3. El parapente estaba de plástico.
4. Los cocos eran de Puerto Rico.
5. Los helicópteros estaban del ejército.
6. Las camisas estaban de Marta.
7. Las gafas estaban de la abuela.
8. Los médicos estaban de Costa Rica.
9. Los bates estaban del chico.
10. El bate estaba de madera.
11. La bicicleta estaba de Ramón.
12. El submarino estaba de titanio.

Present Progressive - Grammatical

1. El chico estaba trabajando.	The young man was working.
2. La mujer estaba comprando.	The woman was buying.
3. El coche estaba acelerando.	The car was accelerating.
4. Los helicópteros estaban despegando.	The helicopters were taking off.
5. Los chicos estaban comiendo.	The young men were eating.
6. Las personas estaban bailando.	The persons were dancing.
7. El gato estaba maullando.	The cat was meowing.
8. El pájaro estaba volando.	The bird was flying.
9. El avión estaba aterrizando.	The airplane was landing.
10. Los perros estaban jugando.	The dogs were playing.
11. Los médicos estaban trabajando.	The doctors were working.
12. Las niñas estaban estudiando.	The girls were studying.

Present Progressive – Ungrammatical (Same as above but with *ser*)

1. El chico era trabajando.
2. La mujer era comprando.
3. El coche era acelerando.
4. Los helicópteros eran despegando.
5. Los chicos eran comiendo.
6. Las personas eran bailando.
7. El gato era maullando.
8. El pájaro era volando.
9. El avión era aterrizando.
10. Los perros eran jugando.
11. Los médicos eran trabajando.
12. Las niñas eran estudiando.

Passive clauses with canonical past tense – *fue* (Grammatical)

1. El dragón fue quemado por el volcán.	The dragon was burned by the volcano.
2. El platillo fue destruido por los aviones.	The flying saucer was destroyed by the airplanes.
3. El portón fue abollado por los carros.	The gate was dented by the cars.
4. La paciente fue examinada por el médico.	The patient was examined by the doctor.
5. La mujer fue secuestrada por el criminal.	The woman was kidnapped by the criminal.
6. La niña fue castigada por la mamá.	The girl was punished by the mother.
7. La motocicleta fue rebasada por los carros.	The motorcycle was overtaken by the cars.
8. La camioneta fue remolcada por los carros.	The truck was towed by the cars.
9. La mujer fue asesinada por el criminal.	The woman was murdered by the criminal.
10. El barco fue alumbrado por el faro.	The boat was illuminated by the lighthouse.
11. El robot fue destruido por las naves.	The robot was destroyed by the vessels.
12. El helicóptero fue levantado por las grúas.	The helicopter was lifted by the cranes.

Two ungrammatical fillers:

1. ¿Eres buena la ensalada verde?	Are you good the green salad?
2. ¿Yo estuvieron en el cine sola?	I they were at the movie theater alone?

Two grammatical fillers:

1. ¿Las chicas diseñaron el traje?	The young women designed the dress?
2. ¿Alumbraron los faros el barco?	The lighthouses illuminated the boat?

Appendix F Surveygizmo Test

::New Page:: ¿Es probable o no?

Escondieron el avión en la caja de fósforos.
() Es probable | 0
() No es probable | 1

El avión da vueltas encima de la luna.
() Es probable | 0
() No es probable | 1

El viento tumbó los árboles.
() Es probable | 1
() No es probable |0

La sombra del mosquito cubría la casa.
() Es probable | 0
() No es probable | 1

Los cubos de hielo calentaron la bebida.
() Es probable | 0
() No es probable | 1

La canica aplastó el sofá.
() Es probable | 0
() No es probable | 1

La motocicleta derribó el avión.
() Es probable | 0
() No es probable | 1

Los lápices abollaron el submarino.
() Es probable | 0
() No es probable | 1

::New Page:: ¿Es probable o no?

La cena era servida por los meseros.
() Es probable | 1
() No es probable | 0

El paciente era medicado por los médicos.
() Es probable | 1
() No es probable | 0

La camioneta remolcó los coches.
() Es probable | 1
() No es probable | 0

El submarino hundió los barcos.
() Es probable | 1
() No es probable | 0

Las ramas rompieron la escalera.
() Es probable | 1
() No es probable | 0

Las naves destruyeron el robot.
() Es probable | 1
() No es probable | 0

El perro baña a los dueños en el patio.
() Es probable | 0

Los globos alzaron la casa hasta el cielo.
() Es probable | 0

El niño levantó el carro estacionado.
() Es probable | 0

El estadio era destruido por las hormigas.
() Es probable | 0

::New Page:: ¿Es probable o no?

Las cortinas eran colgadas por la diseñadora.
() Es probable | 1
() No es probable | 0

El carro era vandalizado por los delincuentes.
() Es probable | 1
() No es probable | 0

La casa tapó los letreros.
() Es probable | 1
() No es probable | 0

La palma tumbó los postes.
() Es probable | 1
() No es probable | 0

Las balsas volcaron la canoa.
() Es probable | 1
() No es probable | 0

Las rocas rompieron la lancha.
() Es probable | 1
() No es probable | 0

La mosca cubría todas las ventanas de la sala.
() Es probable | 0
() No es probable | 1

El perro habló calmadamente sin ladrar.
() Es probable | 0
() No es probable | 1

La estufa congeló la comida.
() Es probable | 0

() No es probable | 1

El carro era abollado por las plumas.
() Es probable | 0
() No es probable | 1

::New Page:: ¿Es probable o no?

La ropa era lavada por las mujeres.
() Es probable | 1
() No es probable | 0

La chica era peinada por la estilista.
() Es probable | 1
() No es probable | 0

El libro cubrió las revistas.
() Es probable | 1
() No es probable | 0

El portón abolló los coches.
() Es probable | 1
() No es probable | 0

Los coches remolcaron la camioneta.
() Es probable | 1
() No es probable | 0

Los barcos hundieron el submarino.
() Es probable | 1
() No es probable | 0

El libro compró a la chica.
() Es probable | 0
() No es probable | 1

Los barcos volaron sobre el submarino.

() Es probable | 0
() No es probable | 1

La bicicleta rebasó los carros deportivos.

() Es probable | 0
() No es probable | 1

El avion era transportado por las motocicletas.
() Es probable | 0
() No es probable | 1

::New Page:: ¿Es probable o no?

La casa era tapada por el chico.
() Es probable | 1
() No es probable | 0

El submarino era hundido por los barcos.
() Es probable | 1
() No es probable | 0

El carro arrastró los papalotes.
() Es probable | 1
() No es probable | 0

El piano aplastó los sofás.
() Es probable | 1
() No es probable | 0

Los carros rebasaron la motocicleta.
() Es probable | 1

() No es probable | 0

Los aspersores mojaron la manguera.
() Es probable | 1
() No es probable | 0

La luciérnaga pisó al gato.

() Es probable | 0
() No es probable | 1

El dragón quemó al volcán.

() Es probable | 0
() No es probable | 1

La chica vio microbios con el telescopio.
() Es probable | 0
() No es probable | 1

Las zanahorias eran levantadas por las moscas.
() Es probable | 0
() No es probable | 1

::New Page:: ¿Es probable o no?

El platillo era destruido por los aviones.
() Es probable | 1
() No es probable | 0

El coche era abollado por los autobuses.
() Es probable | 1
() No es probable | 0

La puerta que quebró las motocicletas.
() Es probable | 1
() No es probable | 0

La balsa llevó los troncos.
() Es probable | 1
() No es probable | 0

Las grúas levantaron el helicóptero.
() Es probable | 1
() No es probable | 0

Los cocos rompieron el poste.
() Es probable | 1
() No es probable | 0

La hormiga obstruyó la vista del elefante.
() Es probable | 0
() No es probable | 1

La lombriz se comió al pajarito.
() Es probable | 0
() No es probable | 1

El autobús iba más rápido que el avión.
() Es probable | 0
() No es probable | 1

El oso era aplastado por el grano de arroz.
() Es probable | 0
() No es probable | 1

::New Page:: ¿Es probable o no?

La caja era acomodada por el empleado.
() Es probable | 1
() No es probable | 0

La bicicleta era arreglada por el ciclista.
() Es probable | 1
() No es probable | 0

La puerta estropeó las ventanas.
() Es probable | 1
() No es probable | 0

El tren chocó los coches.
() Es probable | 1
() No es probable | 0

Los estantes ocultaron la cama.
() Es probable | 1
() No es probable | 0

Las aspas del helicóptero rompieron la escalera del camión de bomberos.
() Es probable | 1
() No es probable | 0

La madera cortaba el acero.
() Es probable | 0
() No es probable | 1

El bate cortó la tijera.
() Es probable | 0
() No es probable | 1

La burbuja destruyó el platillo volador.
() Es probable | 0
() No es probable | 1

La mesa era destruida por la burbuja.
() Es probable | 0
() No es probable | 1

La guitarra era reparada por las termitas.

() Es probable | 0
() No es probable | 1

::New Page:: ¿Es probable o no?

La puerta era cerrada por los caballeros.
() Es probable | 1
() No es probable | 0

El castillo era construido por los plebeyos.
() Es probable | 1
() No es probable | 0

El platillo derribó los aviones.
() Es probable | 1
() No es probable | 0

El camión transportó los helicópteros.
() Es probable | 1
() No es probable | 0

Las brochas mancharon el rodillo.
() Es probable | 1
() No es probable | 0

Los misiles destruyeron el avión.
() Es probable | 1
() No es probable | 0

Los pájaros hundieron el submarino.
() Es probable | 0
() No es probable | 1

La casita tapó los rascacielos.
() Es probable | 0

() No es probable | 1

El bebé arrastró el tractor.
() Es probable | 0
() No es probable | 1

La casa era derribada por la ardilla.
() Es probable | 0
() No es probable | 1

::New Page:: ¿Es probable o no?

El árbol era adornado por los niños.
() Es probable | 1
() No es probable | 0

La manzana era picada por el chef.
() Es probable | 1
() No es probable | 0

El rodillo manchó las brochas.
() Es probable | 1
() No es probable | 0

El avión destruyó los misiles.
() Es probable | 1
() No es probable | 0

Los letreros taparon la casa.
() Es probable | 1
() No es probable | 0

Los postes tumbaron la palma.
() Es probable | 1
() No es probable | 0

El caracol destruyó la piedra.
() Es probable | 0
() No es probable | 1

El papel quebró el espejo.
() Es probable | 0
() No es probable | 1

La bicicleta remolcó el submarino.
() Es probable | 0
() No es probable | 1

El agua secó la grama.
() Es probable | 0
() No es probable | 1

El policía era arrestado por los delincuentes.
() Es probable | 0
() No es probable | 1

::New Page:: ¿Es probable o no?

El hombre era maquillado por la chica.
() Es probable | 1
() No es probable | 0

El cuchillo era amolado por el hombre.
() Es probable | 1
() No es probable | 0

La cama ocultó los estantes.
() Es probable | 1
() No es probable | 0

La escalera del camión de bomberos rompió las aspas del helicóptero.
() Es probable | 1
() No es probable | 0

Las revistas cubrieron el libro.
() Es probable | 1
() No es probable | 0

Los coches abollaron el portón.
() Es probable | 1
() No es probable | 0

Los granos de arroz aplastaron al oso.
() Es probable | 0
() No es probable | 1

Las toallas rompieron las ventanas.
() Es probable | 0
() No es probable | 1

La mosca levantó las zanahorias.
() Es probable | 0
() No es probable | 1

El niño era amamantado por la planta.
() Es probable | 0
() No es probable | 1

::New Page:: ¿Es probable o no?

La antena era fijada por el marido.
() Es probable | 1
() No es probable | 0

El café era colado por el barista.

() Es probable | 1
() No es probable | 0

El helicóptero levantó las grúas.
() Es probable | 1
() No es probable | 0

El poste rompió los cocos.
() Es probable | 1
() No es probable | 0

Los papalotes arrastraron el carro.
() Es probable | 1
() No es probable | 0

Los sofás aplastaron el piano.
() Es probable | 1
() No es probable | 0

Las motocicletas transportaban un avion.
() Es probable | 1
() No es probable | 1

La flecha derribó los aviones.
() Es probable | 0
() No es probable | 1

Las plumas abollaron el carro.
() Es probable | 0
() No es probable | 1

Los cubos de hielo calentaron la bebida.
() Es probable | 0
() No es probable | 1

La tienda era vigilada por hormigas.
() Es probable | 0

() No es probable | 1

::New Page:: ¿Es probable o no?

El barro era moldeado por los estudiantes.
() Es probable | 1
() No es probable | 0

La cenicienta era transformada por el hada madrina.
() Es probable | 1
() No es probable | 0

La motocicleta rebasó los carros.
() Es probable | 1
() No es probable | 0

La manguera mojó los aspersores.
() Es probable | 1
() No es probable | 0

Las motocicletas quebraron la puerta.
() Es probable | 1
() No es probable | 0

Los troncos llevaron la balsa.
() Es probable | 1
() No es probable | 0

Rompió la ventana con la fresa.
() Es probable | 0
() No es probable | 1

El gatito se ocultó detrás del grano de arroz.
() Es probable | 0
() No es probable | 1

La linterna llenó el estadio de luz.
() Es probable | 0
() No es probable | 1

La canica aplastó el sofá.
() Es probable | 0
() No es probable | 1

El teléfono era robado por el perro.
() Es probable | 0
() No es probable | 1

::New Page:: ¿Es probable o no?

La solicitud era rellenada por los solicitantes.
() Es probable | 1
() No es probable | 0

La computadora era ensamblada por el chico.
() Es probable | 1
() No es probable | 0

La canoa volcó las balsas.

() Es probable | 1
() No es probable | 0

La lancha rompió las rocas.
() Es probable | 1
() No es probable | 0

Las ventanas estropearon la puerta.
() Es probable | 1
() No es probable | 0

Los coches chocaron el tren.

() Es probable | 1
() No es probable | 0

El extintor avivó el fuego.
() Es probable | 0
() No es probable | 1

Cortó el bizcocho con la esponja.
() Es probable | 0
() No es probable | 1

La mariposa voló más rápido que el águila.
() Es probable | 0
() No es probable | 1

La motocicleta derribo el avión.
() Es probable | 0
() No es probable | 1

La gallina era desplumada por el viento.
() Es probable | 0
() No es probable | 1

::New Page:: ¿Es probable o no?

La carta era escrita por el chico.
() Es probable | 1
() No es probable | 0

La escalera rompió las ramas.
() Es probable | 1
() No es probable | 0

El robot destruyó las naves.
() Es probable | 1
() No es probable | 0

Los aviones derribaron el platillo.
() Es probable | 1
() No es probable | 0

Los helicópteros transportaron el camión.
() Es probable | 1
() No es probable | 0

El huevo destruyó la piedra.
() Es probable | 0
() No es probable | 1

El teléfono rompió la almohada.
() Es probable | 0
() No es probable | 1

El espantapájaros caminó por el maizal.
() Es probable | 0
() No es probable | 1

Los lápices abollaron el submarino.
() Es probable | 0
() No es probable | 1

La miel era creada por las mariposas.
() Es probable | 0
() No es probable | 1

Appendix G Sentences and Drawings in Picture Matching Task - PMT

Practice items

1. Esta es la silla. This is the chair.
2. Este es el libro. This is the book.
3. Esta es la mujer. This is the woman.
4. Este es el niño. This is the kid.

Sentences – Relative Clauses

Token Set 1

NP1 The Truck V to tow NP2 the cars
Token Set 1 a. La camioneta que remolcó los coches.
Token Set 1 b. La camioneta que los coches remolcaron.
Token Set 1 c. La camioneta que los coches remolcó.
Token Set 1 d. La camioneta que remolcaron los coches.

Token Set 2

NP1 The submarine V to sink NP2 the boats
Token Set 2 a. El submarino que hundió los barcos.
Token Set 2 b. El submarino que los barcos hundieron.
Token Set 2 c. El submarino que los barcos hundió.
Token Set 2 d. El submarino que hundieron los barcos.

Token Set 3

NP1 The house V to block NP2 the billboards
Token Set 3 a. La casa que tapó los letreros.
Token Set 3 b. La casa que los letreros taparon.
Token Set 3 c. La casa que los letreros tapó.
Token Set 3 d. La casa que taparon los letreros.

Token Set 4

NP1 The palm tree V to knock down NP2 the light posts
Token Set 4 a. La palma que tumbó los postes.
Token Set 4 b. La palma que los postes tumbaron.
Token Set 4 c. La palma que los postes tumbó.
Token Set 4 d. La palma que tumbaron los postes.

Token Set 5

NP1 The book V to cover NP2 the magazines
Token Set 5a. Este es el libro que cubrió las revistas.
Token Set 5b. Este es el libro que las revistas cubrieron.
Token Set 5c. Este es el libro que las revistas cubrió.
Token Set 5d. Este es el libro que cubrieron las revistas.

Token Set 6

NP1 The gate	**V to dent**	**NP2 the cars**
Token Set 6 a. El portón que abolló los coches.		
Token Set 6 b. El portón que los coches abollaron		
Token Set 6 c. El portón que los coches abolló.		
Token Set 6 d. El portón que abollaron los coches.		

Token Set 7

NP1 The piano	**V to smash**	**NP2 the sofas**
Token Set 7a. El piano que aplastó los sofás.		
Token Set 7b. El piano que los sofás aplastaron.		
Token Set 7c. El piano que los sofás aplastó.		
Token Set 7d. El piano que aplastaron los sofás.		

Token Set 8

NP1 The door	**V to break**	**NP2 the motorcycles**
Token Set 8a. La puerta que quebró las motocicletas.		
Token Set 8b. La puerta que las motocicletas quebraron.		
Token Set 8c. La puerta que las motocicletas quebró.		
Token Set 8d. La puerta que quebraron las motocicletas.		

Token Set 9

NP1 The raft **V to carry** **NP2 the logs**
Token Set 9a. Esta es la balsa que llevó los troncos.
Token Set 9b. Esta es la balsa que los troncos llevaron.
Token Set 9c. Esta es la balsa que los troncos llevó.
Token Set 9d. Esta es la balsa que llevaron los troncos.

Token Set 10 (Not included)

NP1 The door **V to damage** **NP2 the windows**
Token Set 10a. Esta es la puerta que estropeó las ventanas.
Token Set 10b. Esta es la puerta que las ventanas estropearon.
Token Set 10c. Esta es la puerta que las ventanas estropeó.
Token Set 10d. Esta es la puerta que estropearon las ventanas.

Token Set 11

NP1 The trains **V to crash into** **NP2 the cars**
Token Set 11a. Este es el tren que chocó los coches.
Token Set 11b. Este es el tren que los coches chocaron.
Token Set 11c. Este es el tren que los coches chocó.
Token Set 11d. Este es el tren que chocaron los coches.

Token Set 12

NP1 The flying saucer V to destroy NP2 the airplanes
Token Set 12a. Este es el platillo que destruyó los aviones.
Token Set 12b. Este es el platillo que los aviones destruyeron.
Token Set 12c. Este es el platillo que los aviones destruyó.
Token Set 12d. Este es el platillo que destruyeron los aviones.

Token Set 13

NP1 The kart V to drag NP2 the kites
Token Set 13a. Este es el carro que arrastró los papalotes.
Token Set 13b. Este es el carro que los papalotes arrastraron.
Token Set 13c. Este es el carro que los papalotes arrastró.
Token Set 13d. Este es el carro que arrastraron los papalotes.

Token Set 14

NP1 The truck V to transport NP2 the helicopters
Token Set 14a. Este es el camión que transportó los helicópteros.
Token Set 14b. Este es el camión que los helicópteros transportaron.
Token Set 14c. Este es el camión que los helicópteros transportó.
Token Set 14d. Este es el camión que transportaron los helicópteros.

Token Set 15

NP1 The roller **V to stain** **NP2 the brushes**
Token Set 15a. Este es el rodillo que manchó las brochas.
Token Set 15b. Este es el rodillo que las brochas mancharon.
Token Set 15c. Este es el rodillo que las brochas manchó.
Token Set 15d. Este es el rodillo que mancharon las brochas.

Token Set 16 (Not included)

NP1 The box **V to hold** **NP2 the bats**
Token Set 16a. Esta es la caja que sostiene los bates.
Token Set 16b. Esta es la caja que los bates sostienen.
Token Set 16c. Esta es la caja que los bates sostiene.
Token Set 16d. Esta es la caja que sostienen los bates.

Token Set 17

NP1 The plane **V to destroy** **NP2 the missiles**
Token Set 17a. Este es el avión que destruyó los misiles.
Token Set 17b. Este es el avión los misiles destruyeron.
Token Set 17c. Este es el avión que los misiles destruyó.
Token Set 17d. Este es el avión que destruyeron los misiles.

Token Set 18

NP1 The bed V to hide NP2 the shelves
Token Set 18a. Esta es la cama que ocultó los estantes.
Token Set 18b. Esta es la cama que los estantes ocultaron.
Token Set 18c. Esta es la cama que los estantes ocultó.
Token Set 18d. Esta es la cama que ocultaron los estantes.

Token Set 19 (Not included)

NP1 The tray V to hold NP2 the glasses
Token Set 19a. Esta es la bandeja que sostiene los vasos.
Token Set 19b. Esta es la bandeja que los vasos sostienen.
Token Set 19c. Esta es la bandeja que los vasos sostiene.
Token Set 19d. Esta es la bandeja que sostienen los vasos.

Token Set 20

NP1 The ladder V to break NP2 the blades
Token Set 20a. Esta es la escalera que rompió las aspas.
Token Set 20b. Esta es la escalera que las aspas rompieron.
Token Set 20c. Esta es la escalera que las aspas rompió.
Token Set 20d. Esta es la escalera que rompieron las aspas.

Token Set 21

NP1 The helicopter V to lift NP2 the cranes
Token Set 21a. Este es el helicóptero que alzó las grúas.
Token Set 21b. Este es el helicóptero que las grúas alzaron.
Token Set 21c. Este es el helicóptero que las grúas alzó .
Token Set 21d. Este es el helicóptero que alzaron las grúas .

Token Set 22 (Not included)

NP1 The lightpole V to brake NP2 the coconuts
Token Set 22a. Este es el poste que rompió los cocos.
Token Set 22b. Este es el poste que los cocos rompieron.
Token Set 22c. Este es el poste que los cocos rompió.
Token Set 22d. Este es el poste que rompieron los cocos.

Token Set 23

NP1 The motorcycle V to overtake NP2 the cars
Token Set 23a. Esta es la motocicleta que rebasó los carros.
Token Set 23b. Esta es la motocicleta que los carros rebasaron
Token Set 23c. Esta es la motocicleta que los carros rebasó.
Token Set 23d. Esta es la motocicleta que rebasaron los carros.

Token Set 24

NP1 The hose V to get wet NP2 the sprinklers
Token Set 24a. Esta es la manguera que mojó los aspersores.
Token Set 24b. Esta es la manguera que los aspersores mojaron.
Token Set 24c. Esta es la manguera que los aspersores mojó.
Token Set 24d. Esta es la manguera que mojaron los aspersores

Token Set 25

NP1 The spaceship V to destroy NP2 the robots
Token Set 25a. Esta es la nave que destruyó los robots.
Token Set 25b. Esta es la nave que los robots destruyeron.
Token Set 25c. Esta es la nave que los robots destruyó .
Token Set 25d. Esta es la nave que destruyeron los robots.

Token Set 26

NP1 The canoe V to tip over NP2 the rafts
Token Set 26a. Esta es la canoa que volcó las balsas.
Token Set 26b. Esta es la canoa que las balsas volcaron.
Token Set 26c. Esta es la canoa que las balsas volcó.
Token Set 26d. Esta es la canoa que volcaron las balsas.

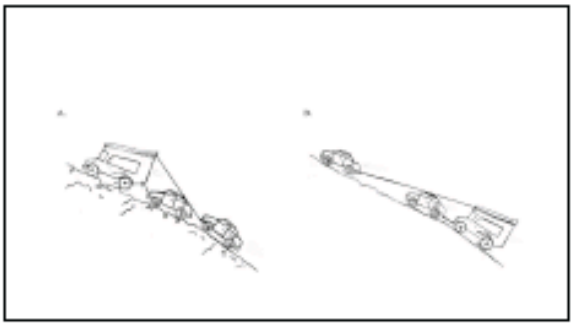
Token Set 27

NP1 The boat V to brake NP2 the rocks
Token Set 27a. Esta es la lancha que rompió las rocas.
Token Set 27b. Esta es la lancha que las rocas rompieron.
Token Set 27c. Esta es la lancha que las rocas rompió.
Token Set 27d. Esta es la lancha que rompieron las rocas.

Token Set 28

NP1 The ladder V to brake NP2 the branches
Token Set 28a. Esta es la escalera que rompió las ramas.
Token Set 28b. Esta es la escalera que las ramas rompieron.
Token Set 28c. Esta es la escalera que las ramas rompió.
Token Set 28d. Esta es la escalera que rompieron las ramas.

Drawings – Relative Clauses



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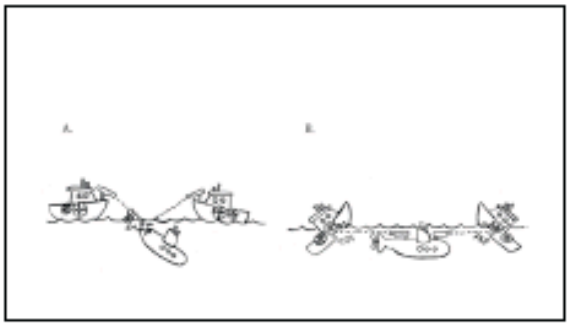

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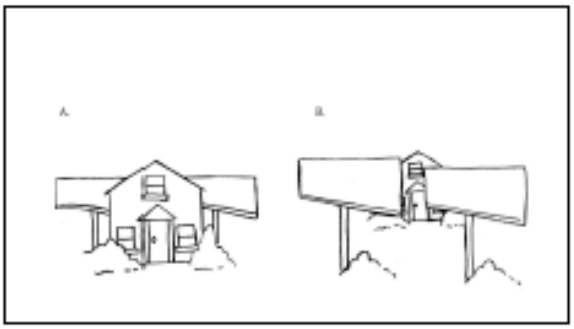

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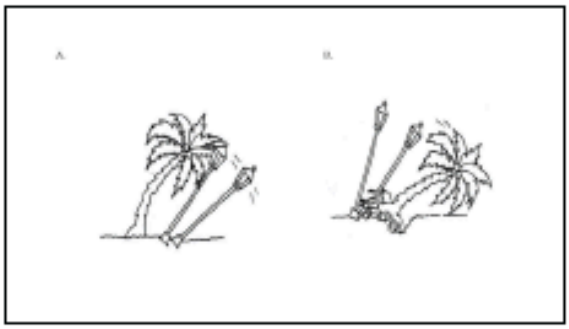

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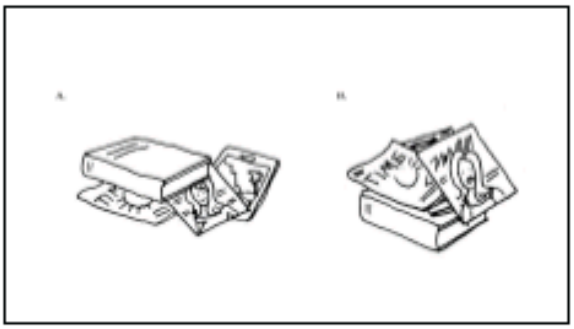

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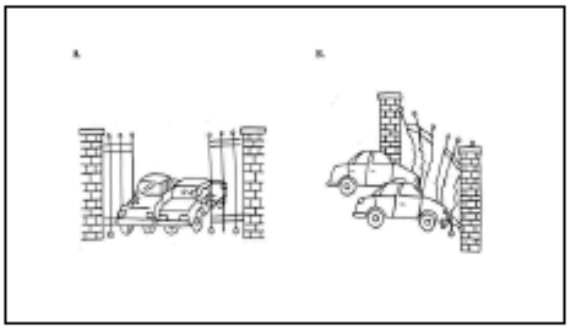

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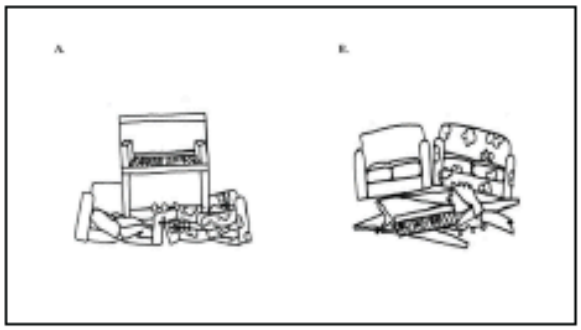

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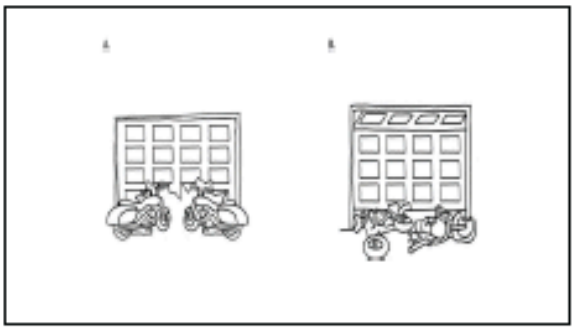

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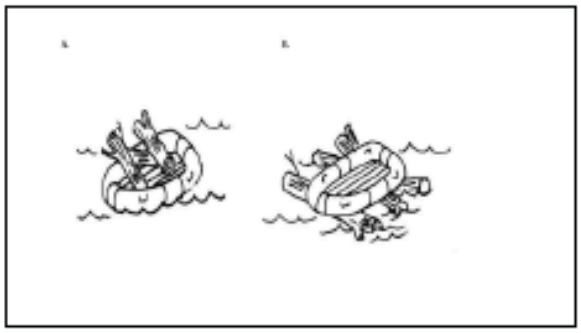

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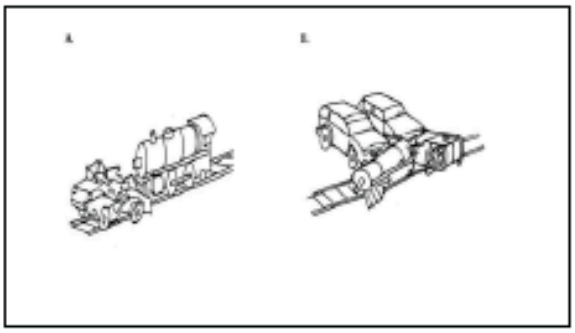

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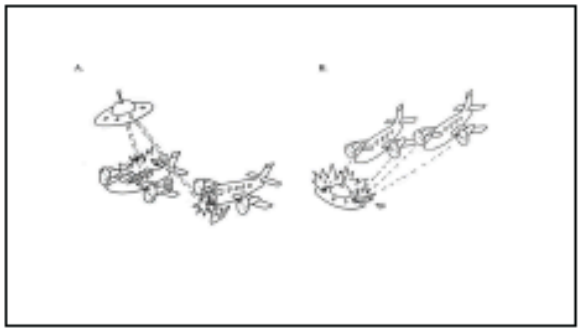

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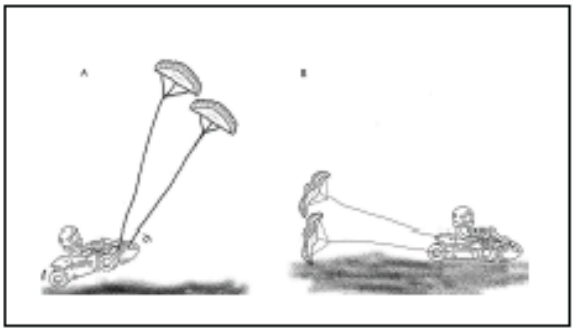

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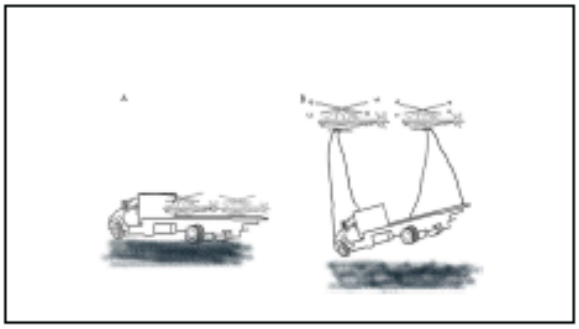

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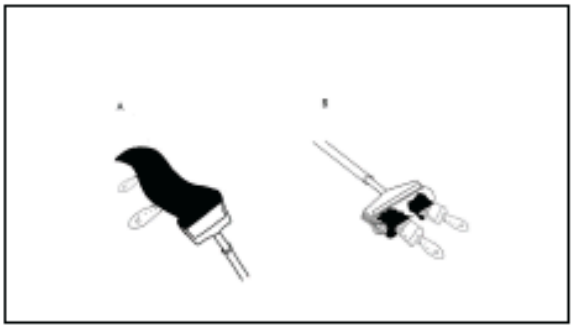

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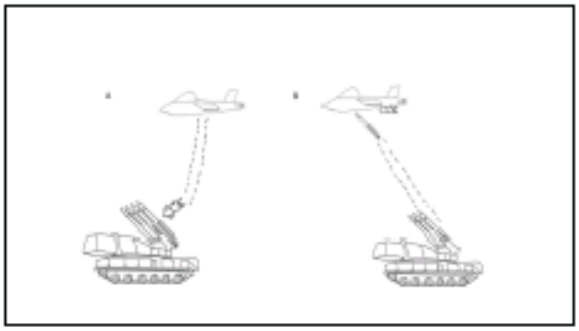

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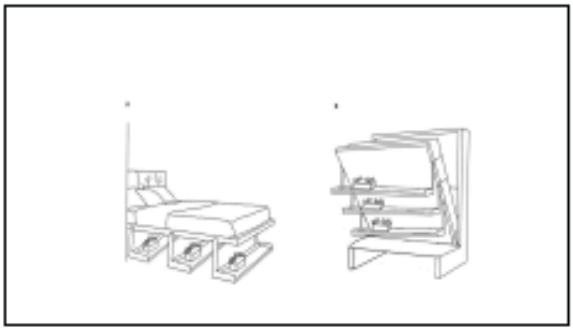

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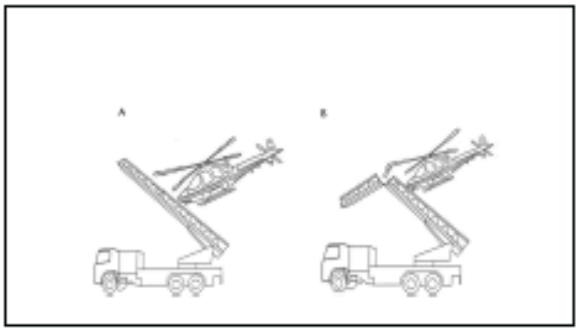

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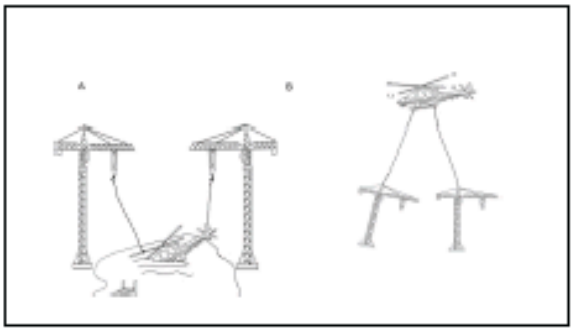

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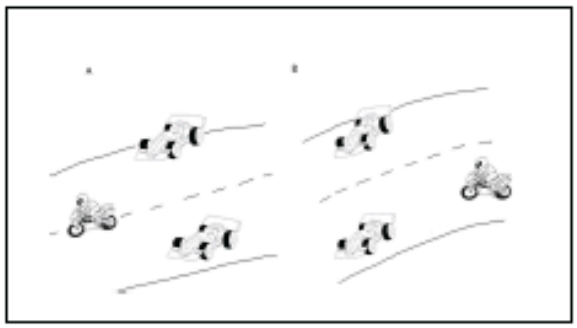

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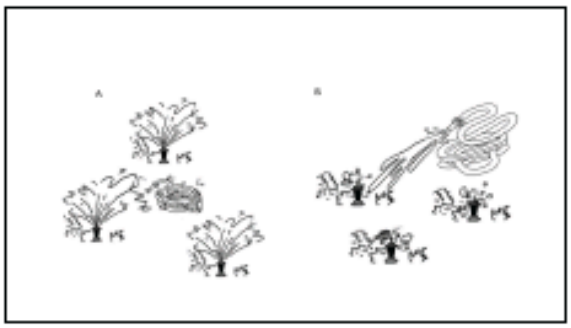

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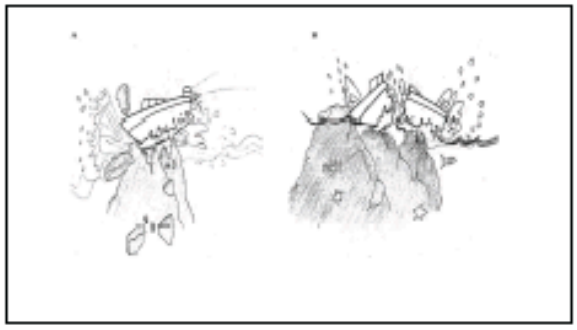

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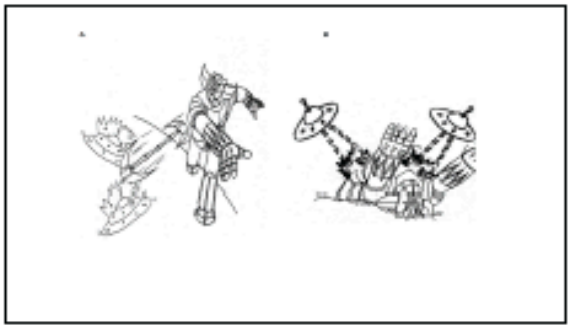

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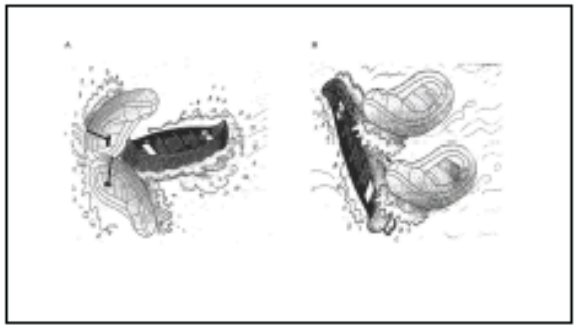

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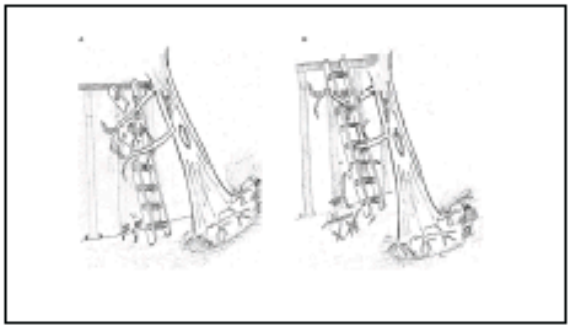


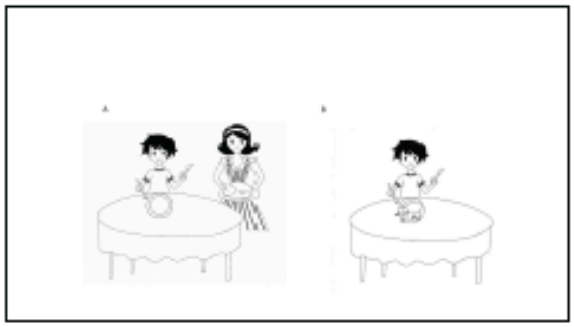
24

Sentences – Passive Clauses

1. La cena era servida.	Dinner was being served.
2. La cena estaba servida.	Dinner was served.
3. El paciente era medicado.	The patient was being medicated.
4. El paciente estaba medicado.	The patient was medicated.
5. La cortina era colgada.	The curtain was being hung.
6. La cortina estaba colgada.	The curtain was hung.
7. El carro era vandalizado.	The car was being vandalized.
8. El carro estaba vandalizado.	The car was vandalized.
9. La ropa era lavada.	The clothes were being washed.
10. La ropa estaba lavada.	The clothes were washed.
11. La chica era peinada.	The woman was being coiffed.
12. La chica estaba peinada.	The woman was coiffed.
13. El submarino era hundido.	The submarine was being sunk.
14. El submarino estaba hundido.	The submarine was sunk.
15. El platillo era destruido.	The flying saucer was being destroyed.
16. El platillo estaba destruido.	The flying saucer was destroyed.
17. El coche era abollado.	The car was being dented.
18. El coche estaba abollado.	The car was dented.
19. La caja era acomodada.	The box was being placed.
20. La caja estaba acomodada.	The box was placed.
21. La bicicleta era arreglada.	The bicycle was being fixed.
22. La bicicleta estaba arreglada.	The bicycle was fixed.
23. La puerta era cerrada.	The door was being closed.
24. La puerta estaba cerrada.	The door was closed.
25. El castillo era construido.	The castle was being built.
26. El castillo estaba construido.	The castle was built.
27. El árbol era adornado.	The tree was being decorated.
28. El árbol estaba adornado.	The tree was decorated.
29. La manzana era picada.	The apple was being sliced.
30. La manzana estaba picada.	The apple was sliced.
31. El hombre era maquillado.	The man was being made up.
32. El hombre estaba maquillado.	The man was wearing makeup.
33. El cuchillo era amolado.	The knife was being sharpened.
34. El cuchillo estaba amolado.	The knife was sharpened.
35. La antena era fijada.	The antenna was being affixed.
36. La antena estaba fijada.	The antenna was affixed.
37. El café era colado.	The coffee was being strained.
38. El café estaba colado.	The coffee was strained.
39. La carta era escrita.	The letter was being written.
40. La carta estaba escrita.	The letter was written.
41. La solicitud era rellenada.	The application was being filled out.
42. La solicitud estaba rellenada.	The application was filled out.
43. El barro era moldeado.	The clay was being shaped.
44. El barro estaba moldeado.	The clay was shaped.
45. La cenicienta era transformada.	Cinderella was being transformed.

46. La cenicienta estaba transformada. Cinderella was transformed.
47. La computadora era ensamblada. The computer was being assembled.
48. La computadora estaba ensamblada. The computer was being assembled.

Drawings – Passive Clauses



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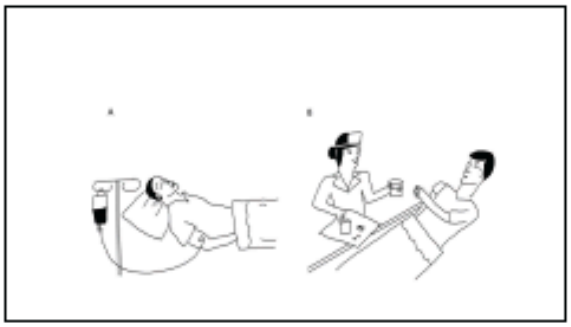

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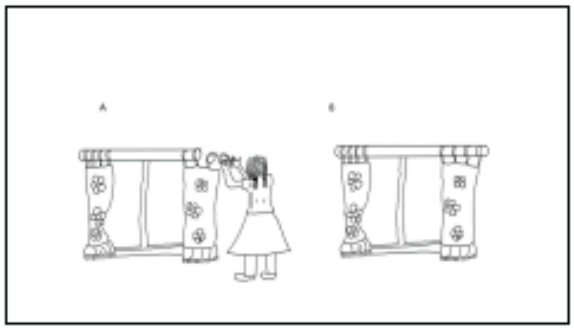

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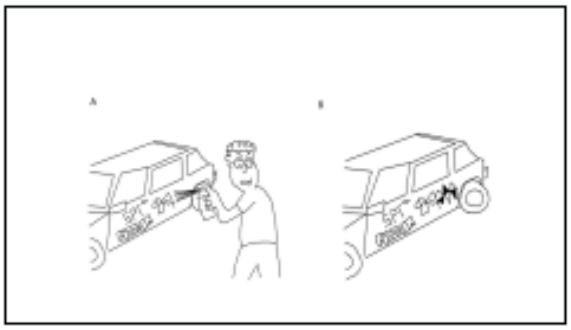

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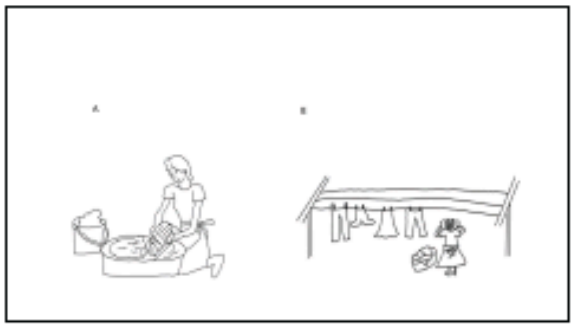

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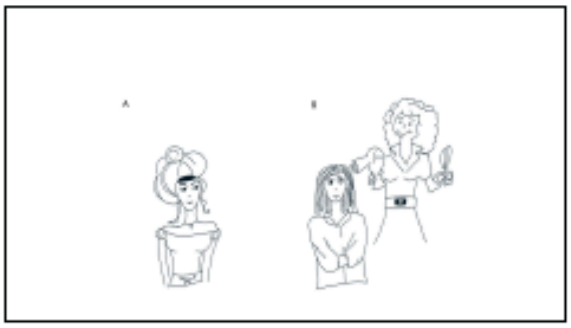

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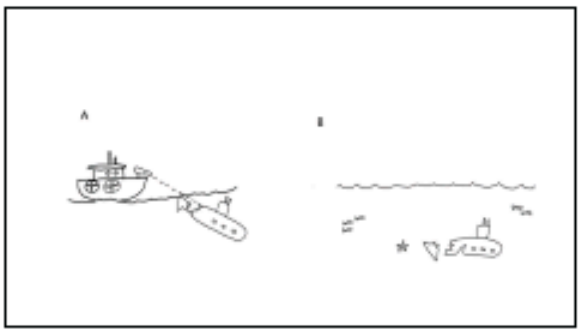

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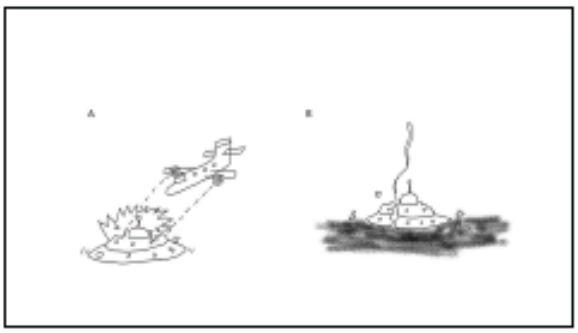

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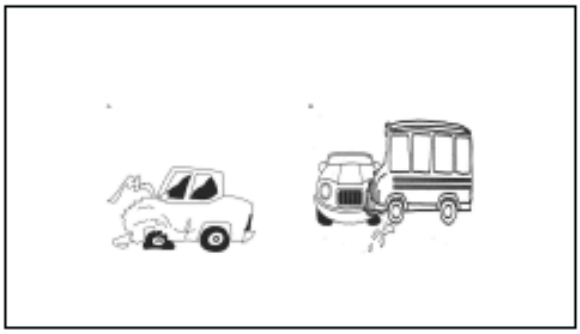

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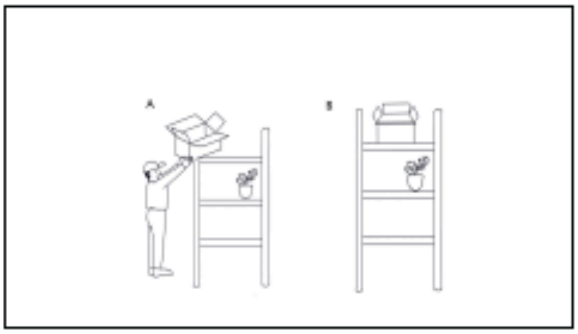

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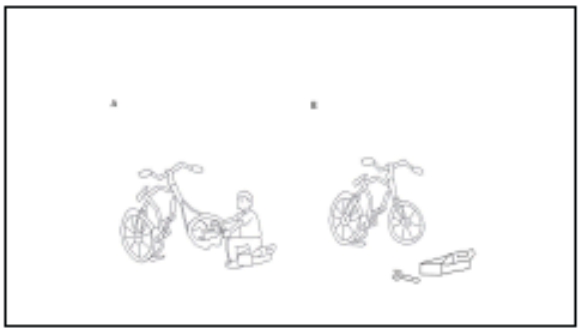

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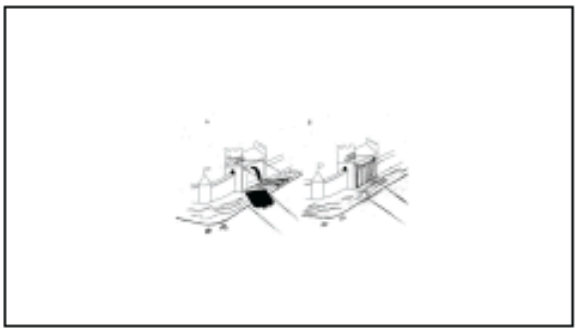

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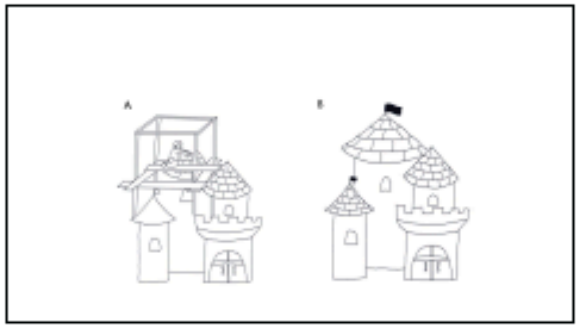

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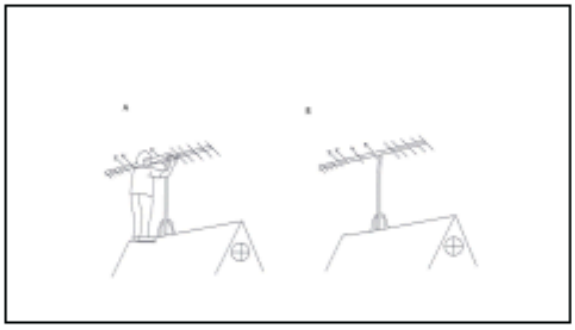

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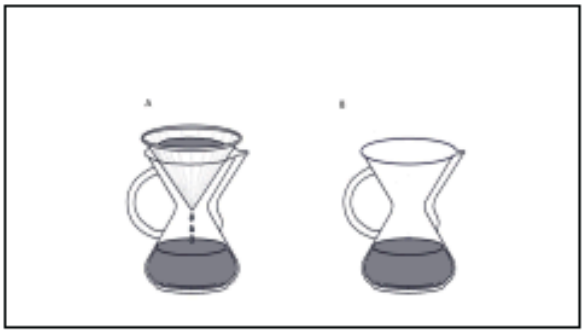

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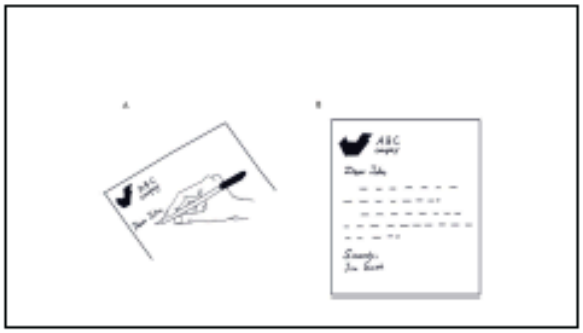

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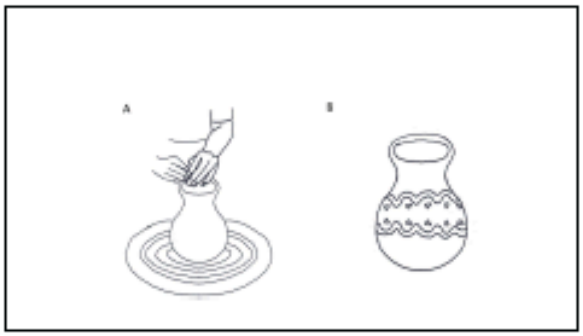

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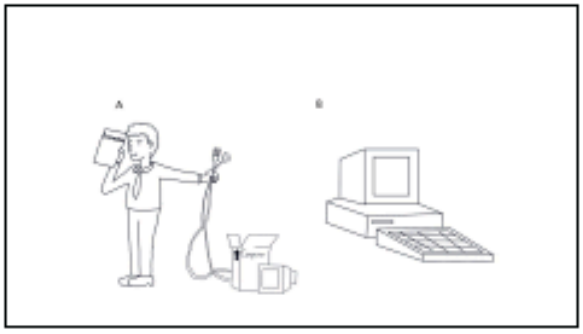

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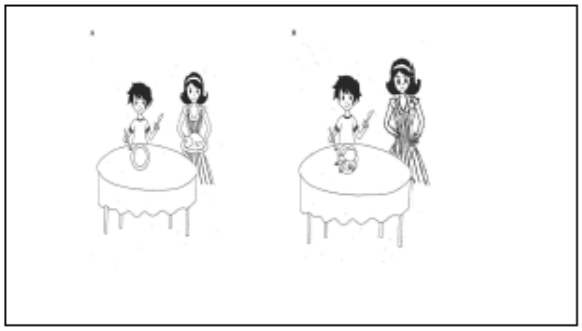
Sentences in active voice – with verb in the imperfect tense

1. La madre servía la cena. The mother served dinner.
2. La enfermera medicaba al paciente. The nurse medicated the patient.
3. La chica colgaba la cortina. The woman hung the curtain.
4. El chico vandalizaba el carro. The guy vandalized the car.
5. La mujer lavaba la ropa. The woman washed the clothes.
6. La peluquera peinaba a la chica. The beautician coiffed the woman.
7. El bote hundía el submarino. The boat sank the submarine.
8. El avión destruía al platillo. The airplane destroyed the flying saucer.
9. El autobús abollaba al coche. The bus dented the car.
10. El hombre acomodaba la caja. The man placed the box.
11. El chico arreglaba la bicicleta. The guy fixed the bicycle.
12. El chico cerraba la puerta. The guy closed the door.
13. El hombre construía el castillo. The man built the castle.
14. El hombre picaba la manzana. The man sliced the apple.
15. Los niños adornaban el árbol. The children decorated the tree.
16. La mujer maquillaba al hombre. The woman made up the guy.
17. El hombre amolaba el cuchillo. The man sharpened the knife.
18. El hombre fijaba la antena. The man attached the antenna.
19. El hombre colaba café. The man strained coffee.
20. La mujer escribía la carta. The woman wrote the letter.
21. El chico rellenaba la solicitud. The guy filled out the application.
22. La mujer moldeaba el barro. The woman shaped the clay.
23. El hada madrina transformaba a la cenicienta. The fairy godmother transformed Cinderella.
24. El chico ensamblaba la computadora. The guy assembled the computer.

Drawings for sentences in active voice – with verb in the imperfect tense



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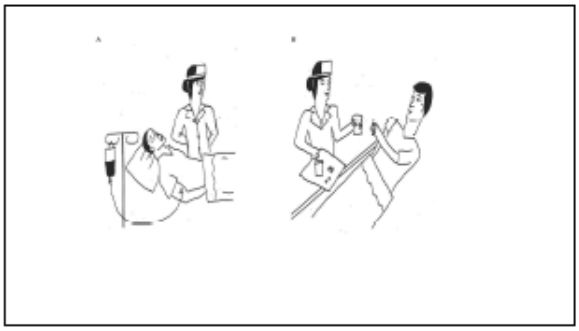

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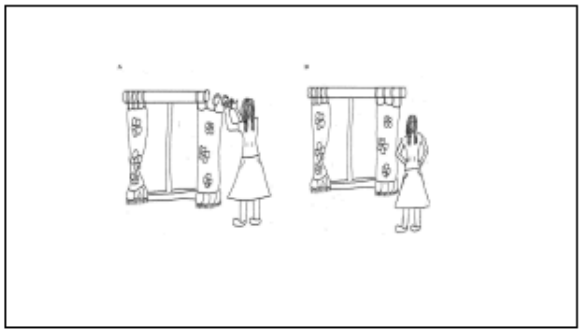

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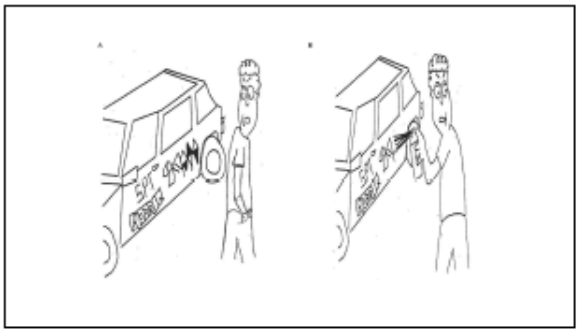

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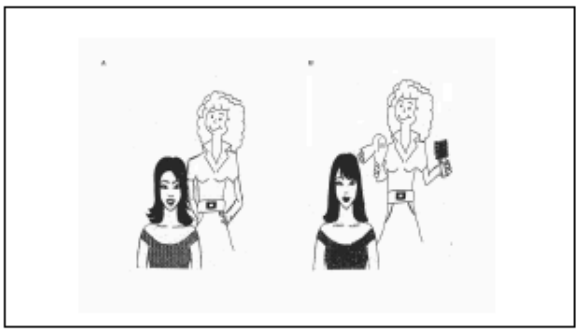

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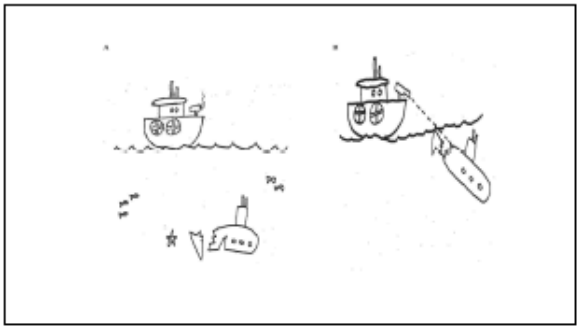

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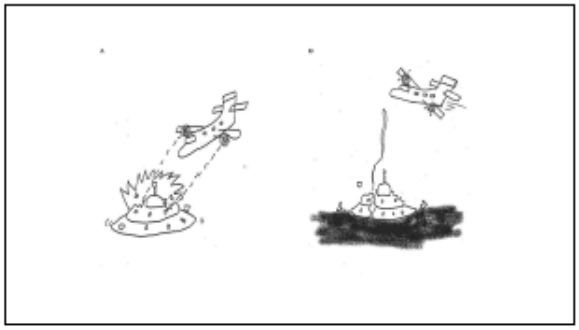

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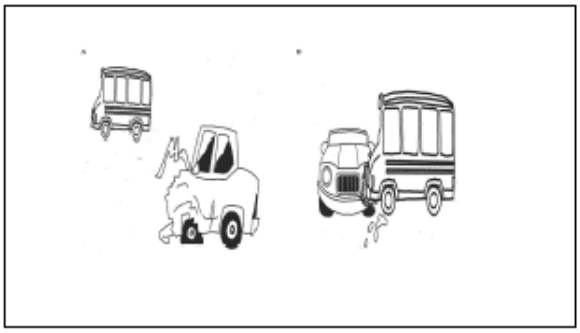

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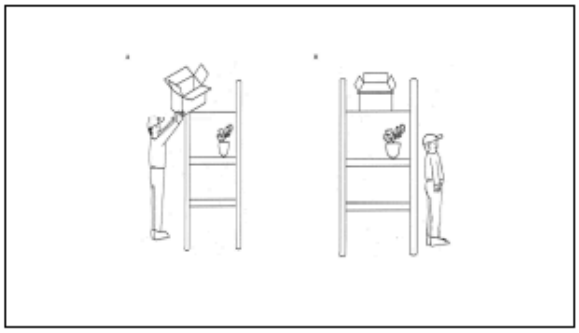

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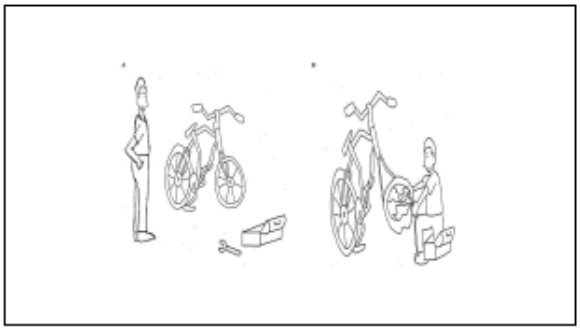

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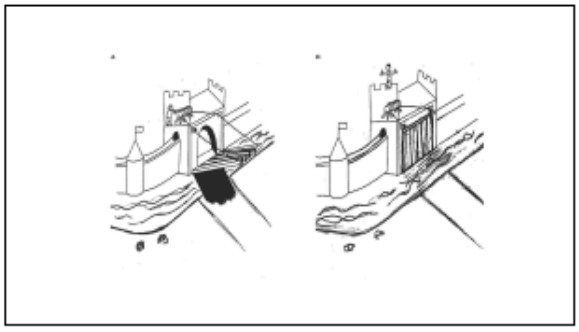

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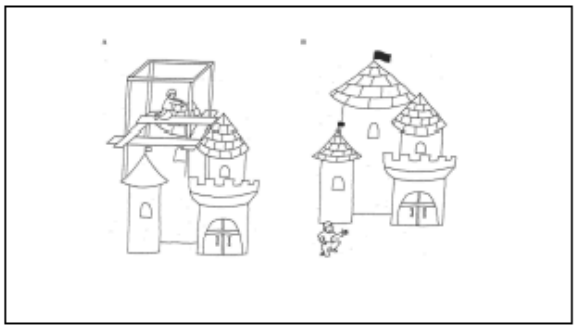

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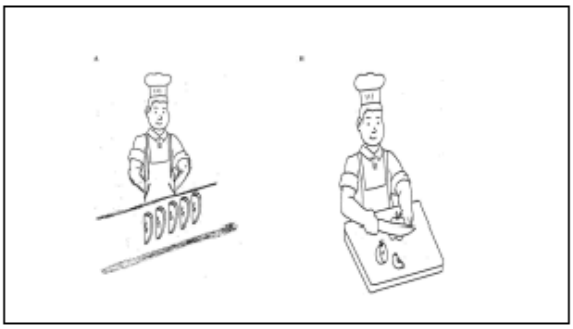

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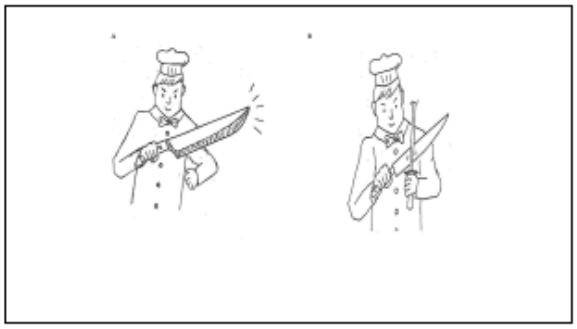

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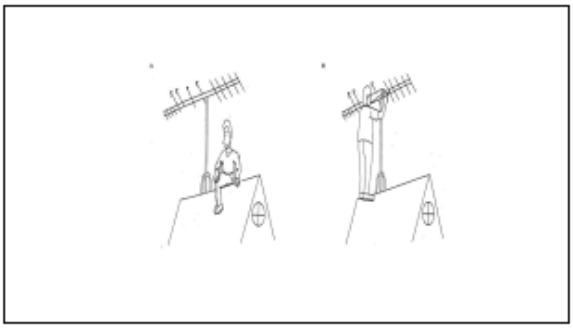

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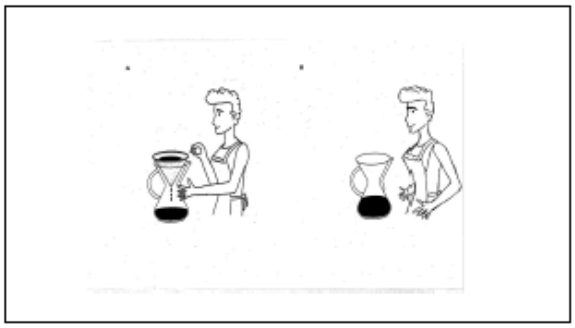

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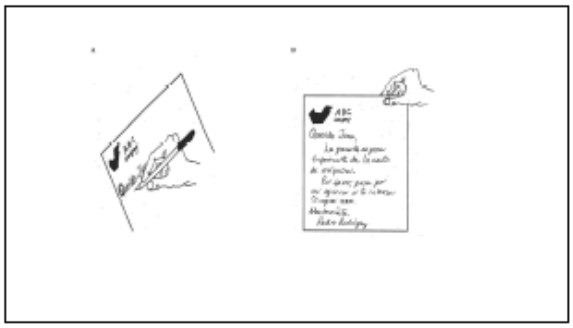

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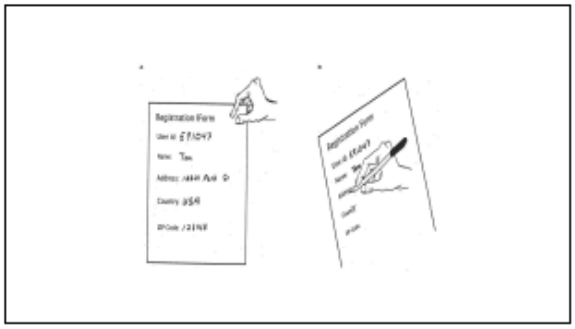

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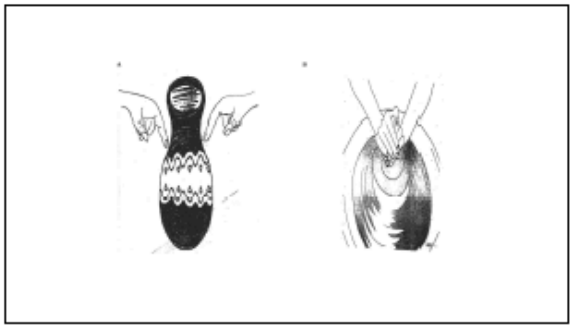

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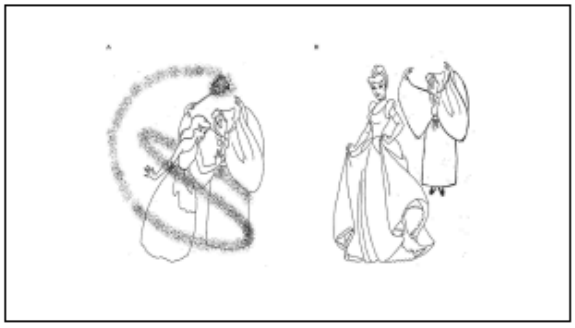

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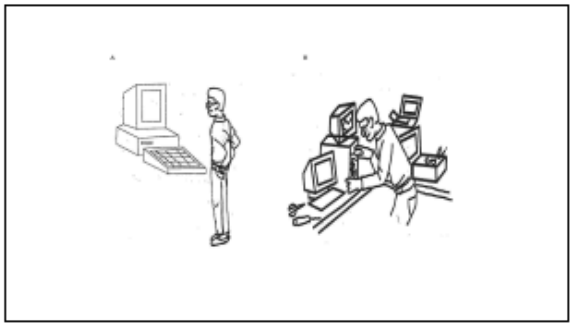

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Filler Items – Picture Matching Task

Filler Set 1-A

1. El volcán que quemó el dragón.	This is the volcano that burned the dragon.
2. El faro que alumbró el barco.	This is the lighthouse that illuminated the boat.
3. El tractor que aplastó el camión.	This is the tractor that smashed the truck.
4. El coche que chocó la bicicleta.	This is the car that crashed into the bicycle.
5. El arrecife que el barco dañó.	This is the coral reef that damaged the boat
6. La carreta que el coche llevaba.	This is the wagon that towed the car.
7. El perro que el amo bañó.	This is the dog that the owner bathed.
8. El machete que el coco partió.	This is the machete that cut open a coconut.

Fillers set 1-B

1. El dragón que quemó el volcán.	This is the dragon that burned the volcano.
2. El barco que alumbró el faro.	This is the boat that illuminated the lighthouse.
3. El camión que aplastó el tractor.	This is the truck that smashed the tractor.
4. La bicicleta que chocó el coche.	This is the bicycle that crashed into the car.
5. El barco que el arrecife dañó.	This is the boat that damaged the coral reef.
6. El coche que la carreta llevaba.	This is the car that towed the wagon.
7. El amo que el perro bañó.	This is the owner that the dog bathed.
8. El coco que el machete partió.	This is the coconut that cut open the machete.

Fillers with *estar*

1. El camión estaba encima del tractor.	The truck was on top of the tractor.
2. El faro estaba en la costa.	The light house was on the shore.
3. El gato estaba en el sofá.	The cat was on the sofa.
4. El chico estaba arreglando la silla.	The guy was fixing the chair.
5. El libro estaba en el mostrador.	The book was on the counter.
6. El chico estaba en el cine.	The guy was in the movie theater.
7. Los chicos estaban arreglando la silla.	The guys were fixing the chair.
8. Los libros estaban en el mostrador.	The books were on the counter.
9. Los chicos estaban en el cine.	The guys were in the movie theater.
10. Los camiones estaban encima del tractor.	The trucks were on top of the tractor.
11. Los faros estaban en la costa.	The lighthouses were on the shore.
12. Los gatos estaban en el sofá.	The cats were on the sofa.

Fillers with *ser*

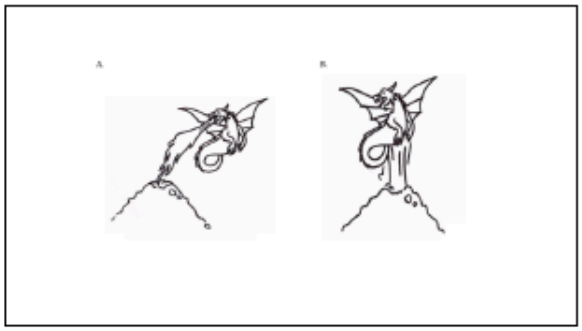
1. Eran varios chicos.	There were several guys.
2. Eran varios libros.	There were several books.
3. Eran tres diseñadores.	There were three designers.
4. Eran tres gatos.	There were three cats.
5. Eran dos perros.	There were two dogs.
6. Eran dos camiones.	There were two trucks.
7. Era un gato.	There was one cat.
8. Era un perro.	There was one dog.

9. Era un camión. There was one truck.
10. Era un chico. There was one guy.
11. Era un libro. There was one book.
12. Era una diseñadora. There was one designer.

Verbal passive clauses with *fue*

1. El dragón fue quemado por el volcán. The dragon was burned by the volcano.
2. El platillo fue destruido por los aviones. The flying saucer was destroyed by the airplanes.
3. El portón fue abollado por los carros. The gate was dented by the cars.
4. La motocicleta fue rebasada por los carros. The motorcycle was overtaken by the cars.
5. La camioneta fue remolcada por los carros. The truck was towed by the cars.
6. La mujer fue asesinada por el criminal. The woman was murdered by the criminal.
7. La paciente fue examinada por el médico. The patient was examined by the doctor.
8. La mujer fue secuestrada por el criminal. The woman was kidnapped by the criminal.
9. La niña fue castigada por la mamá. The girl was punished by the mother.
10. El barco fue alumbrado por el faro. The boat was lighted up by the lighthouse.
11. El robot fue destruido por las naves. The robot was destroyed by the planes.
12. El helicóptero fue levantado por las grúas. The helicopter was lifted up by the cranes.

Drawings for Filler Items – Picture Matching Task



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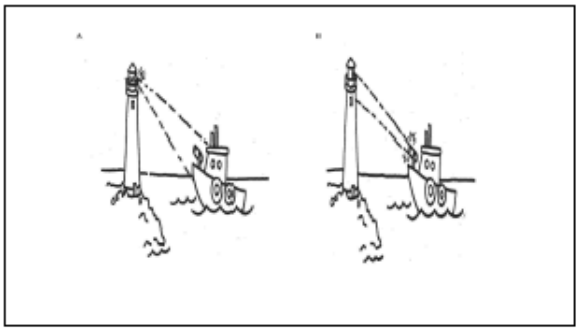

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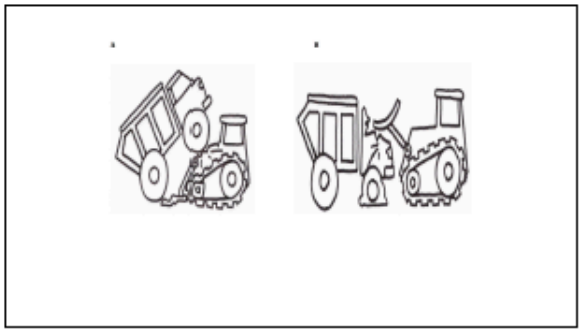

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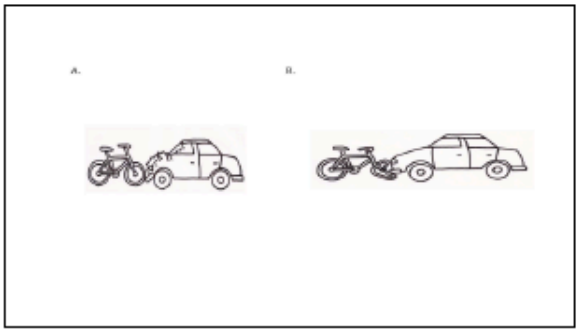

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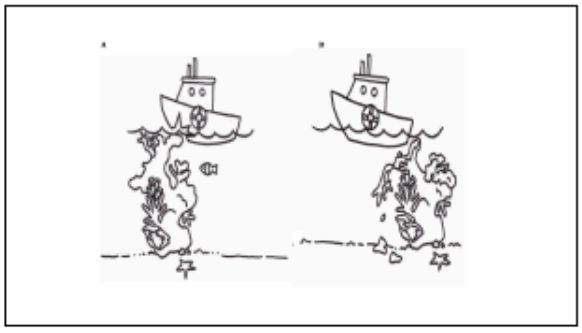

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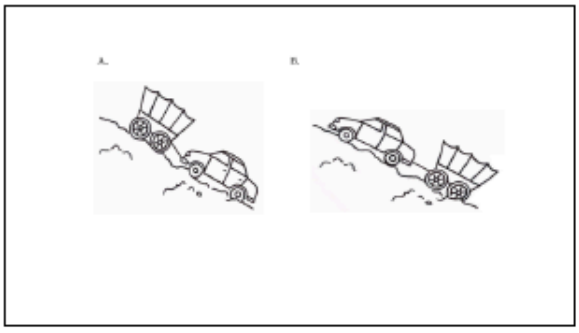

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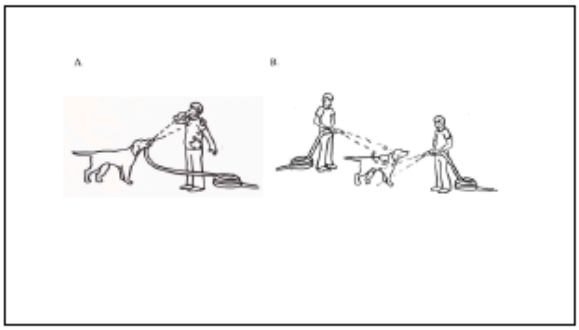

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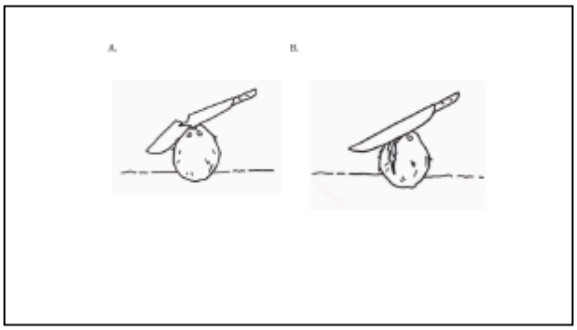

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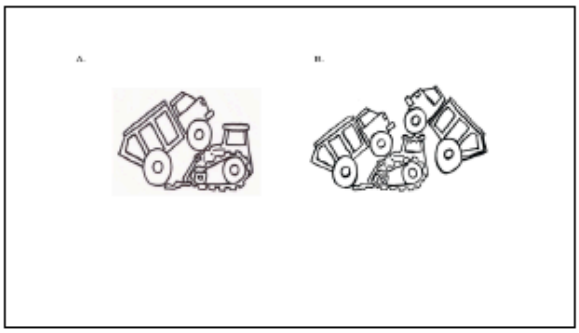

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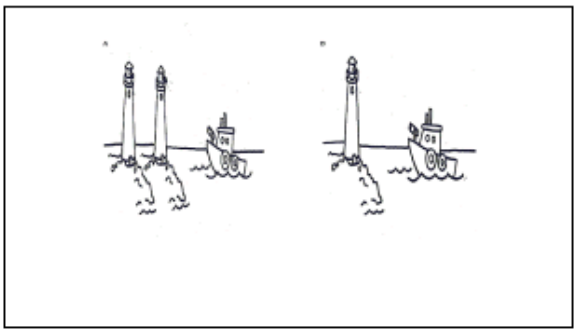

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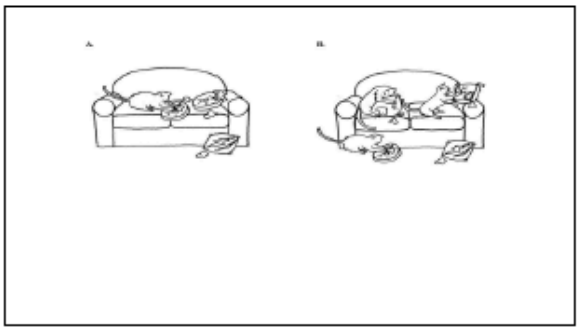

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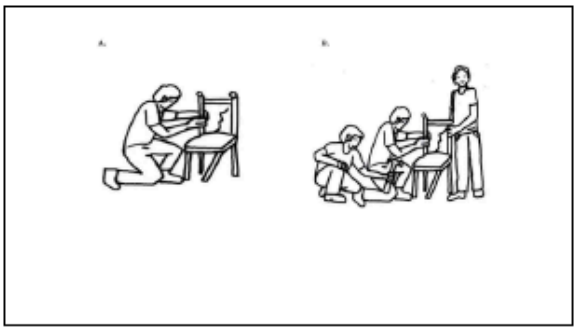

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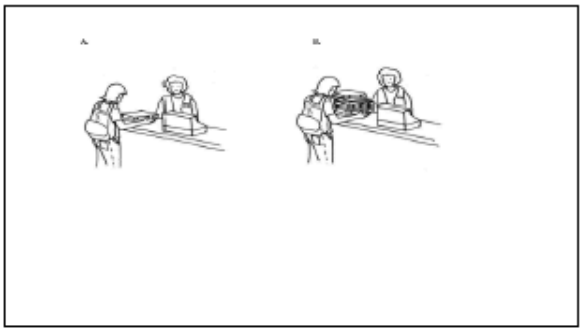

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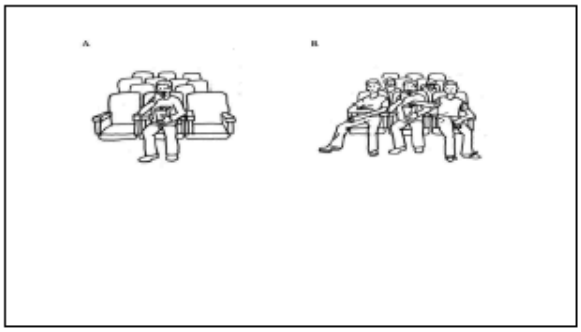

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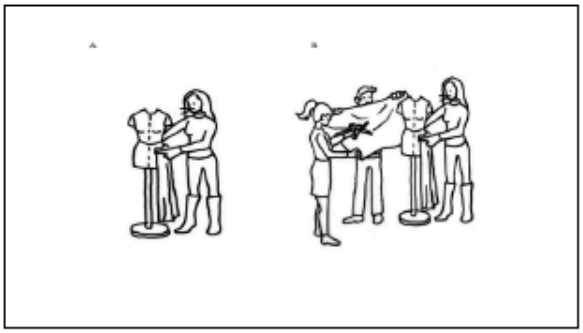

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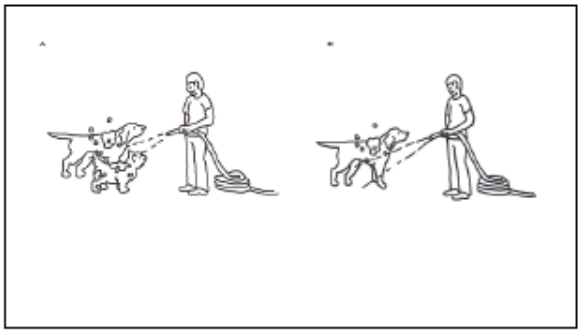

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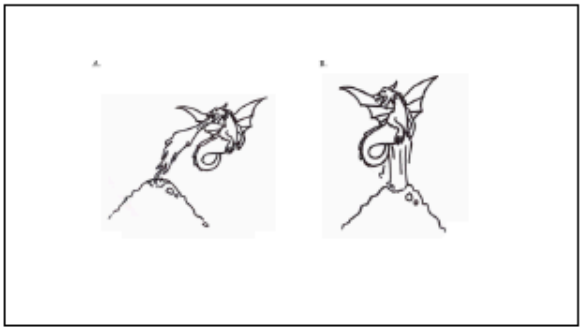

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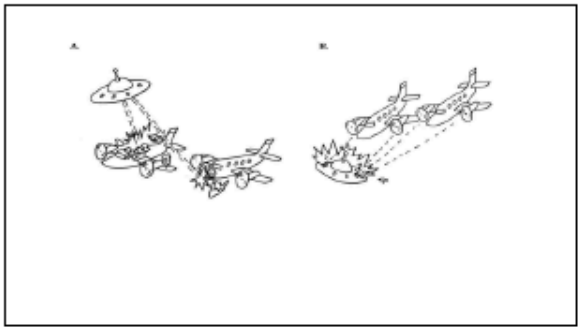

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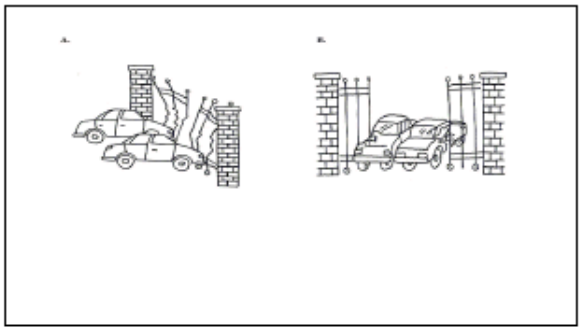

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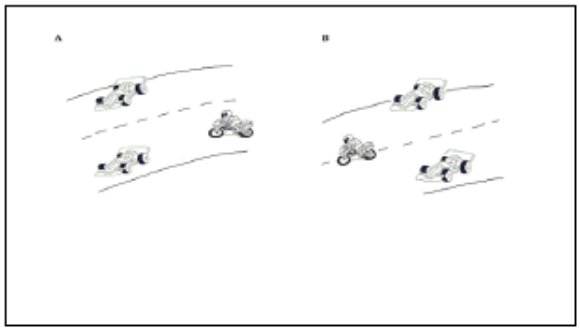

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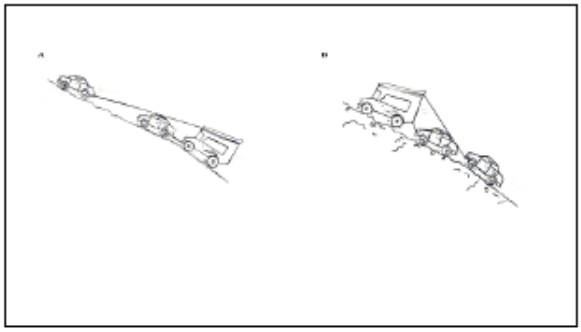

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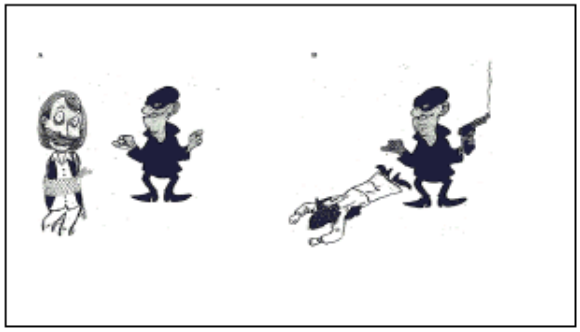

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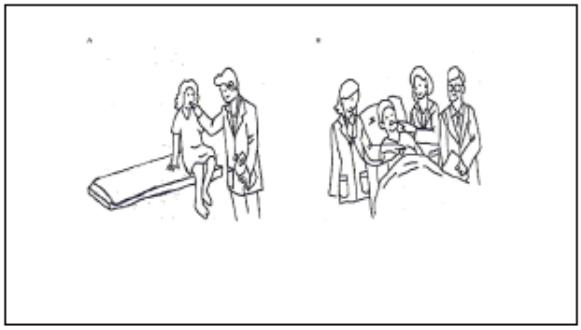

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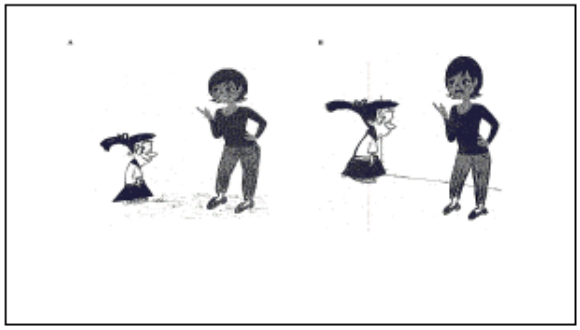

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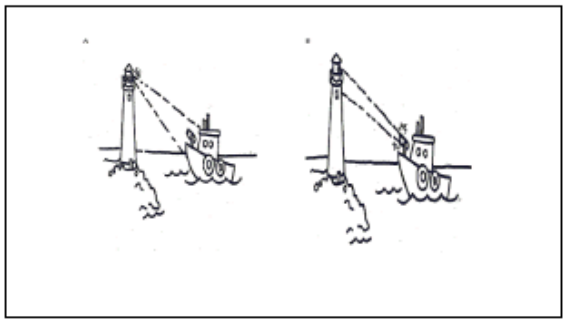

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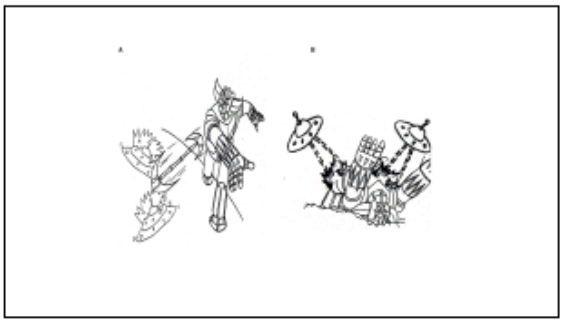

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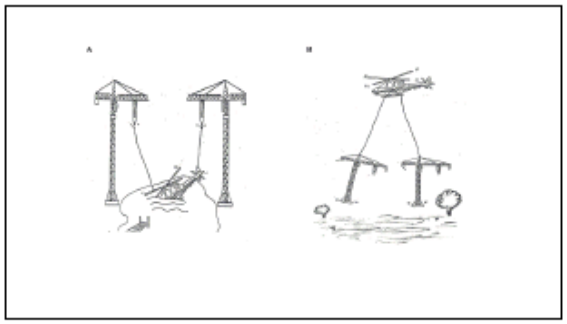

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