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Abstract

We assessed the roles of first language (L1) and second language (L2) proficiency in the processing of preverbal clitics in L2 Spanish by considering the predictions of four processing theories - Input Processing Theory (VanPatten, 1996, 2004), the Unified Competition Model (MacWhinney, 2005, 2012), the Amalgamation Model (Hernández, Bates, & Avila, 1994), and the Associative-Cognitive CREED (Ellis, 2006a, 2006b). We compared the performance of L1 English (typologically different from Spanish) to L1 Romanian (typologically similar to Spanish) speakers from various L2 Spanish proficiency levels on an auditory sentence processing task. We found main effects of proficiency, condition, and L1, and an interaction between proficiency and condition. Although we did not find an interaction between L1 and condition, the L1 Romanians showed an overall advantage that may be attributable to structure-specific experience in the L1, raising new questions about how crosslinguistic differences influence the processing strategies learners apply to their L2.

Keywords: L2 processing, Spanish, clitics, L1 transfer

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Introduction

Second language (L2) learners have been shown to have difficulty with processing preverbal pronominal clitic structures in Spanish (e.g., Liceras, 1985; LoCoco, 1987; VanPatten, 1984) such as in (1a), which are ungrammatical in English, as shown in (1b):

(1a) ***Lo*** *besa* *la niña*.
[Him-3RDSINGMASCACC kiss-3RDSINGPRE the girl]
The girl kisses him.

(1b) ***Him** kisses the girl.
The girl kisses him.

Processing these basic structures properly is part of becoming proficient in the language. In the present work, we directly examine whether speakers of a typologically similar first language (L1) with regard to pronominal clitics, Romanian, are at an advantage as compared to speakers of a typologically different language (here, English), and we examine the trajectory of learning across a range of proficiency levels for various clitic structures.

Thus far, researchers have only considered the acquisition of L2 Spanish clitics by L1 English speakers (e.g., Lee & Malovrh, 2009; Liceras, 1985; LoCoco, 1987; Malovrh, 2006; Tight, 2012; VanPatten, 1984), or for speakers of an L1 that differs significantly from Spanish in regards to the treatment of pronominal clitics (for French and English, see Duffield & White, 1999; for Italian and English, see Gass, 1989; for Italian and Spanish, see Isabelli, 2008). Romanian, however, has a similar system of pronominal clitics to Spanish, allowing for structures with preverbal clitics and postverbal subjects, as in (2) from Dobrovie-Sorin (1999):

(2) *O* *caută* *băiatul*
[Him-3RDSINGMASCACC kiss-3RDSINGPRE girl-the]
The girl kisses him.

Thus, Romanians have significant experience with processing preverbal clitics. In fact, Babyonyshev and Marin (2006) found that in Romanian, children exhibit acquisition patterns of object clitics that are similar to those of children acquiring Spanish. This commonality suggests that acquiring preverbal clitics in L2 Spanish may be considerably easier for Romanian speakers than for English speakers. Therefore, we compared the processing of L1 English learners of Spanish to L1 Romanian learners of Spanish. In addition, we also compared the processing of pronominal clitics across levels of Spanish L2 proficiency, in order to disentangle the influence of overall proficiency from that of the learners' L1. In the present article, we aimed to examine how these two important factors, L1 and proficiency, affect L2 learners' ability to successfully process clitic argument structure in an L2.

Four main theories offer explanations of the current findings on the learning of clitic structure in an L2: Input Processing Theory (VanPatten, 1996, 2004), the Unified Competition Model, also known as the Unified Model (MacWhinney, 2005, 2012), the

Amalgamation Model (Hernández et al., 1994), and the Associative-Cognitive CREED (Ellis, 2006a, b). Our examination of whether or not a learner's L1 plays a determining role in processing success of preverbal pronominal clitic structures in L2 Spanish, as well as of L2 proficiency, has implications for all of these.

Research on L2 Acquisition of Spanish Clitics

The current study aims to directly test how L2 learners process clitic structures in Spanish. VanPatten (1984) was the first major study to consider L2 processing of Spanish preverbal clitics. Stemming from prior research into learner universals in word order strategies (Bever, 1970; Slobin & Bever, 1982; see also LoCoco, 1982, 1987), VanPatten tested college-aged L1 English learners of Spanish on two auditory comprehension tests involving a picture-matching task. In the first test, which is directly relevant to the present study, he used sentences in which only direct object clitics and not the full noun phrase were present, such as in (3):

(3)	***Lo***	*invitan*	*ellos*	*al cine.*
	Him-OBJ	invite-3RDPLUPRE	they-SUBJ	to the movies.
	They invite him to the movies.			

VanPatten found that both first- and second-semester learners overwhelmingly interpreted the clitics as agents of the action, and from this proposed that L2 learners use a universal strategy that identifies the first noun in a sentence as the subject. This study only involved learners in the early stages of L2 acquisition with English as their L1, leaving open the question of how L2 learners of other L1s and at later developmental stages process preverbal clitics. We will discuss his theory in greater detail in the following section.

Various studies have stemmed from VanPatten's seminal work. Lee and Malovrh

(2009) examined the process by which advanced L2 Spanish learners move away from SVO toward OVS processing of sentences such as (3). For the first time, this study considered learners of various levels of proficiency (determined by an independent measure). Lee and Malovrh found that the highest-level learners were using OVS processing 84% of the time as opposed to the lower-level learners, who were using OVS processing between 50% and 58% of the time, providing support for the proposal of a developing system in regards to accurate OVS processing. What is most interesting is that the authors affirm that the third-person accusative pronouns (*lo, la, los, las*), of which the singular forms are the pronouns employed in the present study, were the most difficult for their participants to process across all levels, stating that this is perhaps due to their multifunctionality as both object pronouns and definite articles (unlike the first- and second-person object pronouns, which have only one function in Spanish). Finally, Lee and Malovrh conclude that object pronouns, and in particular third-person forms, are acquired late in L2 Spanish acquisition, which clarifies the need to examine L2 learners of higher proficiency levels.

Studying for the first time learners with an L1 other than English learning L2 Spanish clitics, Isabelli (2008) examined the results of L1 Italian (in which preverbal clitics exist but are marked) and L1 English learners of Spanish on an aural sentence interpretation task similar to the one used in VanPatten (1984). Isabelli found that the L1 English first-year learners of Spanish had a high error rate on OVS structures such as in (3) above. She compared these participants to the first-year L1 Italian learners of Spanish and found that they showed a high rate of correct subject identification for OVS structures. This suggests that L1 transfer was at play. Yet, the L1 Italian learners of

Spanish did not score as well on the OVS structures as on the SVO structures, which may indicate a preference for a universal first-noun strategy. Isabelli argued that there is a possibility that both universal strategies of the type suggested by VanPatten (2004) and L1 transfer of processing strategies are involved, and that transfer does not occur until the learner has reached a certain level of proficiency. However, she did not test her participants for overall Spanish proficiency. It may be that the L1 Italian participants were more highly proficient than the L1 English participants.

Most recently, Tight (2012) investigated how strong the tendency is for L1 English learners of Spanish to interpret postverbal subjects as objects when preceded by an ambitransitive verb (a verb that can both have a complement or not as in "to understand" and "to understand something"). For example, participants were presented with sentences of two types (SV word order and VS word order), as shown in (4a-b):

(4a) *La mujer* *no comprende.*
The woman-SUBJ does not understand-VERB.
The woman does not understand.

(4b) *No comprende* *la mujer.*
does not understand-VERB the woman-SUBJ .
The woman does not understand.

The results revealed that learners in their first, third, and fifth semesters of language study were not above chance in correctly interpreting sentences that were of the structure VS. Tight concludes that learners at low levels of proficiency appear to be using a word order strategy to interpret sentences, even in the absence of an object (pronominal or not).

While the studies reviewed previously have provided a strong base for determining how L2 learners process Spanish clitics, there are still many unanswered questions. As many of the studies have shown, proficiency appears to be an important variable, yet many studies have only included lower-level learners (e.g., Isabelli, 2008;

VanPatten, 1984), or have examined more proficient learners without measuring proficiency objectively (e.g., Isabelli, 2008; Tight, 2012). By including learners of multiple levels, Lee and Malovrh (2009) were able to show that accuracy in processing OVS sentences with preverbal clitics does improve as proficiency increases. However, the inclusion of multiple language groups is a crucial element in order to tease apart the variable of L1 influence. Thus far, only Isabelli (2008) has specifically investigated L2 Spanish learners from L1 backgrounds other than English and their processing of preverbal clitic pronouns, but without controlling for overall proficiency. The present study addressed these research gaps.

Four Theoretical Predictions of the L2 Processing of Argument Structure

Before describing the present study, we discuss the current state of knowledge in light of four theories of how learners process argument structure in their L2: the Input Processing Model (VanPatten, 1996, 2004), the Unified Competition Model (MacWhinney, 2005, 2012), the Amalgamation Model (Hernández et al., 1994), and the Associative-Cognitive CREED (Ellis, 2006a). VanPatten's Input Processing Theory was derived from research examining the same linguistic structure that the present study examined, and is thus most directly comparable. According to VanPatten's Input Processing Model, which is primarily concerned with the initial stages of L2 acquisition, learners begin by processing their L2 using universal parsing principles. Based on the results from VanPatten (1984), he concluded that the strategy of assigning subjecthood to the first noun in the sentence may be part of a back up system for processing input. VanPatten (1996, 2004) later articulated this as the First Noun Principle.

The First Noun principle predicts that, regardless of L1, all incipient L2 learners would process preverbal pronominal clitics in the same way. In the present study, this would predict that even though the L1 Romanian participants have preverbal clitic structures in their L1 and therefore have significant experience processing them as direct object pronouns, the L1 Romanians at lower proficiency levels would identify the first noun of the sentence as the subject due to the First Noun Principle. VanPatten's (1996, 2004) theory surmises that over time, the ability to properly process preverbal clitics might evolve as L2 proficiency increases. However, since VanPatten only tested L1 English learners of Spanish of low proficiency (i.e., speakers of a language with a rigid SVO word order), his results alone are not sufficient to make conclusions regarding whether all types and levels of learners employ a universal first noun strategy. Gass (1989) found supporting evidence for the First Noun Principle when she tested L1 English learners of Italian on assigning subjecthood. However, these learners relied more on the animacy of the nouns in the structures presented than on word order to determine subjecthood. This suggests that, instead of a universal processing strategy, as VanPatten (1984) had proposed, other factors such as the structure of the L1 may influence argument structure processing in the L2.

In addition to Gass (1989), there is a large body of research that has suggested that processing strategies can be directly transferred from the L1. Working from a connectionist perspective, MacWhinney and colleagues proposed the Competition Model (Bates & MacWhinney, 1979, 1982; MacWhinney, 1987, 1989, 1992). The Competition Model (currently known as the Unified Competition Model, MacWhinney, 2005, 2012) is a language-processing model based on many-to-many form-function mappings.

According to this model, languages have various cues that help language users assign agent status in a sentence. For example, in (5), preverbal positioning, animacy, verbal agreement morphology, and sentence initial positioning all lead the reader to believe that *the boy* is the subject/topic/agent/actor of the sentence:

(5) The boy shatters the window.

These cues mark function probabilistically, however. In (6), the cues for subjecthood of animacy and verbal agreement morphology are of no aid. It is the cue of preverbal position of *the wind* that tells the reader it is the subject:

(6) The wind shatters the window.

With all of the possible cues available in a given language, the Competition Model posits that sentence interpretation occurs by way of competition and cooperation between these cues and is determined by their strength, validity and reliability, while the extended Unified Competition Model considers the summation of cues and cue support, but this distinction goes beyond the present study. Of greatest relevance here, cross-linguistic differences in form-function mappings lead to variation in the strength of the cues across languages. The cues that are the most frequent and reliable (i.e., valid) for a particular language will have larger cue weights for that language. For example, in English, word order is a very strong cue for subjecthood, as shown in (5). However, in Spanish, utterances with postverbal subjects are frequent and possible, such as in (7):

(7) *Llegó* ***María***.
[arrived-3RDSINGPAST María-SUBJ]
María arrived.

In addition, Spanish allows for null subjects, which further complicates the matter for speakers of L1s in which explicit subjects are required, such as English. Therefore, cues for subjecthood such as word order are less reliable in Spanish than in English, a

challenge that we address in the present study. Cues such as animacy or verbal agreement morphology are more robust.

According to the Competition Model, learners first begin with L2 cue weights that are close to those for the L1. Slowly, these cue weights must be "retuned". Where languages have no corresponding form-function mappings, L2 learners can only transfer the meanings, and then start constructing new form-function mappings (MacWhinney, 1987). L1 English learners in the present study must retune their cue weights, discounting the weight of word order to allow for sentences such as (1a) above (*lo besa la niña* 'the girl kisses him'). In contrast, because German, like Spanish and Romanian, allows for more variation in word order than English, L1 German learners of English rely more on agreement and animacy than on word order (Bates et al., 1984; Kilborn, 1989; MacWhinney, Bates, & Kliegl, 1984). These results suggest that transfer of L1 cues is a powerful mechanism in SLA.

Thus, the L1 English learners in the present study are likely to rely heavily on word order cues, which are strong, valid, and reliable in English, even when they are processing preverbal clitics in Spanish, where word order does not cue thematic interpretation as reliably. In contrast, the L1 Romanian learners are expected to transfer their reliance on case and animacy cues, which are stronger and more reliable in Romanian, and which match the cue weightings of Spanish closely. Interestingly, this is a hypothesis about how English and Romanian differ in their overall cue weightings for interpreting argument structure, regardless of how individual sentences are structured. This suggests that there may be generalized differences in how L1 Romanian and L1 English learners process argument structure in Spanish, in addition to a specific

advantage for the learning of preverbal clitic structure. As individual learners' proficiency increases, however, the L1 English learners are expected to learn the cue weightings for Spanish, converging on the behavior of native speakers of Spanish as well as that of the L1 Romanian learners. Thus, we expect greater differences between the L1 English and L1 Romanian groups at low proficiency than at high proficiency. Although VanPatten's model also predicts that learners will acquire L2 strategies over time, the Unified Model highlights the role of the L1 early on in this process, and suggests a different starting point for L1 English and L1 Romanian learners.

Hernández et al. (1994) proposed an intermediate model of online aural sentence interpretation, which they adapted from an earlier version of the Unified Competition Model and dubbed amalgamation. Hernández et al. define amalgamation to be when a bilingual listener applies a single set of strategies to both of his or her languages. This set comes out of the merger of the bilingual's two cue hierarchies, and involves a combination of L1 to L2 transfer (forward) and L2 to L1 transfer (backward). Hernández et al. (1994) tested early bilinguals on choosing the agent of a sentence. The data revealed that these participants' choice profiles were more in between, as the authors put it, the monolingual choices for each respective language, suggesting that bilinguals are actively using both languages during online processing in order to be most optimal. The authors suggest that the Unified Competition Model, which treats the interaction of cue validity and cue cost as specific to each language, should be modified by including a third system of cue validities and cue costs that is unique to the bilingual condition.[1]

[1] This is most relevant for the high-proficiency learners in the present study, suggesting that they will converge towards a hybrid system. Since the L1 and L2 are most different for the L1 English group, this

The fourth theory we consider here, the Associative-Cognitive CREED (Ellis, 2006a), adds to the above discussion a detailed account of how less salient structures, such as preverbal pronominal clitics, are acquired. As in the Competition and Unified Models, Ellis proposed that when processing the L2, learners use what they can from the L1, but they adapt this strategy over time to incorporate the new forms, increasingly aligning their processing with the L2 system. However, although increased exposure to particular structures would aid learners in their acquisition due to learned attention to particular cues, less salient structures such as preverbal pronominal clitics may be overshadowed by more salient cues such as the animacy of verbs or nouns and may not be acquired. To explain this, Ellis incorporated the concept of perceived strength of cues, which plays a determining role in how much learning results from the input containing such cues. Ellis noted that the majority of the form-meaning mappings that are challenging for L2 learners to acquire are those that have low salience in the speech stream, such as the third person singular present tense grammatical morpheme '–s' in English, bound inflectional morphemes, and grammatical function words, which are typically short and unstressed, and thus difficult to perceive. Preverbal Spanish clitics fit this description well. By testing a range of proficiency levels in this study, we would be able to observe how closely the higher-proficiency learners approach nativelike behavior as experience accrues. In particular, we might expect the L1 Romanian group to exhibit sensitivity to these more subtle cues at lower proficiency levels than the L1 English group, because preverbal clitics are already important for processing Romanian. Thus, the L1

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suggests that we might expect lingering differences between the L1 English and L1 Romanian groups even at the highest level of proficiency.

English group may exhibit steeper improvement at higher proficiency, because they lack the L1 Romanian group's prior sensitivity to the clitics. To date, however, there has been little research that tests the claims of the Associative-Cognitive CREED in general (see Ellis & Sagarra, 2010), and none that considers the acquisition and processing of preverbal clitics in particular.

In sum, Input Processing Theory predicts that all beginning language learners regardless of L1 background will process preverbal object clitics as subjects at first, but makes no predictions about what happens with more advanced proficiency. On the other hand, the Unified Competition Model, the Amalgamation Model, and the Associative-Cognitive model together suggest that the L1 Romanian group will start at an advantage, compared to the L1 English group, because Romanian and Spanish are typologically similar with regard to preverbal clitics, but English differs. Nonetheless, the L1 English group should perform similarly to the L1 Romanian group at higher levels of proficiency. However, due to the low salience of preverbal clitics (they are short and unstressed phonologically), the L1 English group may still not achieve the same degree of accuracy as the L1 Romanian group or Spanish native speakers, according to these latter theories. Under all models, both groups of learners are expected to perform similarly with regard to SVO sentences without preverbal clitics, across all proficiency levels. Yet, each theory predicts a slightly different scenario for how highly proficient L2 learners process OVS sentences with preverbal clitic structures.

Research Aims

In the present study, we compared L1 English and L1 Romanian learners of Spanish in order to directly test the extent to which the L1 plays a role in L2 processing

of argument structure. In both groups we tested learners across a range of proficiency levels to determine the trajectory of learning for individuals from typologically similar and typologically different L1 backgrounds. Primarily following the predictions of the Unified Model, and somewhat the predictions of the Associative-Cognitive Theory, but expanding upon an exclusively universal set of processing strategies as proposed by Input Processing and the combined processing strategy proposed by the Amalgamation Model, we put forward the following hypotheses:

(1) The L1 Romanian learners of Spanish will be more successful (i.e., accurate) at lower proficiency levels in processing preverbal clitics than the L1 English learners of Spanish due to the Romanian learners' greater experience with clitics stemming from their exposure to and use of them in their L1.

(2) At higher proficiency levels, potential differences between the two L1 groups should be reduced, according to the Unified Model and the Associative-Cognitive theory, in that with increased exposure the L1 English speakers will overcome L1 interference and L1 biases.

Methodology

Participants

The participants for the study were 65 L1 English learners of Spanish, 72 L1 Romanian learners of Spanish, and 36 Spanish-speaking monolingual controls. The participants' ages ranged from 18 to 56, and there were 126 females. The L1 English learners hailed from two main constituencies: third- and fourth-year learners of Spanish and professional, post-graduate, and graduate learners of Spanish from two North American universities. The basic language teaching practices employed at these

universities were based on the tenets of Input Processing Theory. Instructors gave the students comprehensible input highlighting specific forms, but with primary focus on communication. However, most of the participants had completed their basic study of Spanish at other institutions, and most had already moved beyond studying grammar to studying the fields of literature or linguistics in Spanish before enrolling at these universities. This fact renders the inclusion of learner variables such as immersion time in the analysis even more important. The L1 Romanian learners were recruited from individuals studying at a Spanish language institute in Bucharest, Romania. The style of teaching in the Spanish language institute was also communicatively based. The majority of these participants had completed the basic level of study of Spanish at this institute. However, they were enrolled in courses that had as a goal the successful completion of a standardized proficiency test. The Romanian participants were college-age and professional, post-graduate first- through fourth-year learners of Spanish.[2] At the time of the study, all of the L2 participants had already been taught about preverbal clitic pronouns. After completion of the tasks, the data for one Romanian and one Spanish monolingual participant were lost due to a technical error. One Romanian participant reported an L1 other than Romanian and was also excluded. All of the learner participants scored 88% correct or above on the post-experiment vocabulary test, which included 122 items, only 30 of which were used in the auditory sentence processing task.[3]

[2] It is important to note here that the two learner groups showed no significant differences in Spanish proficiency, as reported in the descriptive statistics in the results section.

[3] In fact, only five participants scored below 93%. We are thus confident that the participants were sufficiently familiar with the target items. The low rate at which semantically unrelated distractor pictures

The mean score was 98 out of a total of 122 with a standard deviation of 2.86, which indicated that they all had sufficient knowledge of the Spanish words used in the present experiment to participate in the study. To provide a descriptive baseline for the study, data were also collected for 36 L1 Spanish-speakers from a monolingual community in northeastern Spain (see the descriptive statistics section under results for further detail).

Materials and Experimental Task

Processing of preverbal clitics was tested using an auditory sentence processing task. The participants sat 75 centimeters away from a Dell computer screen, upon which the response stimuli were presented using the program Experiment Builder from SR Research, and heard Spanish sentences through headphones. The aural stimuli were pre-recorded by a native speaker of Spanish using a Marantz professional portable solid-state recorder and Audio-Technica (ath-m40fs) studiophone microphone. First, the participants saw a fixation point on the computer screen. Then they saw a four-picture display while they simultaneously heard the sentence through the headphones. Then, with no time limit, they were asked to choose the picture that they felt was best described by the sentence they had just heard. The dependent variable was response accuracy (see below for more detail). The procedure is shown in Figure 1.

FIGURE 1

Each participant was presented with a total of 16 experimental sentences (eight per condition), and 64 filler sentences. These items were randomly presented following five practice sentences. The experimental sentences appeared in one of two conditions: an

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were selected in the sentence processing task (about 5%, comparable to the native monolingual Spanish speakers) reinforces this confidence.

SVO word order condition and an OVS word order condition with a preverbal object clitic, and were written in conjunction with a native speaker of Spanish. The SVO condition sentences were of the type: adverbial phrase, full noun phrase, verb, object marker, full noun phrase, prepositional phrase, as in (8a). The OVS condition sentences were of the type: adverbial phrase, direct object pronoun, verb, full noun phrase, prepositional phrase, as in (8b):

(8a) *Por la tarde* *el muchacho* *llama* *a* *la muchacha* *en la oficina.*
[In the afternoon the boy call-3RDSINGPRE to the girl in the office]
In the afternoon the boy calls the girl in the office.

(8b) *Por la tarde* *la* *llama* *el muchacho* *en la oficina.*
[In the afternoon 3RDSINGFEMACC call-3RDSINGPRE the boy in the office]
In the afternoon the boy calls the girl in the office.

We included the adverbial and prepositional phrases (e.g., *por la tarde* and *en la oficina* in the examples above) so as not to make the critical regions more salient than the rest of the sentence to the participant. The adverbial phrases were all common and highly frequent. A complete list of the experimental stimuli is included in Appendix A. To control for possible effects of the individual lexical items, each sentence was created in an SVO and an OVS form by reversing the subject and object NPs from the SVO version and replacing the object NP with a clitic pronoun, as illustrated by (8a-b). Each participant heard equal numbers of SVO and OVS sentences, but no participant heard both versions of any individual item. For instance, participants heard only (8a) or (8b), never both. This was to ensure that there were no practice effects.

All of the subjects and objects in the sentences were animate and singular so as to control for any animacy or subject-verb agreement cues for subjecthood, isolating word order and case as the only cues to thematic interpretation. The verbs were highly frequent and regular, and taken from the Spanish language textbook used in the basic foreign

language courses at the university from which the majority of the L1 English participants hailed, *Mosaicos* (Olivella de Castells, Guzmán, Lapuerta, & Liskin-Gasparro, 2010). All of the vocabulary was also based on the vocabulary used in the textbook, and derived from the peninsular dialect of Spain, the dialect taught in the language institute where the L1 Romanian learners studied. Thus, both groups were familiar with the vocabulary. In addition, we controlled for the gender of the subject and object in order to not bias the participants' processing toward a particular gender, in line with results from Lee and Malovrh (2009), in which the gender of the clitics was found to be a significant factor in how participants processed OVS sentences. The stimuli included four sentences for each possible combination of genders for the subject and object. In addition to the experimental sentences, participants heard filler sentences that were similar in length and difficulty to the experimental ones. The filler sentences were critical stimuli for two separate experiments, and are not analyzed here.

The same artist created all of the pictures in order to maintain continuity in style. In this section we focus on the 64 pictures corresponding to the 16 critical trials. The pictures were black line drawings on a white background. Each picture was modified to a standard resolution and size, of the dimensions 280 × 280, and was encoded in Tagged Image File Format (TIFF). For every sentence (both word orders), there were four picture conditions. Two of the conditions were the critical pair, in that they included the correct action and actors, and two were total distractors in that they had either incorrect actions or actors. Examples of the four picture conditions can be found in Figure 2. For the above example sentence, *Por la noche la abuela busca al abuelo en la calle* (At night the grandmother looks for the grandfather in the street), Figure 2.1 was the correct picture,

Condition 1. The pictures for Conditions 2, 3, and 4 were the incorrect pictures. For Condition 2, as in Figure 2.2, the actors switched roles, but the action was the same. For Condition 3, the roles were the same, but the actors or actions were different from the sentence stimulus, as in Figure 2.3. For Condition 4, neither the roles nor the actors or actions were the same as those in the sentence stimulus, as in Figure 2.4. The locations of the correct picture and the various distractors were counterbalanced so as not to create a bias for a particular picture location. The complete set of pictures can be found in Appendix B.

FIGURE 2

In order not to draw participants' attention to the people involved in the action or to the action itself, we altered the semantic change in Conditions 3 and 4 throughout the stimuli in both tasks such that half of the sentences had changes of subject and half had changes in the verb. For example, in the case of the same sample sentence, Conditions 3 and 4 could have a verb change (e.g., *abraza* 'hugs' instead of *busca* 'looks for') or a subject change (e.g., *la nieta* 'granddaughter' instead of *la abuela* 'grandmother'), as shown here.

We conducted a separate picture norming study to ensure that the pictures were interpreted as representing what they were intended to represent. In this study, we showed 107 native English speakers just the pictures from the experimental task, and asked them to write what they thought one person was doing to the other. The judgments of these participants, based exclusively on the pictures and with no linguistic guidance, showed correct identification of the agents and patients at or above 70% of the time for 48 out of 64 (75%) of the pictures. The pictures thus varied somewhat in their ease of

interpretation. This variability was captured via the random effects terms for Item in the analyses (see below). In addition, it was reasonable to keep all items in the final analysis because every participant saw the same pictures.

Assessment Measures

All participants completed a language history questionnaire in their L1 that asked them about the languages they use in their daily lives, which is included in the Online Supporting Documentation. This information was used to gain information about participants' learning experiences and to control for any differences in language use patterns among participants. Specifically, the questionnaire determined the participants' L1, languages spoken at home and early in life, languages studied in school, languages that they could read, write, and speak, the duration and location of any Spanish immersion experiences, and which language was most comfortable for them. For the learner groups, the questionnaire also revealed a participant's age of first exposure and length and time of study or residence in a Spanish-speaking country.

In addition to the language history questionnaire, both learner groups performed a 68-item Spanish proficiency test, which consisted of five sections from the Diploma de Español como Lengua Extranjera (DELE) exam: a basic, intermediate and advanced level grammar section, a reading comprehension section, and a listening comprehension section (see http://www.dele.org/). For this test, participants received one point for each correct answer, and zero points for each incorrect answer. The results were scored as a proportion of 100. There was no cut-off since we desired a participant pool with a large range of abilities. A vocabulary test, mentioned above, was also included. There were 122 items on the vocabulary test: 40 verbs (including the eight verbs used in the present

study), eight adverbs, and 74 nouns (including the 22 nouns used in the present study). The participants matched the Spanish word to its equivalent in their L1. There was no time limit imposed on this test.

Procedure

Participants in the two learner groups were first given time to study a list of the target vocabulary words from the sentence processing experiments. While the vocabulary for the experimental stimuli were selected from a basic textbook, so as to ensure that the participants knew the words, this period of review was included in order to minimize any effect of lexical familiarity on the participants' performance. No time limit was given, but no participant took more than 10 minutes to review the vocabulary. This review period was omitted for the native Spanish speakers. Following this review, the participants completed the language history questionnaire (approx. 5 min), the proficiency tests (approx. 10-20 min), the sentence processing task (20-40 min), and the vocabulary test (10 min).[4] The entire experiment lasted between one and one-and-a-half hours.

Analysis

Accuracy on the critical trials from the sentence processing task was analyzed for the trial-level data, with the correct answers coded as 1, and incorrect as 0. Trials on which participants chose one of the semantically incongruous distractors were omitted, because this is likely to indicate comprehension problems that are unrelated to the

[4] One anonymous reviewer mentioned that having the participants take the vocabulary test after the experimental task might have been problematic for assessing whether or not the participants truly knew the vocabulary on the task. We address this in the limitations section at the end of the article.

processing of the preverbal clitic, which was our primary focus (only 5.7 % of the data were omitted across groups).

We used a mixed-effects logistic regression analysis to capture the grouping of observations both by participants and by items via the random effects structure. Logistic regression is well suited to analyzing categorical outcomes such as this (see Jaeger, 2008). In addition, it allows us to treat variables such as Proficiency as continuous alongside the discrete variables such as Condition (SVO or OVS) and First Language (English or Romanian), as well as all interactions of interest. The parameter estimates were obtained by using the Laplace approximation of the maximum likelihood function (Harding & Hausman, 2007) to determine the best fit.

Separate models were constructed for the learners and the Spanish native speakers. For the learner model, the fixed-effects predictors were Spanish Proficiency (based on the adapted DELE test), Immersion Time in a Spanish-speaking country (from self-reports in the language history questionnaire), First Language (English or Romanian), and Sentence Condition (SVO or OVS). The self-ratings of proficiency were not included due to their significant correlation with the scores from the independent and more objective measure of proficiency employed here (Pearson $r = .43$, $p < .01$). Proficiency was centered at the mean. The mean number of months of Immersion was 4.42, but 67 of the 136 learners reported zero months of study abroad. Therefore we did not center this variable on another value, but rather used the participants' reported values. Immersion time correlated weakly with proficiency (Pearson $r = .28$, $p < .01$). It was included to capture the possibility that immersion experience makes a unique contribution to learners' ability

to process preverbal clitics.[5] Condition and First Language were coded with reference levels of SVO and English, respectively, in order to test the specific hypotheses listed above. The two-way interactions between Condition on the one hand, and each of Proficiency, Immersion, and First Language, were also included to test our primary hypotheses, that is, whether the latter systematically modulate the difficulty of processing preverbal object clitics. The model of the monolingual data included only Condition, coded as for the learners, as the remaining variables were not relevant for the native speakers.

In both models, we used the maximal random effects structure based on the design (Barr, Levy, Scheepers, & Tily, 2013). Since each sentence occurred in each condition (though no participant heard both versions of a sentence), with minimal differences in lexical content (see Appendix A), the by-item random effects correspond to these sentence pairs. By-subject and by-item slopes for Condition were included in all models, and for the learner model, by-item slopes for the learner characteristics Proficiency, Immersion, and First language, as well as their two-way interactions with Condition, were also included.

Results

Descriptive Statistics

The overall mean proficiency score on the adapted DELE test was 69.06 out of 100 (*SD* = 15.17) for the 137 learner participants. These statistics, organized by language group, can be found in Table 1, which also includes the results from an independent-samples *t*-test, showing that overall the two learner groups were not significantly

[5] Refitting the model by omitting Immersion Time yielded an identical pattern of results.

different in Spanish proficiency. The overall mean for the 137 learners' immersion time in a Spanish-speaking country as measured in months was 4.38 (*SD* = 9.3). However, the majority of the participants had less than 3 months of immersion time. There were 67 learners with no time spent abroad (18 of whom were from the L1 English group).[6] The means by L1group are also shown in Table 1. An independent-samples *t*-test showed that the L1 English group had spent significantly more time immersed in a Spanish-speaking setting than the L1 Romanian group, but even among the L1 English group 45% had spent 3 months or less in immersion.

TABLE 1

Descriptive statistics from the experimental task are shown in Table 2, organized by condition and language group. The Spanish monolingual group was more accurate overall than the other two language groups, as expected. In addition, the L1 Romanian group seemed to be performing better, particularly in the OVS condition. However, the data shown in Table 2 do not clearly reveal the effects of Proficiency, First Language, and Immersion Time. We therefore turn now to more detailed statistical analysis of the results.

TABLE 2

Spanish Monolinguals

The estimates for the fixed and random effects for the monolingual Spanish speakers are shown in Table 3. Recall that Condition was coded with SVO as the

[6] One L1 English participant had spent 7 years abroad. We did not eliminate this participant from the study, however, because her proficiency data matched that of a L1 Romanian participant, who was not an outlier in accuracy. Refitting the model without this participant yielded identical results.

reference level. The highly significant positive intercept indicates that monolinguals' accuracy on SVO sentences was near ceiling, as expected, and there was no significant effect of Condition (SVO vs. OVS). However, this model included only trials in which the correct picture or syntactic distractor was selected (picture conditions 1 and 2 above), in order to directly test the effects of the preverbal clitic. To ensure that the exclusion of trials on which participants selected a semantic distractor was not systematically related to the sentence Condition, we modeled the likelihood of choosing the semantic distractor (picture conditions 3 and 4, above), as compared to choosing the correct or syntactic distractor. The Spanish monolinguals selected the semantic distractor on only 32/560 trials (5.71%), and no significant effect of Condition was found.

TABLE 3

L2 Learners

The fixed and random effects estimates for the model featuring the L2 learner data are shown in Table 4. Again, the variables are Spanish Proficiency, Immersion Time, First Language (English or Romanian), and sentence Condition (SVO or OVS). The reference level for Condition is SVO, and the reference level for First Language is English.

TABLE 4

A significant main effect of First Language shows that the L1 Romanian group responded more accurately than the L1 English group overall. This is consistent with the hypothesized advantage due to the typological similarity between Spanish and Romanian, but we did not detect any interaction between First Language and Condition. That is, controlling for proficiency, a significant advantage for the L1 Romanian group over the

L1 English group was observed for both the SVO and the OVS sentences, and the size of this advantage did not differ across sentence types.

Note that the model compared the size of the L1 Romanian advantage on the logit scale, or log odds, which linearizes probabilities on a scale bounded by ±infinity. This is particularly appropriate when the probabilities of a correct answer (or proportion correct) are greater than .7 or less than .3 (Jaeger, 2008), as we find here, because the probability scale is compressed as it approaches its endpoints, 0 and 1. Thus, while most learners in the present study performed close to ceiling on the SVO sentences (mean 91% correct for the L1 Romanian group, and 88% correct for the L1 English group, see Table 2), we are still able to detect a significant advantage for the L1 Romanian group for the SVO sentences that, on the logit scale, is comparable in size to that observed for OVS sentences, even though this latter difference appears to be larger based on the proportion of correct responses (68% vs. 58%, Table 2). Figure 3 shows the estimated accuracy for L1 English and Romanian participants with average Spanish proficiency, in each condition. The estimates are back-transformed to probabilities, for ease of interpretation.

FIGURE 3

We did, however, detect a significant interaction between Condition and Proficiency, shown in Figure 4. The significant coefficient for Condition shows that, at an average level of proficiency, participants respond more accurately to SVO sentences than to OVS sentences with a preverbal clitic. This is consistent with the literature discussed above (e.g., Van Patten, 1984), and it is expected since SVO is the most common word order in Spanish as well as in English and in Romanian. While even the lower-proficiency participants performed well in the SVO condition, accuracy in the SVO

condition did increase with proficiency (cf. the significant main effect of Proficiency). However, the interaction shows that the improvement in the OVS condition is considerably more dramatic.

FIGURE 4

Given the much more substantial difference in performance across conditions at lower proficiency levels, we explored the possibility that the L1 Romanian group might show an OVS-specific advantage at lower proficiency by fitting a model with a 3-way interaction between Condition, Proficiency, and First Language. This interaction did not reach significance ($p > .4$). Note that the learner model shown in Table 4 also revealed no main effects or interactions with Immersion Time. The amount of time spent immersed in a Spanish-speaking country did not affect processing accuracy of either type of sentence for the learner participants, despite the large amount of variance in the time participants spent immersed in Spanish, which is consistent with previous research on the effects of study abroad on grammatical accuracy (e.g., Collentine, 2004). The variable of immersion time, however, remained in the model since it controlled for the possibility that immersion may lead to qualitative differences in processing strategies among learners of the same overall proficiency level.

Just as with the monolingual results, we separately modeled whether the likelihood of learners choosing a semantic distractor varied systematically as a function of any of the predictors examined here. The learners chose one of the semantic distractors a total of 124 times, or 5.7% of the total trials (2176), the same proportion of the data as for the monolinguals. A mixed-effects regression including main effects for Condition, First Language, Proficiency, and Immersion Time revealed, not surprisingly, that more

proficient learners were less likely to choose a semantic distractor (B = -0.04, SE = 0.01, z = -3.35, $p < .001$), but no other effects reached significance.

Discussion

Our hypotheses focused on the roles of L1 and proficiency in L2 processing of Spanish clitic structures. In light of the four theories discussed in our review of the extant literature, the important findings from the present analysis are twofold. First, one hypothesis advanced at the beginning of this study was that learner groups of two different L1s would perform differently from each other on accuracy, specifically on the OVS structures (i.e., the L1 Romanian participants would perform more accurately than the L1 English participants). The second is that proficiency was strongly related to performance in both L1 groups.

Concerning the first finding, the L1 of a participant did have a significant impact on processing but, interestingly, there was no significant interaction between Condition and First Language. That is, the advantage for L1 Romanian participants occurred for both SVO and OVS structures. This does not necessarily indicate that there has been no direct transfer of a processing strategy specifically for the OVS structure from the L1 to the L2 for the L1 Romanian group; indeed, participants in this group performed substantially better than the L1 English learners on sentences involving preverbal object clitics. What we have observed, however, is that this advantage generalizes to interpreting argument structure in Spanish SVO sentences as well. We cannot, of course, rule out that other similarities between Romanian and Spanish contribute to this advantage for argument structure. We note here that Spanish proficiency was controlled for in two ways, through matching the two L1 groups and by inclusion of a proficiency

measure in the logistic regression. Thus, the L1 Romanian advantage was not simply an overall advantage in learning Spanish, and we can localize the L1 Romanian advantage to argument structure. As the critical difference between English and Romanian in terms of argument structure is the fact that preverbal object clitics occur in Romanian, but not English, it is likely that L1 typology is the major contributor to the present results.

This result is thus consistent with Ellis' (2006b) Associative-Cognitive framework and MacWhinney's Unified Model (2005, 2012). Additionally, however, all of the learners were more accurate on the SVO than on the OVS structures, whereas no difference was observed for the native Spanish speakers. This is consistent with a universal First Noun Principle, as in the Input Processing Theory (VanPatten, 1996, 2004). The present study thus does not unambiguously allow us to attribute this particular finding to a universal strategy, per se, because SVO is the dominant word order in all three languages being dealt with here. Better performance on SVO sentences may simply be a result of all learners favoring the most robust L1-based strategies, an interpretation compatible with the Amalgamation Model (Hernández, et al., 1994)

It is nonetheless interesting that the L1 Romanian group's performance was significantly lower on the OVS than on SVO sentences. Despite the Romanian learners' demonstrated advantage over learners with no L1 experience of OVS structures or preverbal clitics, the OVS condition appears to be more challenging than the SVO condition for all learners. The Associative-Cognitive model (Ellis, 2006b) offers an explanation in that it takes into account structures of low salience such as object clitics. While we have robust evidence that Romanian speakers' experience with L1 object clitics does facilitate their acquisition of this structure in Spanish compared to the L1 English

group, this experience does not appear to be enough to overcome the comparative difficulty of learning the low-salience formal properties of clitics in Spanish, as compared to the formally simpler SVO condition.

In regards to our second hypothesis, we found that learners' proficiency level had the most significant impact on their processing of sentences with preverbal object clitics and postverbal subjects. Although this finding alone may not be surprising, it is nevertheless extremely important in that it highlights the need to disentangle the unique effects of proficiency and L1 (e.g., Isabelli, 2008). While accuracy increased across both conditions in the present study, the improvement was especially pronounced for the structures with preverbal clitics (i.e., OVS sentences).

The observed improvement on OVS structures with increased proficiency can be explained within the frameworks of the Unified Competition Model and the Associative-Cognitive model (since neither Input Processing Theory nor the Amalgamation Model address it explicitly), attributing it to increased exposure and to experience with the L2. However, both of these models predict that the L1 will exert a heavy influence on lower-proficiency learners' processing. In the Associative-Cognitive model, lower-proficiency learners' processing of the present stimuli is expected to be shaped by the entrenchment of L1 word order that has not yet been overcome, and under the Unified Model the lower accuracy in the OVS condition can be understood as a result of overweighting the word order cue based on its role in the L1. However, it was not just the L1 English participants who showed lower accuracy on the OVS structures. The Romanians showed a similar pattern despite the fact that the typological similarity between Romanian and Spanish would lead to an early L1 bias that would support *accurate* responses in the OVS

condition. If lower proficiency learners transfer L1 processing strategies, but favor the dominant L1 patterns (SVO in both cases), then L1 transfer of strategies may still be playing a role, but comparison with learners with an L1 in which SVO does not dominate will be required to determine whether L1 transfer of strategies is at work in this way. Although the Unified Competition Model takes into account proficiency, a more universal processing strategy account is needed to more readily explain this interaction.

One possible alternative interpretation of the results might be that the Romanian participants were processing the preverbal clitic and postverbal subject structures, such as *Lo besa el abuelo*, as clitic doubled structures. If this were the case, we might expect the L1 Romanian participants to perform more poorly on sentences in which the subject and object were of the same gender and could thus be clitic doubled, and they might thus show an advantage over the L1 English group on sentences in which the gender of subject and object differed. To examine this possibility, we therefore categorized each item from the experiment as either "same gender" (both constituents had the same gender) or "different gender" (both constituents had different genders), and ran two one-way ANOVAs that included gender category as the independent variable and accuracy on each item as the dependent variable for each language group. The results from this analysis are presented in Table 5. There were no significant differences between same-gender and different-gender items for the L2 learners. Thus, there appears to have been no disadvantage for the L1 Romanian learners based on a possible clitic doubling interpretation for the same-gender items.

TABLE 5

Conclusions

Taken together, the present study showed that beyond the sentence condition, learners' L1 background and their L2 proficiency were by far the most significant predictors of accuracy, with the effects of Proficiency modulated by condition. This allows us to conclude that learners' proficiency level plays an important role in their processing accuracy of Spanish preverbal pronominal clitics and postverbal subjects. We also found that the L1 played a significant role in accuracy. Learners who had experience in their L1 (Romanian) with preverbal clitic OVS structures were more accurate in their interpretation of similar structures in L2 Spanish, after controlling for proficiency. This points toward an experience- or usage-based theory of language acquisition (e.g., MacWhinney, 1997, 2005, 2012; Ellis, 2006a, b). Interestingly, the L1 Romanians' advantage on SVO sentences, which was not attributable to general differences in proficiency, suggests that the processing strategies associated with OVS experience in Romanian may also lead to an advantage in processing argument structure in other types of sentences. This does not mean that the advantage is not due to structure-specific processing strategies. In fact, our results strongly support this interpretation. It does, however, raise new questions about how crosslinguistic differences in the possible realizations of argument structure (e.g., Romanian and Spanish offer both SVO and OVS with preverbal clitic structures, but English offers only SVO) may lead to changes in a whole constellation of strategies for processing argument structure, leading to the results reported here.

While these results support experience-based theories, the finding that all learners nonetheless performed better on SVO than on OVS sentences leaves open the possibility of universal processing strategies (although, as discussed above, our findings do not

unambiguously support this interpretation). Thus, while the present results do not directly contradict any of the four theories outlined above, they require a theory that takes into account both language universals and language experience over time. Of the four, the Unified Competition Model best satisfies this need, because it allows for cues to be acquired from many sources, including both universals and accumulated experience.

This study has contributed to existing research on L2 processing of clitic structures specifically by including and highlighting the importance of proficiency in conjunction with the properties of learners' L1s. In particular, we were able to demonstrate a processing advantage for argument structure in L1 Romanian speaking learners of L2 Spanish while controlling for overall proficiency. Further research using more sensitive measures such as eyetracking or event related potentials, or studies testing learners at other proficiency levels, may help to confirm whether OVS-related processing strategies in L1 Romanian contributed directly to the advantage on SVO sentences, or whether other factors may have been involved as well. In addition, future work that includes more sensitive assessment of learners' knowledge of the experimental vocabulary might also reveal more subtle differences in clitic processing. Although our method of analysis takes each item into account, it would be best to remove any contribution of vocabulary knowledge to participants' performance. While we detected no effects of immersion, the importance and success of immersion experiences nonetheless justify future research to assess how quickly and by what means participants arrive at their respective levels of proficiency. It is also important to note that while the two groups were matched on proficiency, the Romanian group was characterized by less immersion time and fewer overall years of study in Spanish. Finally, there is also a

possibility that the existence of OVS structures with preverbal clitics in Romanian confers a structure-specific benefit only at the earliest stages. The present study did not test beginning language learners, so we cannot yet say that L1 experience confers no structure-specific benefits, only that we have not found evidence of such benefits at a range of more advanced proficiency levels. Further, many other factors not examined here may come into play, such as self-selection, potential benefits of prior bilingualism (since many of the Romanian participants are also competent in English), or L1-L2 similarities beyond the presence of preverbal clitics in Romanian and Spanish, which are Romance languages with a fairly large shared vocabulary.

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Table 1

Descriptive statistics for Proficiency and Immersion Time by Language Group

	L1 English (n = 65)		L1 Romanian (n = 72)		t-test (two-tailed)	
	M	*SD*	*M*	*SD*	*t*	*p*
Proficiency (%)	68.11	16.44	69.92	13.99	-0.70	.49
Immersion Time (months)	6.92	11.90	2.26	5.33	3.01	.003

Table 2

Sentence Processing Task Proportion Correct, Overall and by Condition for All Language Groups

Language Group	Condition	N	*M*	*SD*
English-Spanish	SVO	65	.88	.11
	OVS	65	.58	.34
	Overall	65	.73	.20
Romanian-Spanish	SVO	71	.91	.11
	OVS	71	.68	.31
	Overall	71	.80	.17
Spanish Monolinguals	SVO	35	.94	.08
	OVS	35	.90	.10
	Overall	35	.92	.07

Table 3

Results for Sentence Processing Task by Monolinguals

Fixed Effects	Estimate	Standard Error	*Z* value	*p* value
(Intercept)	5.31	0.75	7.12	< .0001
Condition	-0.66	0.85	-0.77	.44

Random Effects	Group	Name	*SD*
	Subject	Intercept	0.93
	Subject	Condition	0
	Item	Intercept	1.26
	Item	Condition	1.34

Table 4

Fixed Effects for Sentence Processing Task by Learner Participants with Interactions

Fixed Effects	Estimate	Standard Error	*Z* value	*p* value
(Intercept)	2.97	0.27	11.11	< .0001
Condition	-2.00	0.37	-5.33	< .0001
Immersion Time	-0.01	0.02	-0.58	.56
First Language	0.97	0.35	2.80	.005
Proficiency	0.04	0.01	3.53	.0004
Condition:ImmersionTime	0.003	0.03	0.11	.91
Condition:FirstLanguage	-0.31	0.48	-0.65	.52
Condition:Proficiency	0.07	0.02	3.79	.0001
Random Effects	Group	Name	*SD*	
	Subject	Intercept	0	
	Subject	Condition	1.47	
	Item	Intercept	0.001	
	Item	Condition	0	
	Item	ImmersionTime	0	
	Item	FirstLanguage	0.51	
	Item	Proficiency	0.02	
	Item	ImmersionTime: Condition	0.04	
	Item	FirstLanguage: Condition	0.48	
	Item	Proficiency: Condition	0.03	

Table 5

ANOVA Results for Gender Patterns of Constituents

Group	df	*F*	*p* value
Accuracy L1 English	1	0.85	0.36
Accuracy L1 Romanian	1	0.32	0.57

APPENDIX A. *Auditory Sentence Processing Task Stimuli.*

PRACTICE	Por la tarde la niña golpea al niño en la sala.
Item 1 Condition 1	Por la noche la abuela busca al abuelo en la calle.
Item 1 Condition 2	Por la noche lo busca la abuela en la calle.
Item 2 Condition 1	Por la mañana el esposo busca a la esposa en la iglesia.
Item 2 Condition 2	Por la mañana la busca el esposo en la iglesia.
Item 3 Condition 1	De repente la hija abraza a la tía en el comedor.
Item 3 Condition 2	De repente la abraza la hija en el comedor.
Item 4 Condition 1	En este momento el sobrino abraza al tío en la calle.
Item 4 Condition 2	En este momento lo abraza el sobrino en la calle.
Item 5 Condition 1	Por la noche la nieta llama a la abuela desde la habitación.
Item 5 Condition 2	Por la noche la llama la nieta desde la habitación.
Item 6 Condition 1	Normalmente el hombre llama a la mujer después del trabajo.
Item 6 Condition 2	Normalmente la llama el hombre después del trabajo.
Item 7 Condition 1	Hoy el abogado comprende al testigo en la oficina.
Item 7 Condition 2	Hoy lo comprende el abogado en la oficina.
Item 8 Condition 1	En este momento el perro sigue al hombre en el bosque.
Item 8 Condition 2	En este momento lo sigue el perro en el bosque.
Item 9 Condition 1	En este instante la abuela sigue a la tía en el barrio.
Item 9 Condition 2	En este instante la sigue la abuela en el barrio.
Item 10 Condition 1	Normalmente el trabajador comprende al jefe durante las reuniones.
Item 10 Condition 2	Normalmente lo comprende el trabajador durante las reuniones.
Item 11 Condition 1	Por la tarde el tío despierta a la tía de la siesta
Item 11 Condition 2	Por la tarde la despierta el tío de la siesta.
Item 12 Condition 1	Por la mañana la prima despierta al primo con la amiga.
Item 12 Condition 2	Por la mañana lo despierta la prima con la amiga.
Item 13 Condition 1	Por la tarde la amiga besa al amigo para la graduación.
Item 13 Condition 2	Por la tarde lo besa la amiga para la graduación.
Item 14 Condition 1	De repente la novia besa al novio en la boca.

Item 14 Condition 2	De repente lo besa la novia en la boca.
Item 15 Condition 1	En este instante la cantante mira a la periodista durante la entrevista.
Item 15 Condition 2	En este instante la mira la cantante durante la entrevista.
Item 16 Condition 1	Hoy el hermano mira a la hermana en el comedor.
Item 16 Condition 2	Hoy la mira el hermano en el comedor.

APPENDIX B. *Auditory Sentence Processing Task Pictures.*

POL01a POL01b POL01c POL01d




OL01a OL01b OL01c OL01d




OL02a OL02b OL02c OL02d




OL03a OL03b OL03c OL03d



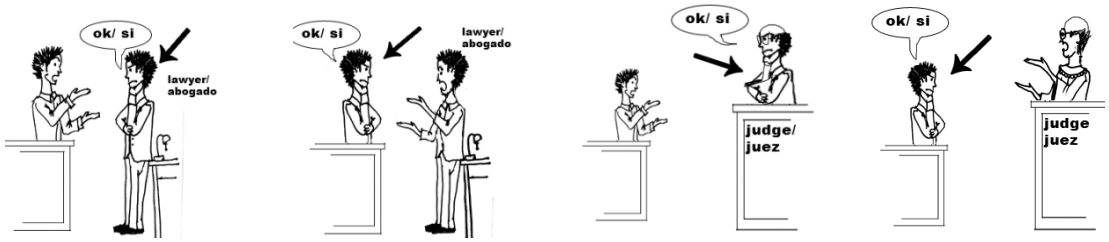

OL04a OL04b OL04c OL04d



OL05a OL05b OL05c OL05d

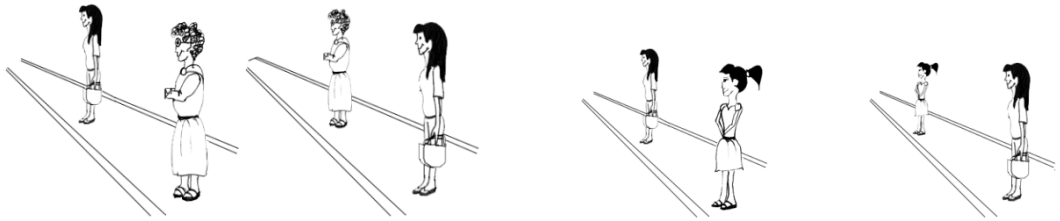
OL06a OL06b OL06c OL06d

OL07a OL07b OL07c OL07d



OL08a OL08b OL08c OL08d

OL09a OL09b OL09c OL09d



OL10a OL10b OL10c OL10d

OL11a OL11b OL11c OL11d

OL12a OL12b OL12c OL12d

OL13a OL13b OL13c OL13d

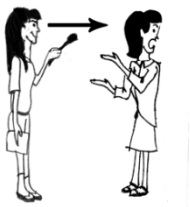
OL14a OL14b OL14c OL14d

OL15a OL15b OL15c OL15d


OL16a


OL16b


OL16c


OL16d