The Interaction Between Word Order and Verb Type in L2 Spanish and L1 English Sentence Processing

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Russell Simonsen

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Advisor: Mandy Menke

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Abstract

This study of second-language (L2) sentence processing responds to the following two questions: (1) Can L2 learners become nativelike processors?; and (2) Is L2 processing influenced by first-language (L1) processing or knowledge? These questions were addressed by examining L2 Spanish speakers' and L1 English speakers' sensitivity to the interaction between word order and verb type in self-paced reading (SPR) tasks.

The results of two Spanish SPR tasks revealed that beginner and intermediate L2 learners' sentence processing and accurate interpretation of sentences were influenced primarily by changes in word order, which is non-nativelike behavior. The processing of advanced L2 learners and native Spanish speakers, however, was affected by the interaction between word order and verb type. Word order as an isolated variable seems to affect sentence processing less as Spanish proficiency increases. An English sentence completion task and an English SPR task demonstrated that there is an interaction between word order and verb type that resembles the one in Spanish.

Overall, the results suggest that L2 Spanish learners can perform similar to native speakers when processing sentences with variable word order and verb type. Also, because there is more crosslinguistic similarity between English and Spanish at the intersection of word order and verb type than previously thought, claims that L1 English is a source of negative language transfer or that L1 English knowledge cannot aide in the L2 acquisition of Spanish should be made with more hesitation.

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Chapter 1: Introduction

Language processing during comprehension is concerned with the unconscious moment-by-moment, real-time computation of sentence structure as well as the mapping of meaning onto form. For example, a reader or listener of the following sentence, "Bill's not going to retire anytime soon" begins computing sentence structure and attempting to interpret meaning upon hearing or reading the very first word. In this case, the person must initially determine whether "Bill's" is a subject with a contracted auxiliary or copular verb (e.g., "Bill has…" or "Bill is…") or whether it is an noun with a possessive marker that functions as an adjectival (e.g., "Bill's house…"). Continued processing of the sentence helps the reader/listener to go down one computational path as opposed to another (in this case, opt for "Bill's" being the subject + auxiliary given the next word is "not".). The study of first language (L1) processing has yielded interesting results about the nature of sentence computation and factors that affect it (For an overview, see, for example, Carreiras and Clifton 2004).

Second language (L2) sentence processing has gained increased attention over the last twenty years (e.g., Clahsen and Felser 2006; Dussias, 2010; Jegerski and VanPatten 2014; Juffs 1998; Juffs and Rodriguez 2014; VanPatten and Jegerski 2010). Two major issues have surfaced in this domain of research. The first is to what extent L2 learners engage in nativelike processing during real-time comprehension. The second is to what extent there is L1 influence during L2 processing. This dissertation will explore these questions by looking at how L2 learners process sentences in which the following variables are manipulated: (1) word order; and (2) type of verb.

The present chapter is structured as follows. First, I will review some of the basic literature in L2 processing to motivate the questions of nativelikeness and L1 influence. Next, I will motivate the two types of verbs used in the studies in this dissertation (action and psych verbs) and their relationship to word order. In the following section, I will review the self-paced reading method and explain how it will be utilized to answer the questions related to L1 and L2 processing in the present work. The final section will outline the rest of the dissertation.

1. Can L2 Learners Become Nativelike Processors?

The field of sentence processing is concerned with the comprehension and interpretation of sentences, dealing specifically with issues such as "syntactic and semantic processing, the time-course of interpretation, and the role of other cognitive systems such as working memory in forming sentence interpretations" (Ferreira and Çokal 2016: 265). In this dissertation, syntactic and semantic processing will be the focus, as the main variables under examination are word order (part of syntax) and verb type (part of semantics). In L2 research, it is important to study real-time sentence processing in addition to offline grammatical knowledge because there is not always a transparent link between the two. Clahsen and Felser (2017: 4) explain that "[l]earners who demonstrate nativelike grammatical knowledge are sometimes found to show non-nativelike processing patterns…This indicates that L2 speakers have difficulty putting their grammatical knowledge to use during real-time processing" (see Juffs 1998 also). Processing studies are thought to tap L2 learners' implicit linguistic knowledge, which is the abstract automated knowledge about language that they may not be fully conscious of. This contrasts with explicit linguistic knowledge that L2 learners are conscious of and

can characterize in their own words (Hulstijn 2005).

In L2 research, the question as to whether L2 learners can become nativelike processors has emerged as a major issue (Clahsen and Felser 2006; VanPatten 2014). As detailed in their *Shallow Structure Hypothesis*, Clahsen and Felser (2006) propose that L2 learners compute syntactic structures incompletely and are unlikely to attain a nativelike ability: "contrary to native speakers, adult learners are largely *restricted* to [shallow processing] in L2 processing, computing representations for language comprehension that lack syntactic detail, and attempting to form direct form-function mappings instead" (34). The implication is that L2 learners' processing of syntax will be different from native speakers', regardless of language proficiency.

One of the studies that informed the *Shallow Structure Hypothesis* was Papadopoulou and Clahsen (2003), a self-paced reading study that examined the processing of relative clauses in L2 Greek. In many languages, sentences can contain an ambiguous relative clause (italicized), as in (1).

(1) A man called the student of the teacher *who was disappointed*.

In this example, it is not immediately clear who is disappointed—the student or the teacher. Native Greek speakers, however, have a general preference for high attachment, which means that they tend to interpret (1) with the reading in which the student is disappointed. While this preference was observed in the expected condition among L1 Greek speakers, the L2 Greek learners did not have a preference for high relative clause attachment in the same contexts. To account for this difference, Papadopoulou and Clahsen (2003) suggested that L1 Greek speakers disambiguated sentences based on underlying syntactic properties, which led to a clear preference for high attachment. In

contrast, they speculated that L2 learners did not compute full syntactic representations of the sentences, and instead relied on lexical-semantic cues to disambiguate sentences (Papadopoulou and Clahsen 2003); this resulted in a lack of attachment preference in the relevant context. This non-nativelike result could not be easily attributable to insufficient L2 proficiency, because all learners had advanced proficiency in Greek as determined by a university proficiency test, and at the time of the experiment they had lived in Greece between 4 and 11 years. Clahsen and Felser (2006) concluded that unlike native processing, L2 processing is predominated by shallow processing, even at high levels of proficiency.[1]

As a challenge to the *Shallow Structure Hypothesis*, Jegerski (2010) documented near-native L2 Spanish learners' ability to perform in a nativelike way in several morphosyntactic contexts, which suggests that non-native speakers are not restricted to shallow processing. For example, she discovered that both native and near-native Spanish speakers are sensitive to subject-verb number agreement violations (e.g., **La llave son…* 'The key are…'). In fact, the near-natives showed a more immediate effect to violations. Also, in sentences that contained post-verbal nouns that could be ambiguously interpreted as a subject or object (i.e., in "garden-path sentences"), both near-natives and natives were able to rely on abstract syntactic representations (i.e., they could posit null subjects) in order to avoid ambiguity effects ("garden-path effects") in Spanish. Jegerski (2010)

[1] It is important to point out that Clahsen and Felser (2006) do not claim that shallow processing is unique to L2 learners. In fact, the term shallow processing was borrowed from L1 psycholinguistic work in which researchers argued that native speakers do not always compute full syntactic representations, and instead use a "good enough" heuristic to interpret ambiguous sentences (Ferreira 2003; Ferreira et al. 2009). According to Clahsen and Felser (2006), shallow processing occurs in an L1, but it *predominates* in an L2, which can result in non-nativelike behavior.

interpreted these results to mean that L2 learners are capable of computing detailed syntactic representations in real time, like native speakers.

Hopp (2010) and Street (2017) have also found that L2 learners are capable of achieving nativelike processing of morphosyntax, and both reject the idea that L1 processing and L2 processing are fundamentally different (Clahsen and Felser 2006). Hopp (2010) argues that L1 and L2 speakers build sentences with the same morphosyntactic detail, but factors such as L1 influence and inefficiency are responsible for differences in L1 and L2 processing. Street (2017) questions the very concept of "nativelike" processing, based on evidence that (1) native speakers show significant variation in their processing patterns, and (2) L2 learners with high educational attainment can outperform native speakers with lower educational attainment. These findings challenge the foundational premise of the *Shallow Structure Hypothesis* (Clahsen and Felser 2006), namely that L1 processing is quantitatively different if not qualitatively different from L2 processing.

Based on the evidence presented above and the lack of consensus in the field regarding the similarities/differences between L1 and L2 processing and the ability of L2 learners to process like native speakers, it is clear that further research is warranted. One of the factors that has slowed progress in reaching a consensus on these questions is the fact that historically, very few L2 processing studies have included learners from the high end of the L2 proficiency spectrum (Keating 2017). Jegerski (2010) and Papadopoulou and Clahsen (2003), which included highly advanced L2 learners, are among the exceptions. Consequently, the full developmental trajectory of L2 sentence processing is inadequately understood, and prominent processing theories such as the *Shallow*

Structure Hypothesis (Clahsen and Felser 2006) are based overwhelmingly on data from non-advanced L2 learners or mixed groups that contain both intermediate and advanced learners (Keating 2017). This dissertation will include a cross-sectional design that examines L2 processing at three different levels: beginner, intermediate, advanced. Such a design will strengthen our understanding of the trajectory of L2 processing and contribute additional data towards the goal of answering the question of if and when L2 processing can become nativelike.

2. Is L2 Processing Influenced by L1 Processing or Knowledge?

Another major issue in L2 sentence processing studies concerns the degree to which L2 processing is influenced by L1 knowledge or processing strategies. L1 influence is also commonly referred to as *L1 transfer* and it can be *positive* or *negative*; these two latter terms respectively describe whether the transfer aides or interferes with target-like behavior in the L2. Within regard to the effect of L1 transfer in L2 processing, there are two main possibilities: (1) L1 processing strategies are transferred to the L2, or (2) L2 processing is influenced more by universal forces, regardless of the L1. The first possibility is captured in the following statement: "L2 learners initially use L1 strategies to process L2 sentences, but…they adopt L2-appropriate comprehension strategies with increased L2 exposure" (Morett and MacWhinney 2013: 149). The second possibility is partially assumed in the *Shallow Structure Hypothesis*. Clahsen and Felser (2006b) conclude that L1 influence can affect L2 processing in the domains of phonology, orthography, lexicon, but less so in syntax, especially in complex syntactic structures with non-local dependencies (e.g., filler-gap dependencies). A brief discussion of evidence for each possibility (L1 transfer or no L1 transfer in L2 processing) as well as

how to test for transfer is provided below.

One of the three necessary considerations in the assessment of L1 transfer is *crosslinguistic performance congruity*: "Evidence that a language user's behavior in one language really is motivated by her use (i.e., the way she demonstrates her knowledge) of another language" (Jarvis and Pavlenko 2008: 35). In other words, if a specific behavior surfaces in participants' L2, it can only be considered a result of L1 transfer if similar behavior is observed in their L1. L2 studies that include participants with several different L1s offer the most convincing evidence regarding language transfer because they allow for different results to emerge based on the degree of congruity between the L1s and the L2. One such study is Hopp (2010), which included advanced and near-native L2 learners of German that were separated into three different groups based on their L1s: Russian, Dutch, and English. German has a relatively free word order, and native speakers rely on case marking on articles to disambiguate who is doing what to whom in sentences. For example, in (2a-b), the article *der* 'the' has nominative case and indicates who is doing the beating action, and *den* 'the' has accusative case and indicates who is receiving the action. The two sentences have a different word order, but the meaning is the same because the case marking on the articles clarifies who the agent of the action is.

(2) a. Ich glaube, dass **der** Vater **den** Onkel geschlagen hat.
I think that the.NOM father the.ACC uncle beaten has
b. Ich glaube, dass **den** Onkel **der** Vater geschlagen hat.
I think that the.ACC uncle the.NOM father beaten has
'I think that the father beat the uncle.'

(Hopp 2010: 907)

The nature of the different L1s in the study was key for an assessment of crosslinguistic performance congruity: Russian marks full noun phrases (e.g, *Onkel* 'uncle') with case morphology, like German, but Dutch and English do not. For example, neither Dutch nor English have contrastive definite articles akin to the German *den* and *der* that indicate the case of the noun they are modifying (see (2)). Therefore, if L1 Russian speakers turned out to be more responsive to case-marking violations in L2 German when compared with L1 Dutch or L1 English speakers, then language transfer could be responsible for this difference. This is precisely what Hopp (2010) found. In a speeded grammaticality judgment task, which increased processing demands, L1 Russian speakers performed with nativelike accuracy when identifying case violations, but the L1 Dutch and L1 English speakers did not. Hopp (2010) concluded that at least with regard to case marking, crosslinguistic similarity between the different L1s and German was the factor that determined whether nativelike processing was possible in L2 German.

To provide another example of an L2 study that addressed L1 transfer, I will return to Papadopoulou and Clahsen (2003). The reader will recall that this self-paced reading study examined the processing of sentences with ambiguous relative clauses (see

(1)) in L2 Greek. The participants were divided into three different groups based on their L1s: Spanish, German, and Russian. In contrast to the design in Hopp (2010), all three L1s in Papadopoulou and Clahsen (2003) were similar to the L2 (Greek) in that high attachment of relative clauses was preferred across the board. This means that speakers of all languages involved would generally prefer the interpretation of the sentence in (1) in which the student is disappointed. It was hypothesized that all groups of L2 Greek learners would prefer a high-attachment strategy in Greek based on the congruity with their L1s. Nevertheless, unlike the L1 Greek speakers, none of the L2 learners employed a high-attachment disambiguation strategy. Papadopoulou and Clahsen (2003) concluded that there was no direct transfer between the L1s and the L2 with regard to attachment preferences.

The two studies described above offer opposite evidence regarding the broad issue of L1 influence, and are a reflection of the two general findings that are possible in this debate. It could be the case, however, that L1 transfer is not observed in the same way in all phenomena. For example, it is conceivable it is more observable with case marking as opposed to the resolution of relative clause ambiguities. The only way to strengthen our understanding of L1 transfer is to continue to probe for it in different language combinations and in different linguistic contexts. As Sprouse (2018) notes, when dealing with broad theoretical questions, converging evidence often emerges slowly and requires research that spans "dozens or hundreds of phenomena" (213). This dissertation will be the first to empirically compare how word order and verb type affect online processing in L1 English and L2 Spanish. This will allow for a preliminary assessment of crosslinguistic performance congruity (Jarvis and Pavlenko 2008) in the

two languages, which will pave the way for more robust analyses of language transfer in the future.

3. Word Order and Verb Type

3.1 Word Order

Word order has been a major focus in L2 Spanish studies that have examined L1 transfer and the development of L2 processing since VanPatten's foundational research in L2 Spanish (VanPatten 1984) in which he studied learners' accuracy in interpreting subject-verb-object (SVO) and object-verb-subject (OVS) sentences. He found that in object-initial Spanish sentences (see (3)), non-advanced L2 Spanish learners had difficulty identifying who was doing what to whom (i.e., who is inviting whom?). They more often interpreted the object *lo* 'him' to be the subject and assumed that *María* was being invited to the movies.

(3) Lo invita al cine María.
Him-ACC invites to the movie theater María-NOM
'María invites him to the movies.'
*'He invites María to the movies.'

VanPatten (1996) suggests that L2 Spanish learners' non-targetlike interpretations of object-initial sentences like (3) could be due to a universal parsing strategy known as the First Noun Principle: as a default, L2 learners interpret the first noun in a sentence to be the subject.

The effect of word order in L2 Spanish processing has also been studied from a developmental perspective. Like VanPatten (1984), Malovrh and Lee (2013) conducted a subject identification experiment in order to determine how accurately L2 Spanish

learners could interpret sentences with different word orders, but they included a wider spectrum of learner proficiencies. They discovered that undergraduate L2 Spanish learners peaked at 60.6% accuracy when identifying the grammatical subject in object-initial sentences like (3), but postgraduate L2 Spanish learners achieved 86.3% accuracy. While there was obvious improvement as a result of higher proficiency, the authors did not include a control group of native speakers in the study, so the question as to whether the higher accuracy in the postgraduate group was nativelike was left unresolved.

Although word order is an important variable to consider in L2 processing, it has commonly been examined in isolation from another variable that it may interact with: verb type. In the following subsections, I will discuss the relationship between word order and verb type in Spanish and English, which will motivate the need to study both variables together.

3.2 The Relationship between Word order and Verb Type in Spanish

There is a close relationship between word order and verb type in Spanish. Certain word orders do not force the use of a certain verb types or vice versa; instead there are *canonical* and *non-canonical* relationships between the two. A *canonical* pattern is one that speakers tend to use in contexts that are "discourse-neutral, intonationally unmarked, basic" (Namboordiripad 2017: 6). In Spanish, verbs that describe a psychological experience ("psych verbs"), like *gustar* 'to like' and *encantar* 'to love', take a dative object experiencer (*me* 'to me') and are the only class of verbs that are canonically used in object-verb-subject (OVS) order (Gutiérrez-Bravo 2007). See example (4).

(4) A María le gusta Juan. (OVS/psych)

To-DAT María him-CL.DAT appeals Juan-NOM

'María likes Juan.'

Other verbs describe actions, such as *gritar* 'yell' and *escribir* 'write', and they will be referred to as "action verbs."[2] These verbs can also take dative objects (*me* 'to me'), but they are most commonly used with a subject-verb-object (SVO) word order (Gattei et al. 2015), as seen in (5).

(5) María le grita a Juan. (SVO/action)

María-NOM him-CL.DAT yell-3sg. to Juan-DAT

'María yells at Juan.'

It is possible to break from the patterns in (4) and (5); OVS word order can be used with action verbs, and SVO word order can be used with psych verbs. While such patterns are grammatical, they are non-canonical (Gutiérrez Bravo 2007), and therefore generally reserved for contexts with specific discursive and pragmatic motivations. Canonical word order/verb type associations in Spanish are often relevant very early on in L2 acquisition because psych verbs such as *gustar* 'to like; lit: to appeal', and *encantar* 'to love; lit: to enchant' tend to be among the first ones taught to L2 learners (Whitley 1995).

Although L2 and heritage learner acquisition at the intersection of word order and verb type in Spanish has been studied, researchers have focused primarily on issues related to grammaticality (e.g., Gómez Soler 2014; Toribio and Nye 2006; Kanwit and Lubbers Quesada 2017). For example, Quesada (2008) reported that L2 Spanish learners

[2] These are also known as "active verbs."

(L1 English) tend to confuse preverbal dative object experiencers with subjects. In (4), this would involve erroneously interpreting *María* to be the subject instead of the dative object. This confusion might be exacerbated by the fact that psych verbs with similar semantic content sometimes belong to different verb classes in English and Spanish. While *gustar* is an intransitive verb in Spanish, the semantic equivalent in English, *like*, is transitive.

It is true that analyzing learner "errors" can help us understand the process of acquisition, but it is also important to explore issues other than grammaticality. There are many combinations of variables that result in linguistic variation within the realm of grammaticality, and measuring the sensitivity to this variation is another way of assessing nativelike abilities. For this reason, one of the studies in this thesis will examine whether L2 Spanish learners distinguish canonical and non-canonical word order/verb type patterns in a nativelike way at different proficiency levels, as determined by a real-time reading task.

3.3 The Relationship between Word Order and Verb Type in English

In L2 Spanish studies, English is most commonly described as a strict SVO language that does not have a strong relationship between word order and verb type (Gómez Soler 2015; Pascual y Cabo 2013; Tight 2012). As a result, crosslinguistic performance congruity (Jarvis and Pavlenko 2008) at the intersection of these variables might not be expected in English and Spanish, and this difference could constitute a conflict site that results in negative language transfer when English speakers are

attempting to learn Spanish[3]. Nevertheless, the relationship between word order and verb type in English has not been studied experimentally in L2 Spanish studies, which is a shortcoming that I will address. While it is true that the canonical word order in English is SVO, the non-canonical order OSV is also possible (Namboodiripad 2017). Examples of this word order are commonly found when the object is marked with dative case and has the thematic role of experiencer (i.e., when it is a "dative object experiencer"). Dative object experiencers only appear with psych verbs, such as *sound*. An example of OSV word order with this verb is shown in the underlined portion of (6).

(6) Police officer Henry Huot, who captured Morales after the shooting, testified that Morales pointed his gun at the officer before "fumbling" it on the ground…Huot also said that to him Morales sounded "evil" and "demonic" the way he was laughing.

(*The Guardian*, 2016, "Mark Carson Murder")

The OSV word order is found in the fragment "to him Morales sounded" in the subordinate clause in (6). Officer Huot is the referent of the dative object experiencer *to him*. In other words, Officer Huot is the one who experienced Morales sounding evil and demonic. The dative object experiencer *to him* is followed immediately by the subject theme, *Morales*, the person who made the evil and demonic sounds. Next, the psych verb *sounded* appears, which completes the OSV order.

[3] Crosslinguistic similarity/dissimilarity does not *determine* whether L1 language transfer will occur, and it is only one of three necessary factors to consider in an assessment of language transfer, along with *intragroup homogeneity* and *intergroup homogeneity* (Jarvis and Pavlenko 2008). Other factors that are argued to be relevant to transfer include 1) how perceivable differences between the languages are and 2) whether or not the structures or features in the languages have a similar form-function relationship (Andersen 1984; Jarvis and Pavlenko 2008).

To illustrate that verb type is truly relevant to the use of OSV word order, compare examples (7) and (8). Sentence (7a) contains the psych verb *seem* and a dative object experiencer *to me*. Sentence (8a), however, contains the action verb *sends* and a dative object recipient *to me*. Now, notice that when the dative objects *to me* are fronted in both sentences, which is shown in (7b) and (8b), only (7b) remains natural:

(7) a. John seems like a nice person to me.

b. To me, John seems like a nice person.

(8) a. John sends lots of emails to me.

b. ?To me, John sends lots of emails.

This pattern in English can be linked to one that is observed in Spanish and summarized in the following way: within two predominantly SVO languages, English and Spanish, psych verbs are associated with the use of an object-initial word order. Because of this crosslinguistic similarity, examining word order alone in L2 studies that consider L1-L2 crosslinguistic influence between English and Spanish might lead to an incomplete analysis. It is relevant to identify the specific types of verbs and the thematic roles that are assigned to subjects and objects. For example, is an object a dative object *recipient* or a dative object *experiencer*? Is a subject an *agent* or a *theme*? This level of nuance will be included in the present work in pursuit of more thoroughly understanding the processing of word order and verb type in both L2 Spanish and L1 English, which will allow for a discussion of whether or not language transfer is likely in this domain.

4. Self-paced Reading as a Measure of Sentence Processing

The focus of the present dissertation is real-time language processing (i.e., the moment-by-moment computation of sentence structure and the mapping of meaning onto

form). There are various ways to examine processing, notably through the measurement of reading times, eye movements, or brain activation (e.g., electroencephalography (EEG)). Each has its advantages and disadvantages, depending on the research questions that confront a scholar. In this dissertation, I will use self-paced reading (SPR) as the measure of processing. With SPR, participants complete a computerized task in which words or segments are revealed one at a time, and the time spent reading each word or segment is recorded. The task is "self-paced" because participants determine how fast they proceed through the sentences by pressing a button. For example, let's take the sentence "The man chased the dog that bit him." It could be divided into the following segments:

(9) The man // chased // the dog // that // bit him

A participant would first see the sentence masked as a series of dashes, like this:

Next, the participant would press a button to reveal the first segment, and then continue to press the button to reveal new segments as the previous ones disappeared. Each line below represents a press of the button:

The man----------

----------chased----------

----------the dog----------

----------that----------

----------bit him.

The participant would then respond to a comprehension question about some aspect of the sentence that is not the focus of the experiment. This methodology has been used in psycholinguistic research since the 1970s and is assumed to reflect real-time mental processes that occur during reading (Jegerski 2014). SPR was later incorporated into L2 research in the 1990s (e.g., Juffs and Harrington 1995) and has become increasingly popular, along with other psycholinguistic methods (Jegerski and VanPatten 2014). The fundamental assumption underlying the SPR method is the following: When reading a sentence, we slow down "at points where processing loads are greater" (Just and Carpenter 1980: 329). This makes it possible to compare the processing load of specific factors in similar sentences. For example, I could create an additional sentence identical to (9), with the only difference being that "dog" is replaced with "snail." The relative time that participants spend reading the segment with the two different nouns would reflect the processing load that each noun induced in this context. Based on the well-established finding that plausibility affects reading times (e.g., Traxler 2005), we might expect "snail" to cause a reading delay in comparison to "dog" because it is less plausible for a man to chase a snail.

In online (i.e., real-time) reading studies, participants also tend to slow down when accessing low-frequency words or structures, integrating morphosyntactic information from different clauses, and encountering ambiguous or ungrammatical sentences (Just and Carpenter 1980; Jegerski 2014), to name a few causes. Most relevant for this dissertation, Gattei et al. (2015) showed that native Spanish speakers read sentences with canonical word order/verb type patterns faster than those with non-canonical patterns. Therefore, the SPR method will be appropriate for measuring L2

Spanish learners' sensitivity to the canonicity of word order/verb type patterns in Spanish in order to determine if and when these learners can become nativelike processors, and it can also be used to assess L1 English speakers' sensitivity to canonicity in English.

5. Overview of the Dissertation

The main objective of this dissertation is to examine the interaction between word order and verb type in L2 Spanish and L1 English sentence processing in order to assess the nativelikeness of L2 processing at various proficiency levels and consider how L1 transfer may be relevant to L2 processing. The cross-sectional experimental design of this dissertation will advance our understanding of the development of L2 Spanish processing, which is not currently well understood (Jegerski and VanPatten 2013; Clahsen and Felser 2017). The crosslinguistic experimental design also answers a recent call from Hitz and Francis (2016), who encourage the empirical analysis of participants' L1 in L2 studies: "SLA researchers interested in researching language transfer need to base their L1-related hypotheses on experimental data" (1271).

5.1 Overview by Chapter

In chapter 2, I report the findings from a Spanish SPR task completed by a cross-sectional group of L2 Spanish learners and a group of native Spanish speakers. The SPR task recorded reading times in sentences that varied in word order and verb type. Following Gattei et al. (2015), two of the order/verb type combinations were canonical (SVO/action verb, OVS/psych verb), and two were non-canonical (SVO/psych verb, OVS/action verb). The L2 learners were comprised of two groups of university-level learners (fourth-semester Spanish students and Spanish majors/minors), and one group of L2 learners who had completed a MA or PhD in Spanish studies. The objective was to

document L2 learners' sensitivity to the disparate canonicity of word order/verb type patterns and the development of this sensitivity with proficiency.

Chapter 3 consists of two tasks. The first is a sentence completion task that documented native English speakers' preferences with regard to different word order/verb type combinations. The second task is an English SPR task that was designed to mimic the Spanish SPR task from chapter 2. English speakers read sentences with different word order (SVO vs. OSV) and verb type (action vs. psych) combinations, and the reading times for each word were recorded. The processing results from this task will be compared with the offline sentence completion results (Task 1) and with the Spanish SPR results from Chapter 2. The comparison of English and Spanish SPR data will constitute a preliminary assessment of crosslinguistic performance congruity (Jarvis and Pavlenko 2008), which I will use to speculate about the potential crosslinguistic influence that L1 English could have on L2 Spanish acquisition at the intersection of word order and verb type.

Chapter 4 also contains two tasks. The first is a SPR subject identification task, and it was completed by the same participants from Chapter 2. The objective was to determine whether different word order/verb type combinations affected the correct interpretation of subject and object arguments. Task 2 is a crosslinguistic within-subject subject identification task that was completed by a separate group of L2 Spanish learners (L1 English). Half the task was in English, and half in Spanish. The goal was to explore participants' crosslinguistic performance congruity with regard to subject identification, which will allow me to hypothesize about whether L2 learners' ability to determine *who did what to whom* in L2 Spanish might be hindered by their L1 English processing

strategies.

Chapter 5 summarizes the findings from Chapters 2-4 and outlines their significance in L2 research, relating the results back to the major questions that underlie L2 processing research—namely, whether or not learners can become nativelike in processing and to what extent the L1 influences L2 processing.

Chapter 2: The Interaction between Word Order and Verb Type in L2 Spanish

1. Background

The goal of this chapter is to understand how word order (SVO vs. OVS) and verb type (action vs. psych) variations affect the L2 Spanish processing of grammatical sentences at various proficiencies, and how this L2 processing compares with that of native Spanish speakers. There are no existing L2 processing studies that have examined the intersection of these variables in grammatical sentences, however, so the majority of the motivation for this study is based on L1 research. In fact, the experimental design of the current study is based on a modified version of the one from the self-paced reading (SPR) study in Gattei et al. (2015), which examined the interaction between word order and verb type in L1 Spanish. In this section, I will outline relevant L1 research and extrapolate from the limited relevant L2 research to motivate the present study.

Linguists have long studied the connection between arguments' semantic/thematic roles and the syntactic positions that they occupy (e.g., Fillmore 1968). For example, in essentially every language, the thematic role of Agent is mapped to subject position in active sentences; these sentences become ungrammatical if the Agent appears in a different syntactic position:

(1) John wrote the letter.

#The letter wrote John.

#The letter wrote to John.

(Belletti and Rizzi 1988: 292)

Psych verbs do not follow this generalization, however, making them somewhat of a linguistic anomaly in virtually all theoretical frameworks. These verbs have been traditionally described as projecting two arguments, which correspond to the thematic roles of Experiencer and Causer/Theme. The Experiencer represents the argument that undergoes a "sensory, cognitive, or emotional experience" (Santorini and Kroch 2007), and the Causer/Theme is the argument that serves as the stimulus for the Experience. In fact, the Theme is sometimes referred to as the "stimulus". These thematic roles are not always found in the same syntactic position, as Belletti and Rizzi's (1988) tripartite classification of psych verbs shows (as applied to Spanish):

(2) **a**. Class I: Subject experiencer, accusative theme (Experiencer-V-Theme)

María odia a Juan.

María hate.3SG DOM[4] Juan-ACC

'María hates Juan.'

b. Class II: Nominative theme, accusative experiencer (Theme-V-Object Experiencer)

María preocupa a Juan.

María worry.3SG DOM Juan-ACC.

'María worries Juan.'

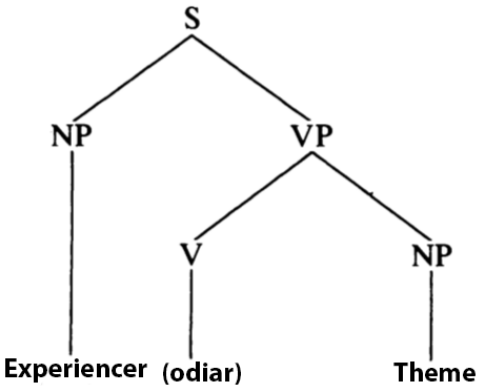
[4] DOM = Direct object marker

c. Class III: Nominative theme, dative experiencer (Experiencer-Verb-Theme or Theme-Verb-Experiencer)

A María le gusta Juan or Juan le gusta a María.
To María dat.cl. appeals Juan Juan dat.cl. appeals to María.
'María likes Juan.'

The fact that Themes and Experiencers appear as both subjects and objects depending on the class of psych verb posed a problem for universal thematic hierarchies, such as the Uniformity of Theta-Assignment Hypothesis (UTAH; Baker 1988). This hypothesis was created based on the idea from Government and Binding theory (Chomsky 1982) that there was a deep structure and surface structure syntax, and that the structural relationship between thematic roles should be identical in both. This meant that although Themes and Experiencers surface in different syntactic positions, as in (2a-c), at deep structure, the two roles maintained the same relative structural relationship with one another. Through a syntactic analysis of psych verbs rooted in Government and Binding theory, Belletti and Rizzi (1988) developed a deep structure model of the three classes of psych verbs that ultimately supported Baker's (1988) UTAH. The three deep structure syntactic representations in (3a-c) correspond to sentences (2a-c), based on Belletti and Rizzi's (1988) work:

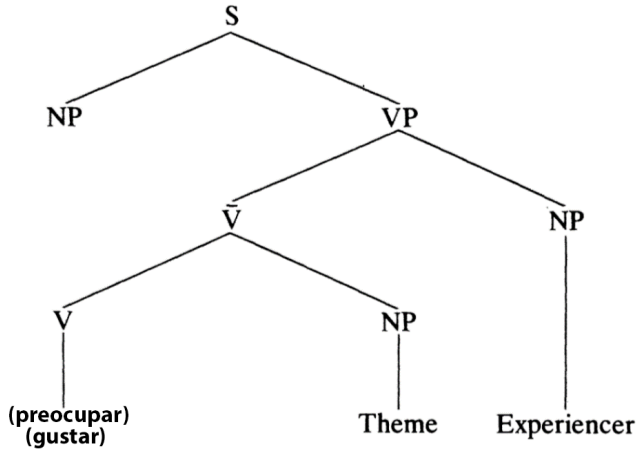
(3) a. Class I verbs



María odia a Juan

'María hates Juan.'

b. Class II and III verbs



A María le gusta Juan or Juan le gusta a María

'María likes Juan.'

Based on the syntactic representations above, Belletti and Rizzi (1988) state the following: "Given a θ-grid [Experiencer, Theme], the Experiencer is projected to a higher position than the Theme" (344). They assume that this structural prominence of Experiencers is a result of thematic prominence: "[mapping] principles guide the shaping

of syntactic structures on the basis of the substantive thematic information in lexical entries…they can be seen as encoding intrinsic thematic prominence into configurational prominence" (344). Therefore, Belletti and Rizzi (1988) assume that semantics, or the "thematic prominence" of arguments, is what is responsible for abstract syntactic relationships. The authors characterize the relative prominence of thematic roles with the following hierarchy:

(4) Agent > Experiencer … > Theme

Belletti and Rizzi (1988: 344) state that for any pair of roles, the higher role according to (4) should be "projected to a higher structural position." This is what is known as a relative or context-dependent thematic hierarchy (Levin and Rappaport Hovav 2005). When Belletti and Rizzi (1988) refer to structural or "configurational prominence," they are not referring to the structure of sentences as we speak them necessarily, but rather to abstract structural configuration. However, abstract and attested "surface" configurations often overlap. For example, "structurally high" syntactic positions usually correspond with positions in a sentence closer to the left-edge in languages such as Spanish and English. In this study, I will use a slightly modified version of Belletti and Rizzi's thematic hierarchy, and will reapply it based on the assumption that thematic prominence between two arguments is also ideally preserved syntactically based on grammatical relations and their "surface" position in a sentence in Spanish (Givón 1984). Essentially, Belletti and Rizzi's hierarchy will be reinterpreted from a functionalist perspective.

From a functionalist perspective, the syntactic position most associated with subjects is generally more prominent than the syntactic position for objects because subjects are more important to highlight for discourse continuity (Givón 1984); in other

words, the prominence of the syntactic position of an argument is partly motivated by its topicality in discourse. Additionally, based on the idea that syntactic and semantic prominence should ideally align (e.g., Belletti and Rizzi 1988), subjects generally have more prominent thematic roles than objects. It is possible for an object to be more topical than the subject if the object appears in a syntactically prominent position through topicalization (i.e., at the beginning of a sentence: "**To me**, John seems nice"). In this case, because the object is in a highly prominent syntactic position, it should ideally have the highest thematic role that is compatible with it in order to align thematic and syntactic prominence. I argue that these canonical syntactic/semantic alignments of prominence are what speakers use to make predictions about upcoming linguistic information during processing. Before elaborating on this idea, I will describe a different approach to characterizing the prominence of arguments and how it relates to predictions in real time processing (Gattei et al. 2015). Then, I will return to explain why the reconceptualized hierarchy from Belletti and Rizzi (1988) can capture the same generalization with fewer entailments.

1.1 Thematic Prominence and Word Order in Spanish Sentence Processing

While the syntactic and semantic nature of psych verbs has been analyzed in detail in Romance languages, most research has been theoretical (Belletti and Rizzi 1988) as opposed to experimental. Gattei et al. (2015, 2015b, 2017) have begun to change this trend. They incorporated Role and Reference Grammar theory (Van Valin and LaPolla 1997) into several sentence processing studies with the goal of analyzing the interplay between word order and verb class in Spanish. Based on previous work that revealed a significant connection between word order and verb class in German sentence processing

(Bornkessel and Schlewesky 2006), Gattei and colleagues wanted to determine whether this relationship was active in Spanish processing as well. In Spanish, it is generally accepted that the unmarked/canonical word order for action verbs (e.g., *escribir*, *gritar*) in declarative sentences is subject-verb-object (SVO), while the canonical word order for Class III psych predicates (e.g., *gustar*, *encantar*) with dative object experiencers is object-verb-subject (OVS) (e.g., Gattei et al. 2015; Gutiérrez-Bravo 2007). These word order/verb class pairings are summarized in Table 2.1:

Table 2.1. Canonical and non-canonical word order/verb type associations in Spanish

Verb Type	**Canonical order**	**Non-canonical Order**
Action verbs	SVO: *El chico le **grita** a la chica.*	OVS: *A la chica le **grita** el chico.*
Psych verbs	OVS: *A la chica le **gusta** el chico.*	SVO: *El chico le **gusta** a la chica.*

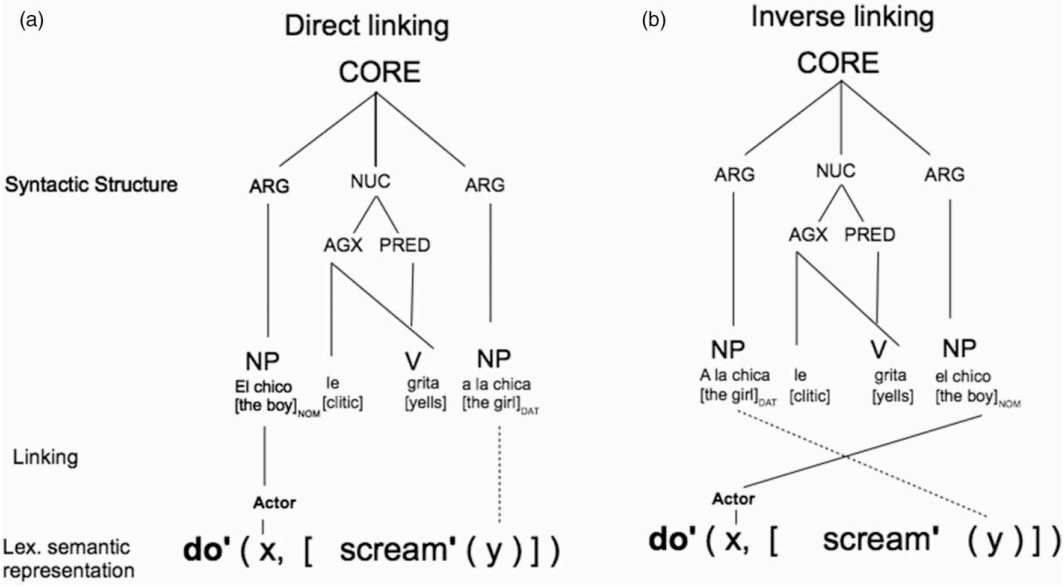
Gattei et al. (2015) accounted for the canonical patterns in Table 2.1 through an application of VanValin and LaPolla's (1997) theory that assigns arguments one of two generalized thematic roles known as "macroroles": Actor or Undergoer. Generally, the Actor is the more agent-like argument that is doing or causing an action, while Undergoer is the more patient-like argument that is affected by the action (VanValin and LaPolla 1997). These macroroles are assigned according to the specific predicate decompositions of verbs. For example, action verbs have one macrorole, an Actor, and Class III psych verbs have one macrorole, an Undergoer. According to Van Valin and LaPolla's theory, only direct arguments of a verb can be macrorole, which excludes the arguments in prepositional phrases (PPs) in Table 2.1. The semantic *logical structure* (or predicate decompositions) of *gritar* and *gustar* are shown below:

(5) do’ (x) [gritar’ (x, y)] X= Actor; Y= non-macrorole argument

(6) gustar’ (x, y) X= non-macrorole argument; Y=Undergoer

The assignment of macroroles to predicate decompositions is essentially a way of representing the prominence of arguments and their semantic function. However, Gattei et al. (2015) also made a direct association between the left-to-right arrangement of the semantic logical structures in (5) and (6) and left-to-right syntactic mapping. Since the semantic representation of arguments is organized as (x, y) in (5), the authors assumed that direct linking to the syntax would involve the X argument preceding the Y argument. Consequently, since X is the Actor and subject, direct linking would imply SVO word order. An inverse linking of (5) to syntax would be OVS word order, where Y linearly precedes X. These semantic/syntax linkings are shown in (7).

(7)

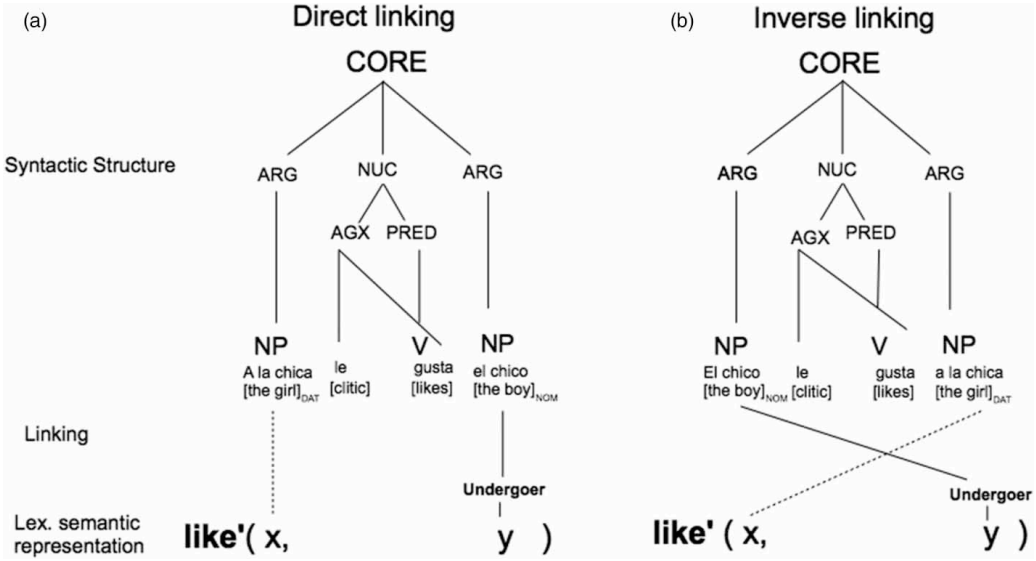


(Gattei et al. 2015: 1984)

Gattei et al. concluded that these differences in linking from semantics to syntax explain why SVO order is unmarked and OVS order is marked with action verbs; the linking in

(7b) from semantics to syntax is not ideal because it involves a cross-over linking, which makes the semantics-to-syntax linking non-transparent. While all of the linking rules in Role and Reference Grammar (Van Valin and LaPolla 1997) cannot be addressed here, the semantic representation of Class III psych verbs is essentially the reverse of action verbs; in the logical structure, the argument that will become the grammatical object (i.e., X) linearly precedes the argument that will become the subject (i.e., Y) (see (8a)). As was the case with action verbs, Gattei et al. (2015) assumed that the linear semantic representation is relevant to syntactic representation, and they accordingly establish direct and inverse linking patterns with Class III psych verbs:

(8)



Gattei et al. (2015: 1985)

With class III psych verbs, the OVS word order now represents an ideal direct linking, and SVO represents inverse linking with a crossover from semantics to syntax. Gattei et al. (2015) conclude that this is the motivation for OVS being the canonical word order with this class of psych verbs.

Based on these theoretical underpinnings, Gattei et al. (2015) set out to determine if Spanish speakers distinguished direct and inverse semantics-syntax linkings in online Spanish sentence processing. To this end, Gattei et al. recruited 79 native speakers of Argentinian Spanish to complete a SPR task; the four target conditions representing canonical (direct linking) and non-canonical (inverse linking) patterns are shown in Table 2.1. The SPR results led the authors to conclude that the Spanish speakers actively predicted what type of verb would appear after processing only the first argument and the verb, and these predictions were based on the expectation of a direct linking between semantics and syntax. If the first argument was interpreted to be an Undergoer (i.e., object), participants expected a Class III psych verb. Conversely, if the first argument was interpreted to be an Actor (i.e., subject) they expected an action verb. When these predictions were incorrect, participants processed sentences more slowly immediately after the verbal region. The authors ultimately concluded that "comprehension and processing speed is enhanced when sentence constituent order mirrors the argument order established by the lexical semantic structure of the verb" (Gattei et al. 2015: 2004). In other words, the conditions SVO/Action and OVS/Psych (canonical patterns) were comparatively easier to process than SVO/Psych and OVS/Action (non-canonical patterns) because the prominence between arguments was aligned in the semantics and syntax.

When speculating about the timing of syntactic and semantic computations, Gattei et al. (2015) relied on Bornkessel and Schlewesky's (2006) Extended Argument Dependency Model (eADM). According to this multi-phase sentence-processing model of core relations (i.e., a verb and its subject and object arguments), comprehenders

incrementally compute syntactic structure and thematic prominence and make predictions about upcoming linguistic information. In phase 1, a syntactic template is activated, but this template does not contain thematic information. In phase two, the thematic prominence of arguments is computed based on available linguistic information (e.g., case, word order, animacy). In phase 3, information from other domains, such as discourse (including pragmatic and situation-specific information), is added to the argument interpretation. The processing delay that participants experienced in non-canonical sentences in Gattei et al. (2015) theoretically happened during phase 2 of sentence processing; when they saw a verb type that did not provide the type of thematic roles that they had predicted, they experienced thematic reanalysis effects.

1.2 Alternative explanation of processing effects in Gattei et al. (2015)

I interpret the significance of sentence processing patterns differently from Gattei et al. (2015). It is important to describe these theoretical differences at this point since the current study is a modified L2 version of Gattei et al. (2015). Their conclusions were based on the Extended Argument Dependency Model (eADM), which is a sentence processing model developed by Bornkessel and Schelewesky (2006). The eADM, in turn, was formed based on concepts from the syntactic framework Role and Reference Grammar (VanValin and LaPolla 1997). However, it seems that Bornkessel and Schlesewsky and Gattei et al. (2015) incorrectly apply RRG theory when they link the semantic logical structure of predicate decompositions directly with the linear manifestation of syntactic arguments. To elaborate, they examine the linear order of the generalized semantic roles Actor and Undergoer in the logical structure of predicates and then assume that a sentence will be processed most easily if its arguments appear in this

same linear order in the syntax. This is known as a "literalist" approach to derivation (Phillips and Lewis 2013), which assumes that steps between two representations correspond to real-time mental operations. Nevertheless, VanValin and LaPolla (1997: 317-318) explain that

> [T]he relationship between the semantic representation and the syntactic representation is *not* derivational…Rather, the two independent representations are linked to each other, in the sense that argument variables in the semantic representation are associated with referring expressions in the syntactic representation, and vice versa. Accordingly, the relationship between the two representations is not the same as or analogous to the relationship between…D-structure, S-structure and logical form in GB/P&P. The arrows in diagrams… merely represent the associations between argument positions in the semantic representations and the referring expressions in the syntax.

The "direct linking" and "inverse linking" between semantics and syntax that Gattei et al. (2015) and Bornkessel and Schelewsky (2006) refer to in the eADM model seem to be based on a literalist derivational algorithm that was not intended by Van Valin and LaPolla (1997). Van Valin and LaPolla do of course have a linking theory between semantic and syntactic representations, but it is not based on deriving one representation from the other in a linear fashion, which in turn leads to either direct or inverse linkings. Furthermore, Gattei et al. refer to "inverse linkings" even in sentences in which there is only one macrorole, as with Class III psych verbs. But, Bornkessel and Schelewsky (2006) claim that "inverse linkings" are not possible when a logical structure has only one macrorole. Because these processing accounts currently have some inconsistencies in terms of their application of Role and Reference Grammar (Van Valin and LaPolla 1997), a different framework will be used in the current study.

I argue that the word order/verb type processing generalizations in Gattei et al. (2015) can be explained through the interaction between a thematic hierarchy and

syntactic templates in a Spanish speaker's linguistic system. Like Belletti and Rizzi (1998), I assume that the process of linking semantics to syntax involves "encoding intrinsic thematic prominence into configurational prominence" (344), and that this alignment of prominence guides sentence comprehension. When reading sentences, comprehenders' default prediction is that the relative prominence of thematic roles will be preserved in syntax through their appearance in respectively prominent structural positions.

One way of reconceptualizing the syntactic-semantic prominence of arguments in incremental sentence processing is in terms of their topicality. Givón (1984) argues that an argument's syntactic position in a sentence reflects how topical it is. Since subjects are generally more topical than objects in discourse, they tend to appear in more syntactically prominent positions (Givón 1984). However, if an object is left-dislocated and precedes the subject (e.g., OVS or OSV word order), Givón (1984) contends that it "competes with the subject for the focus of attention" and "reflects the higher topicality of the non-subject" (757). To match this high topicality of an argument in a prominent syntactic position, the object argument should ideally have high semantic prominence (e.g., Belletti and Rizzi 1988), which can be determined according to a thematic hierarchy. The alignment of syntactic and semantic prominence motivates the tendencies that comprehenders rely on when making predictions during incremental sentence processing. Put differently, the default assumption in sentence processing is that core arguments are organized canonically in a way that balances their syntactic and semantic prominence.

Belletti and Rizzi's (1988) thematic hierarchy only requires slight modification to be applied to the linguistic context in Gattei et al. (2015) and the current study, both of

which focus on verbs that take dative objects. As shown in (9), the thematic role of "recipient" was added since this is the role of dative objects with action verbs such as *escribir* 'write'. For example, in the sentence "Tyler wrote a letter to Sam," Sam is a dative object recipient. This role contrasts with the dative object experiencer role of psych verbs such as *importar* 'matter'.

(9) Agent > Experiencer > Recipient|Theme

Although many thematic hierarchies distinguish recipients from themes (Levin and Rappaport Hovav 2005), they are placed on the same level since they do not co-occur in the same sentence in this study. What this hierarchy indicates is the following: Agents are more prominent than Experiencers, which in turn are more prominent than Recipients and Themes.

Based on the results from Gattei et al. (2015), I hypothesize that Spanish speakers rely on this hierarchy in conjunction with case cues and subject/object positioning to assign thematic roles to arguments during incremental sentence processing, which consequently leads to specific verb type predictions according to canonical patterns. This will be elaborated using the following example sentences below, which follow Gattei et al.'s (2015) canonical and non-canonical distribution.

(10) **canonical**

a. SVO/Action: *Brenda le canta a Carmen y no entiende la razón*.

b. OVS/Psych: *A Brenda le importa Carmen y no entiende la razón*.

non-canonical

c. SVO/Psych: *Brenda le importa a Carmen y no entiende la razón*.

d. OVS/Action: *A Brenda le canta Carmen y no entiende la razón*.

When reading (10a), Spanish speakers encounter the sentence-initial NP *Brenda* and assume that it has nominative case because it is not preceded by the object marker *a*. If it has nominative case and is sentence-initial, it can only be the subject (Van Valin and LaPolla 1997). This information is computed before any thematic relations are mapped (Bornkessel and Schlesewsky 2006). Because the cues related to grammatical function and case indicate that the argument *Brenda* has high syntactic prominence, it is also presumed to have high thematic prominence according to (9), because this will align syntactic and semantic prominence (Belletti and Rizzi 1988). The high syntactic prominence of the nominative subject *Brenda* leads to the default assumption that this argument has the highest thematic role that is compatible with a nominative subject: Agent. Once the thematic prominence of the argument is computed, the type of verb can be predicted. Agents are compatible thematic roles with action verbs, but not psych verbs, which leads to the prediction that an action verb will appear. The assignment of a thematic role to *Brenda* and the prediction regarding verb type occur during phase 2 of processing (Bornkessel and Schlesewsky 2006). Based on these assumptions, if a subject-initial sentence is followed by an action verb (e.g., *canta*), as in (10a), processing continues without issue because no revision is required to the original thematic interpretation of *Brenda* as an Agent. If the psych verb *importa* appears instead, as in (10c), thematic prominence must be reanalyzed. Since psych verbs do not take an Agent as an argument, the original thematic interpretation of *Brenda* must have been incorrect. The reader is forced to reinterpret (10a) as the non-canonical (10c) in which the syntactically-prominent *Brenda* has a thematic role with low prominence: Theme. This reanalysis causes a processing delay.

In an object-initial sentence such as (10b), expectations regarding verb type are reversed. When encountering the first constituent *A Brenda*, it is determined to be an object argument because it is marked with the object marker *a*. Since this object is at the beginning of a sentence in a highly prominent syntactic position (Givón 1984), it is assumed to be quite prominent semantically as well, because this would preserve prominence (e.g., Belletti and Rizzi 1988). In phase 2, thematic prominence is computed based by assigning it the highest compatible role. Because it is marked as an object, it cannot be an Agent. The next most prominent role is experiencer, and since this role is compatible with objects, the argument is determined to be an object experiencer. At this point, the verb is predicted to be a psych verb since only psych verbs have object experiencer arguments. If the psych verb *importa* appears in the sentence, as in (10b), processing continues without issue. If the action verb *canta* appears instead, as in (10d), thematic prominence must be reanalyzed, which causes a delay.

The reinterpretation of Gattei et al.'s (2015) results conserves the same generalizations regarding verb type prediction in canonical and non-canonical sentences. Both my interpretation and theirs ultimately center around maintaining thematic prominence of arguments based on their linear position in the sentence. However, my revised theory will be used in the current study because it does not carry with it all of the assumptions of Role and Reference Grammar (Van Valin and LaPolla 1997), which makes it more flexible and easier to amend if need be. In the next section, I will discuss L2 Spanish research that is relevant to the issue of word order/verb type canonicity.

1.3 Relevant L2 research related to Spanish word order/verb type associations

While research related to canonicity at the intersection of syntax and semantics has become more popular in L1 studies (e.g., Bornkessel and Schlewesky 2006; Gattei et al. 2015, 2015b, 2017), L2 research at this intersection has focused mostly on grammaticality/acceptability judgments and L2 errors (e.g., Gómez Soler 2010; Kanwit and Lubbers Quesada 2017; Montrul 1998). For example, Gómez Soler (2014) found that near-native and native Spanish speakers rely on discourse context to determine whether Experiencer-Verb-Theme (EVT) or Theme-Verb-Experiencer (TVE) argument order is more acceptable. When the experiencer is topical in the discourse, they accept EVT order more, and when the Theme is more topical, they accept the TVE order more. This finding supports the theory in the previous section that the first argument in the sentence is linked to topicality in Spanish (Givón 1984). Gómez Soler (2015) also found that all levels of L2 Spanish learners and native Spanish speakers disprefer the argument order Experiencer-Verb-Causer (EVC), as in the sentence **A Ana asustó Nico*. These findings show that L2 learners have or can acquire target-like knowledge related to argument order and verb type in Spanish, at least when provided a discourse context. Nevertheless, discourse context is thought to be relevant in phase 3 of processing (Bornkessel and Schlesewsky 2006), which will not be a focus of this study. Discourse context could obscure what is happening during phases 1 and 2, in which syntactic structure and thematic relations are computed (Bornkessel and Schlewesky 2006). Finally, although the very advanced learners in Gómez Soler's (2014, 2015) work show knowledge of how syntax and semantics interact in different discourse contexts, it is not safe to assume that offline language knowledge or judgments will be relevant to real-time sentence

processing. VanPatten and Jegerski (2010: 8) comment that the L2 acquisition of grammatical knowledge "does not automatically entail the processing of something related," and Clahsen and Felser (2017) point out that L2 learners often have difficulty applying their grammatical knowledge in real time.

Kanwit and Lubbers Quesada (2017) will be discussed because their study examined L2 errors/grammatical knowledge related to psych verbs and they recorded global response times, which could be relevant to the present study. Specifically, they compared the acceptability judgments of Class III psych verbs between L1 and L2 Spanish speakers and used E-prime to analyze the global response times of judgments. All three participant groups in Kanwit and Lubbers Quesada—low proficiency non-native speakers, high proficiency non-native speakers, and native speakers—rated sentences in which the dative object experiencer was preceded by the dative *a* to be acceptable (e.g., ***A Juan*** *le gusta Antonio*); this is in line with standard Spanish grammar. In sentences in which the dative marker was absent, which made them ungrammatical (e.g., **Juan le gusta Antonio*), there was a significant difference in ratings between all three groups. On a five-point scale (5 being most acceptable), native speakers rated them as 2.66, high non-natives rated them as 3.18, and low non-natives rated them as 4.16. The omission of a dative marker with this class of verb was salient and particularly ungrammatical for native speakers. For them, *a* omission before a dative object experiencer was more unacceptable than other errors involving verb agreement or pronoun use.

Kanwit and Lubbers Quesada (2017: 17) speculate that the higher acceptability of *a* omission among non-native speakers could be a result of the "phonetically minimal nature of the *a*," which leads to low perceptibility in the oral input that they receive. With

regard to global response times to the acceptability judgments, the native speakers and high non-native speakers patterned together; the presence of *a* in a sentence with a Class III psych verb resulted in significantly faster response times when compared to the reading times of ungrammatical sentences without the *a*. The low non-native speakers' response times did not change based on the presence or absence of *a*, but recall that this group did consider the absence of *a* to be an error. With the exception of the low non-native group, the response time results of all three groups are in line with a commonly observed pattern in sentence processing: grammatical sentences are processed more quickly than ungrammatical sentences (Gattei et al. 2015). A limitation in the study design of Kanwit and Lubbers Quesada (2017) is that it does not allow for a detailed understanding of real-time sentence processing because reaction times were not recorded for separate words or segments in sentences and the sentences sometimes varied in multiple aspects. Therefore, it is not possible to determine exactly what factors or combination of factors affected the reaction times.

2. The Current Study

This focus on acceptability/grammaticality and errors has been a dominant trend in L2 research over the past several decades, as pointed out by Erdocia et al. (2014). We know very little about L2 learners' knowledge of variable linguistic patterns within the realm of grammaticality and how this knowledge is employed in real time. Additionally, the need for a more thorough understanding of L2 sentence processing in addition to offline judgments has been identified by several scholars (e.g., Clahsen and Felser 2006; Jegerski and VanPatten 2014). Based on the native speaker findings from Gattei et al. (2015, 2017), the goal of the current study is to understand whether L2 learners of

Spanish are sensitive to canonical and non-canonical word order/verb type patterns during real time sentence processing. This would answer the question as to whether L2 learners have implicit knowledge of canonical patterns in Spanish and whether they can use both syntactic and semantic prominence in order to make predictions about the lexical semantics of a verb. A second goal is to understand how this sensitivity might change with language proficiency. It is possible that beginner learners do not have the knowledge or the L2 processing ability to react to canonicity in real time, but advanced speakers do; this would support previous research that has shown that nativelike L2 processing is possible (e.g., Jegerski 2010; Hopp 2010). Alternatively, it could be that even advanced L2 Spanish learners process sentences in a qualitatively different way from native speakers, which would support the findings in other studies that report non-nativelike performance in an L2 even with advanced proficiency (Clahsen and Felser 2006; Granena and Long 2013). The examination of a wide range of L2 proficiencies in the present study will strengthen our understanding of the development of L2 processing, a topic which is not currently well understood (Clahsen and Felser 2006; Jegerski and VanPatten 2014). The research question that will guide this study is the following:

> In a self-paced reading task, do L2 learners of Spanish at differing proficiency levels (i.e., beginning, intermediate, advanced) demonstrate sensitivity to the interaction between word order and verb type in a way that reflects nativelike knowledge of canonical versus non-canonical patterns?

2.1 Predictions for L2 Processing

The *Shallow Structure Hypothesis* (Clahsen and Felser 2006) was formulated to account for differences in L1 and L2 processing. It maintains that L2 learners tend to rely more on "good enough" (Ferreira 2003), shallow processing strategies and do not compute syntactic structures as completely or efficiently (or "automatically") as native speakers. However, this hypothesis was based mostly on the L2 processing of complex structures such as ambiguous relative clauses and sentences with long-distance relationships between constituents, such as filler-gap dependencies (Clahsen and Felser 2017). More research is needed to understand the processing of core arguments (i.e., subjects, objects) and their relationship with the verb.

The idea that L2 learners tend to process sentences incompletely and inefficiently (Clahsen and Felser 2006; Hopp 2010) can be applied to the eADM (Bornkessel and Schlesewsky 2006) in order to predict how L2 learners might process the core relations in simple sentences in the present study. According to the eADM, phase 1 consists of incrementally identifying word categories (e.g., NP, verb) and activating a syntactic template (e.g., NP-V-NP). Phase 2 consists of using case cues to identify the grammatical function of words and mapping thematic roles onto the arguments. The model also assumes that the phases generally occur in order. Therefore, if L2 learners generally process sentences more incompletely/inefficiently than native speakers (Clahsen and Felser 2006), they are predicted to stumble more with phase 2 than phase 1. They may be able to identify word categories and activate a syntactic template, but they may fail to complete phase 2 and assign thematic roles. Even though L2 learners have been shown to

have some knowledge of the relationship between word order and verb type in Spanish (Gómez Soler 2015), they may fail to use this knowledge in real time to assign thematic relations to arguments in an effort to align syntactic and semantic prominence. It is possible that L2 learners will become more efficient and process sentences more completely with higher proficiency, however, which is a possibility that the *Shallow Structure Hypothesis* (Clahsen and Felser 2006) allows for.

2.2 Method

2.2.1 Participants

The present study consists of three groups of native English speakers who learned Spanish as an L2. All participants were late L2 learners, which in this study means that they acquired Spanish after the age of 12. This was selected as a cutoff point given that 12 years old is the age of onset after which learners of Spanish are consistently identifiable as non-native speakers with regard to their knowledge of morphosyntax in Granena and Long (2013). People who grew up bilingual or as heritage speakers of another language were excluded from the study. Since one of the objectives is to understand how sentence processing changes according to language proficiency, L2 learners were initially recruited based on their estimated experience with Spanish. The lowest level group consisted of 32 university students enrolled in a fourth-semester intermediate Spanish language course. The second group of 32 students was recruited from advanced classes within the Spanish major and minor programs. To be admitted to these advanced classes, students must have successfully completed an advanced Spanish grammar and composition course, which means they were at least two semesters beyond the intermediate students in terms of Spanish experience. The final group of 32 L2

learners consisted of individuals with an MA or PhD in some field of Hispanic Studies. However, people who studied Hispanic Linguistics as their main MA/PhD focus were not recruited since they might have been more likely to identify the purpose of the study, which could have negatively affected the results.

Although participants were initially recruited based on their academic experience with Spanish, all participants also completed a shortened version of the *Diploma de Español como Lengua Extranjera* (DELE) as a measure of their reading proficiency in Spanish. The DELE was considered to be an appropriate measure of language proficiency for the present study since the focus is sentence processing in written Spanish, and this test has been used to estimate proficiency in previous L2 processing studies (e.g., Jegerski 2010). The proficiency test consisted of three different multiple-choice cloze activities of increasing difficulty. There were 34 points total.

As a control, 32 native Spanish speakers also participated in the study. They were recruited based on my personal knowledge of their language background, and all of them had at least a BA degree. Thirty of these 32 native speakers were living full time in the United States at the time, and the other two lived permanently in Spain and completed the reading tasks when I visited Spain in 2019. This native speaker group consisted of individuals from Spain, Mexico, Colombia, Argentina, and Ecuador. The mixing of different dialects was not considered to be a problem since the canonical and non-canonical word order/verb type associations have not been reported to vary by region (Gutiérrez-Bravo 2007). In other words, throughout the Spanish-speaking world, the combinations SVO/Action verb and OVS/Psych verb are considered canonical, while SVO/Psych and OVS/Action are non-canonical (Gattei et al. 2015; Gutiérrez-Bravo

2007). All of the participants self-identified as native speakers, which for the purposes of this study meant that they all grew up as monolingual Spanish speakers until at least 12. None of the participants had lived in a predominantly English-speaking country before the age of 18.

As an additional screening measure, all participants completed a brief language background questionnaire to collect demographic information and make sure that they would be eligible for the study. A summary of the participants' demographics and their results from the DELE proficiency test are reported in Table 2.2.

Table 2.2. Demographics and proficiency results of participants

Spanish level	Number	Gender (m/f)	Average age	Average Proficiency Test Score (max = 34)	Average # years studying Spanish
4th-semester Spanish	32	13/15	19	12.8	4.2
Spanish majors/ minors	32	8/26	20.3	16.6	6.7
Spanish MA/PhD	32	11/21	41.6	27.7	26.9
Native Spanish speakers	32	14/18	38.5	32.4	N/A

The 4th-semester Spanish students averaged 12.8/34 on the proficiency test, the Spanish majors/minors averaged 16.6/34, the Spanish MA/PhD group averaged 27.7/34, and the native Spanish speaker group averaged 32.4/34. Clearly, there is not an even distribution between the groups in terms of proficiency. There is a significant gap in proficiency between the Spanish majors/minors and the Spanish MA/PhDs, for example, which is a

limitation in the study design. Nevertheless, a one-way analysis of variance (ANOVA) confirmed that there was a main effect of Spanish level ($F_{3,124} = 253.6$, $p < .001$). A post-hoc Tukey test revealed a significant difference between all groups ($p < .001$ for all pairwise comparisons). To simplify discussion throughout this dissertation, the three different groups of L2 learners (4th-semester Spanish; Spanish majors/minors; Spanish MA/PhD) will be referred to as **beginner**, **intermediate**, and **advanced**. These categorizations will be used simply for convenience and do not necessarily correspond to any institutional proficiency scale (e.g., ACTFL proficiency scale).

2.2.2 Materials

The materials in this study were a modified version of those from Gattei et al. (2017). The two independent variables were word order and verb type, each having two levels. This resulted in a 2 x 2 design with four conditions: SVO/Action verb, SVO/Psych verb, OVS/Action verb, OVS/Psych verb. An example of each condition is shown in (11).

(11) a. SVO/Action (canonical): *Brenda le canta a Carmen y no entiende la razón.*

b. SVO/Psych (non-canonical): *Brenda le importa a Carmen y no entiende la razón.*

c. OVS/Action (non-canonical): *A Brenda le canta Carmen y no entiende la razón.*

d. OVS/Psych (canonical): *A Brenda le importa Carmen y no entiende la razón.*

The four conditions in (11) represent what is known as an item in a psycholinguistic experiment. To ensure that learners reacted to the linguistic conditions and not the specific names *Brenda*/*Carmen* or verbs *cantar*/*importar*, a total of 24 different items were created. The pairs of names were unique between items, and traditional male names and traditional female names were not mixed within items so that subconscious gender dynamics between men and women would not influence the interpretation of sentences. With regard to the verbs, it is important to note that each verb was repeated twice. This is because many of the psych and action verbs that take dative objects from Gattei et al. (2017) were uncommon and would have been unfamiliar to many beginner and intermediate L2 Spanish learners. Therefore, instead of using 24 different psych and 24 different action verbs, a total of 12 of each type were used, with one repetition of each verb in two different items.

The 24 items consisting of four conditions were distributed across four lists using a Latin Square design. This ensured that only one of every four participants would read exactly the same target sentences. A total of 40 filler sentences were also added to the experiment in order to counterbalance the target sentences. Twenty-four of the fillers were superficially similar to target sentences, but they uniquely contained ditransitive verbs, which means that both indirect objects *and* direct objects were present. The addition of these factors was meant to distract participants from identifying the target sentences, which did not contain ditransitive verbs/direct objects. These distractor sentences were also balanced based on word order: half SVO, half OVS. An example is provided is (12).

(12) Pedro le mostró el documento a Romeo antes de imprimirlo.

'Pedro showed Romeo the document before printing it.'

An additional 16 filler sentences that were unrelated to the experiment were included. After applying the Latin Square design, the target sentences and the fillers were also randomized for each participant in order to ensure that any effect caused by a certain condition was not a result of the order in which sentences were presented. Both the Latin Square distribution and randomization were completed with the software Linger (Rohde 2001). Finally, in order to encourage participants to remain focused on sentence comprehension throughout the study, a true/false question appeared after all target and filler sentences. The comprehension questions were designed with the intention of not drawing attention to either word order or verb type manipulations. For example, the question that followed any of the target items from (11) is shown in (13).

(13) Las dos personas entienden la razón.

Cierto Falso

'Both people understand the reason (why).'

'True' 'False'

The correct answer to the question in (13) would have been *Falso* 'false'. Half of the comprehension questions required a *Cierto* 'true' response, and the other half, a *Falso* 'false' response. A complete set of stimuli for this task is provided in Appendix A.

2.2.3 Methodology

To compare L2 learners' reactions to the four different conditions above, the methodology known as self-paced reading (SPR) was employed with the use of the software Linger (Rohde 2001). With SPR, participants read sentences word-by-word or

in segments at their own pace, and the time of each word or segment is recorded. This allows for a precise analysis of relative processing difficulty between conditions. The sentences in this task were divided into segments, which diverges from the word-by-word division used in Gattei et al. (2015). The reason for this difference is that the beginner L2 group in the present study had a fairly low proficiency, and reading sentences in segments was predicted to ease the overall processing burden for them while still allowing for a sound measurement of data. Table 2.3 illustrates how the target sentences in (11) were divided into segments or "regions."

Table 2.3. Sample set of stimuli with region labels

	SVO					
	Brenda	*le canta/ le importa*	*a Carmen*	*y*	*no entiende*	*la razón*
	'Brenda'	'sings/ matters'	'to Carmen'	'and'	'doesn't understand'	'the reason'
	OVS					
	A Brenda	*le canta/ le importa*	*Carmen*	*y*	*no entiende*	*la razón*
	'To Brenda'	'sings/ matters'	Carmen	'and'	'doesn't understand'	'the reason'
Region:	0	1	2	3	4	5

Verb Type Key:

cantar 'sing' = Action verb *importar* 'matter' = Psych verb

Region 0 contains a bare NP argument in SVO conditions and an object-marked NP in OVS conditions. Region 1 either contains a psych verb or an action verb. If speakers are

sensitive to the interaction between word order and verb type based on canonical patterns, they have enough information to react to this interaction upon reading region 1. As Gattei et al. (2015) argued, as soon as native speakers interpret the grammatical function of the first NP, they predict what type of verb will appear based on canonical syntax-semantics alignments. If the NP is bare, it is interpreted as a grammatical subject, and native speakers expect an action verb; if the NP is preceded by the marker *a*, it is interpreted as a grammatical object and native speakers expect a psych verb. Reading times would be expected to be faster at region 1 when expectations are met as opposed to when they are not met (Gattei et al. 2015). Although participants have enough information to assess whether their verb type expectations are met at region 1, they often do not react immediately at the region of interest. In SPR, the effect from the target region is commonly observed in the following region or the follow two regions; this is known as the "spill-over effect" (Keating and Jegerski 2015). Therefore, the spillover regions 2 and 3 will be the main regions of interest. Regions 4 and 5 were added to make complete sentences and avoid "wrap-up effects" (Just and Carpenter 1980). Regions 3-5 are identical in all four conditions within each item.

2.2.4 Procedure

Participants first completed a language background questionnaire in order to collect demographic information and to ensure that they were either late L2 Spanish learners who spoke English as a first language or native Spanish speakers (in the case of the control group). Next, they completed the SPR task, followed by the DELE reading proficiency test. Participants were paid 10 US dollars for a 40–60 minute session.

Before beginning the experiment, participants read an overview of the procedure

and they were asked to read sentences at a natural pace so that they could comprehend what they read. They were given the opportunity to ask for any clarifications before beginning. The SPR task was presented on a 15.4" Macbook Pro laptop computer using the software Linger (Rohde 2001). All sentences were masked and presented in size 24 font with a moving window display. This means that each sentence was presented as a series of dashes (e.g., ----------), and the participants used the space bar to reveal each segment in the sentence in isolation, from left to right. After reading the last segment in a sentence, a true/false comprehension prompt appeared on the screen. The comprehension prompt was related to some non-target aspect of the sentence (i.e., the comprehension question did not draw participants' attention to either word order or verb type manipulations). Participants pressed the equidistant letters 'D' or 'K'[5] on the keyboard to indicate the truth value of the prompt. The message *D para cierto* 'D for true' and *K para falso* 'K for false' appeared at the bottom of each trial. Feedback regarding the correctness of the response was not given. In order to become familiarized with the format of the experiment, participants completed five practice sentences in English and five in Spanish prior to beginning the experiment. These practice sentences were also followed by true/false comprehension questions. The participants then completed the SPR task consisting of 64 sentences (24 target sentences, 40 filler sentences). After the presentation of the 50th sentence, a message appeared on the screen and participants were given the opportunity to take a break in order to prevent reading

[5] The two default response keys for comprehension questions are 'F' and 'J' in Linger, but these were not used in the current study because participants might have erroneously associated the letter 'F' with *falso*, which could have caused confusion. The letters 'D' and 'K' were chosen because they were neutral and equidistant on the keyboard.

fatigue.

2.2.5 Analysis

Reading time data, measured in milliseconds, was analyzed only from the trials (i.e., sentences) in which the comprehension question was answered correctly, since a measure of processing assumes comprehension. The comprehension rates for target trials were 85.1% for beginners, 90.1% for intermediates, 94.5% for advanced, and 91.9% for natives, so these numbers represent the percentage of target trials in each group that were included in the analysis. To account for extreme data that was not likely to be representative of a group, residuals that deviated more than 3 standard deviations from the mean were not included in the analysis; this resulted in the removal of 1.87% of the data. A more aggressive data trimming measure was not taken since there were only 32 participants in each group with a potential 24 target data points for each. Also, recall that the incorrectly answered trials were previously removed from the analysis, so the exclusion of more tokens from a relatively small data pool in each population might not have allowed for robust findings. Beyond the context of this specific study, a non-aggressive approach to data trimming approach is also promoted by Baayen and Milin (2010) and Keating and Jegerski (2015), especially when preparing data for mixed models.

Because raw reading times often do not have a normal distribution of their residuals, reading times were log-transformed (Hofmeister and Vasishth 2014). Specifically, the log residual reading times were the measurement of analysis, following Hofmeister and Vasishth (2014). In addition, reading times were normalized using an R script developed by Jaeger (2008) in order to account for varying word length in

segments (not all psych and action verbs were of the same character length), the position of segments within a sentence, and the position of specific sentences within a list. These normalizations helped neutralize the effect that these extraneous factors might play in the analysis. Then, using R, a mixed effects model was constructed for each population with log residual reading times as the dependent variable and Verb Type and Word Order as fixed effects. In addition, following Jaeger (2008), "previous segments" were added as a fixed effect in order to understand the influence of specific words or names in previous segments in target sentences. Since it is possible that baseline reading times could vary between target sentences and participants, "item" and "subject" were respectively added as random effects. The results of the experiment will be presented as estimates (β), standard errors, *t*-values, and *p*-values. Results that have a *p*-value lower than .05 will be considered an indication of a significant difference in performance, and those between .05 and .08 will be considered marginally significant.

3. Results

3.1 Results at Region 2

The mean log residual reading times for the four different conditions are reported by group in Figure 2.1 Each graph is divided into regions (see Table 2.3 for an example set of stimuli) and includes standard error bars.

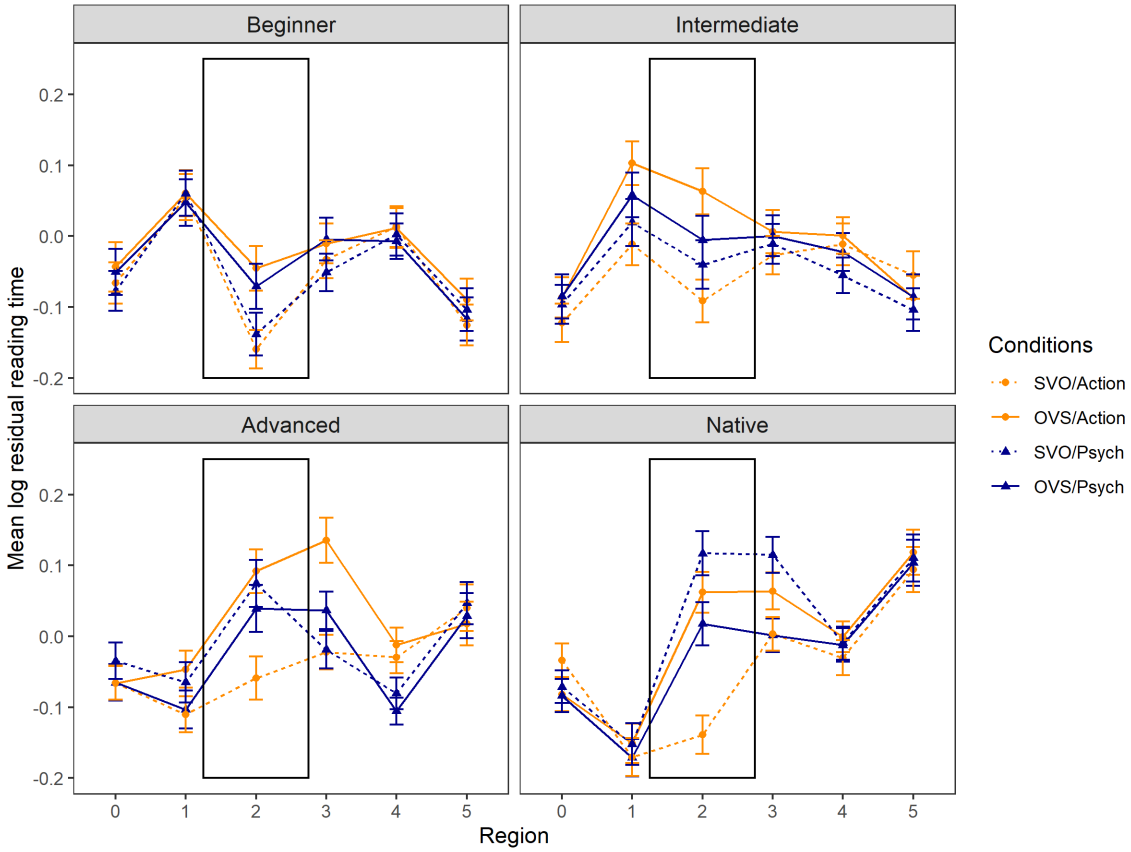


Figure 2.1. Mean log residual reading times for the four different Word Order/Verb Type combinations (SVO/Action; OVS/Action; SVO/Psych; OVS/Psych) for each population, with a focus on region 2.

Recall that regions 0 and 1 provide enough information for native speakers to determine whether a word order/verb type combination is canonical or non-canonical (Gattei et al. 2015). For example, if the dative object marker *a* 'to' precedes the argument in region 1, the sentence is likely to be OVS word order, and a participant may predict that a psych verb will appear. Alternatively, if the argument in region 0 lacks an object marker, it could be assumed to be the grammatical subject, and therefore a participant may predict that an action verb will appear. If L2 participants are similarly sensitive to word order/verb type patterns, they would also make verb-type predictions based on the information in the first two regions. However, because of participants' tendency to

anticipate pressing the spacebar to reveal more segments before completely processing information, reactions often "spill over" into the following one or two regions (Keating and Jegerski 2015). Therefore, while significant reactions are not observed in region 1, the first post-verbal spillover region, region 2, is much more revealing. In region 2, there was a significant finding across all groups (beginner; intermediate; advanced; native): on average, SVO sentences were read faster than in OVS sentences (**Beginner**: β = -0.11, SE = 0.04, t = -2.56, p = .01; **Intermediate**: β = -0.13, SE = 0.04, t = -2.9, p = .004; **Advanced**: β = -0.15, SE = .04, t = -3.49, p < .001; **Native:** β = -0.19, SE = 0.04, t = -5.01, p < .001). This shows that all groups were sensitive to the independent variable of word order.

In the beginner group, word order affected reading times independent of verb type: both SVO conditions patterned together (faster) and separately from the OVS conditions. A post-hoc Tukey pairwise comparison revealed that SVO/Action and OVS/Action are the only isolated pair of conditions that had a marginally significant difference in reading times (β = 0.11, SE = 0.04, t = 2.56, p = .05). In the intermediate group, however, there was a marginal interaction between word order and verb type (β = 0.11, SE = 0.06, t = 1.80, p = .07). Figure 2.1 shows that while SVO sentences clustered apart (they were read faster) from OVS sentences in the intermediate group, the clustering was not as tight within these two word orders as in the beginner group. This is a reflection of the marginal influence of verb type in the intermediate group. Nevertheless, a pairwise Tukey comparison indicates that there was only one pair of conditions that differed significantly, and this difference was driven by a word order variation: SVO/Action vs. OVS/Action (β = .13, SE = 0.04, t = 2.9, p = .02). In sum,

word order was clearly the most influential factor for both beginner and intermediate learners.

Like beginner and intermediate learners, advanced L2 and native speakers also distinguished sentences based on word order (On average, SVO sentences were read faster than OVS sentences). However, unlike the two groups with lower proficiency, the advanced and native groups were also sensitive to the interaction between word order and verb type (**Advanced**: β = 0.19, SE = 0.06, t = 3.11, p = .002; **Native**: β = 0.30, SE = 0.05, t = 5.54, p < .001). For example, a Post Hoc Tukey comparison revealed that advanced/natives read SVO sentences faster when they contained an action verb as opposed to a psych verb (**Advanced**: β = -0.14, SE = 0.04, t = -3.18, p = .009; **Native**: β = -0.25, SE = 0.04, t = 3.11, p < .001). This shows that verb type is a highly relevant piece of linguistic information for these groups. While the advanced and native participants' sentence processing was similar in many ways, native speakers showed an additional sensitivity to the distinction between SVO/Psych and OVS/Psych (β = -0.11, SE = 0.04, t = 2.82, p = .002)—the latter being read faster. In what was a somewhat surprising finding based on the results of Gattei et al. (2015), neither the advanced L2 learners nor native speakers significantly distinguished the non-canonical OVS/Action from the canonical OVS/Psych at this region.

While there are nuanced differences between the four groups, the most general difference is the ability to distinguish conditions based on the *interaction* between word order and verb type at region 2. This interaction is more clearly appreciated in Figure 2.2.

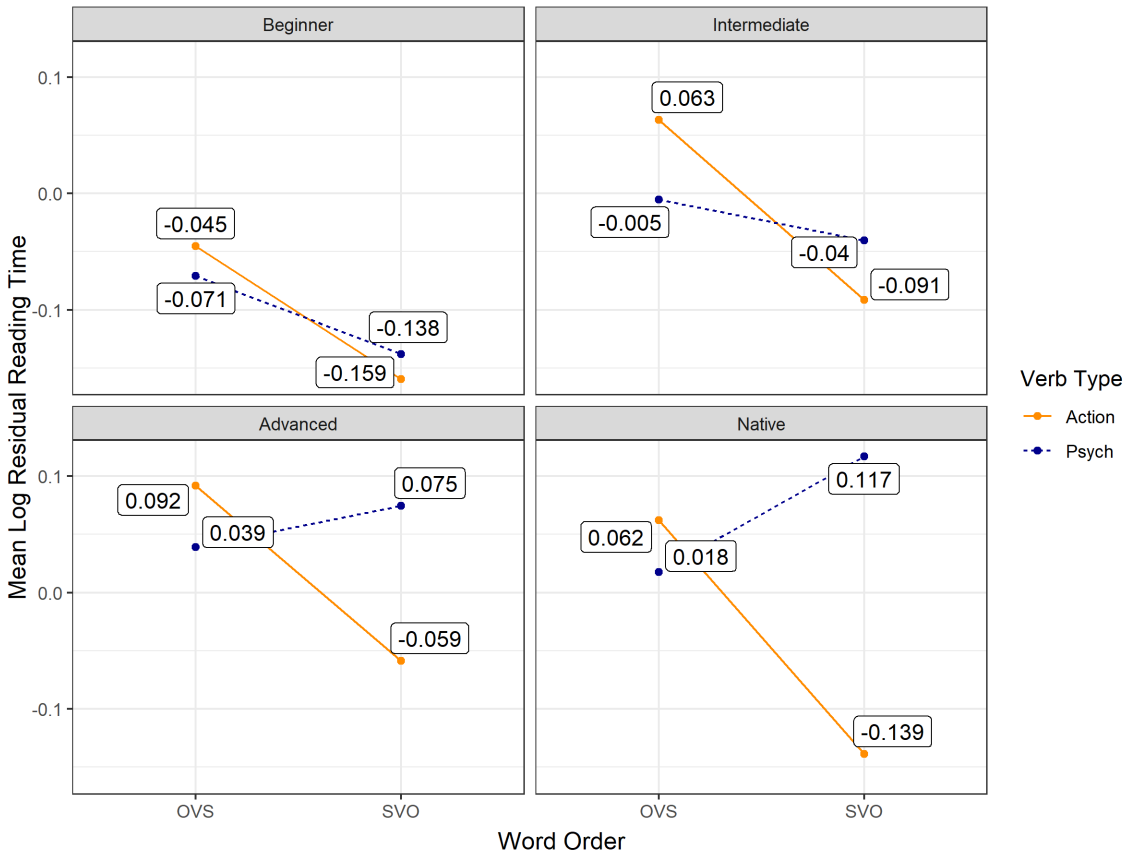


Figure 2.2. Interaction between word order and verb type at region 2 based on mean log residual reading times.

Recall that the interaction between word order and verb type was not significant in the beginner group, marginally significant in the intermediate group, and significant in both the advanced and native groups. The gradient sensitivity to this interaction based on Spanish proficiency is most obvious in the SVO conditions. While beginner and intermediate learners do not distinguish SVO/Action and SVO/Psych, advanced and native speakers' reaction to these conditions is polarized: reading times are significantly lower in SVO/Action sentences than in SVO/Psych ones.

3.2 Results at region 3

Region 3 is also relevant because it is the second spillover region after the target verbal region and may reveal lingering processing effects. The SPR results are repeated in Figure 2.3 with region 3 highlighted. For additional nuance, the interaction between variables in region 3 is shown in isolation in Figure 2.4.

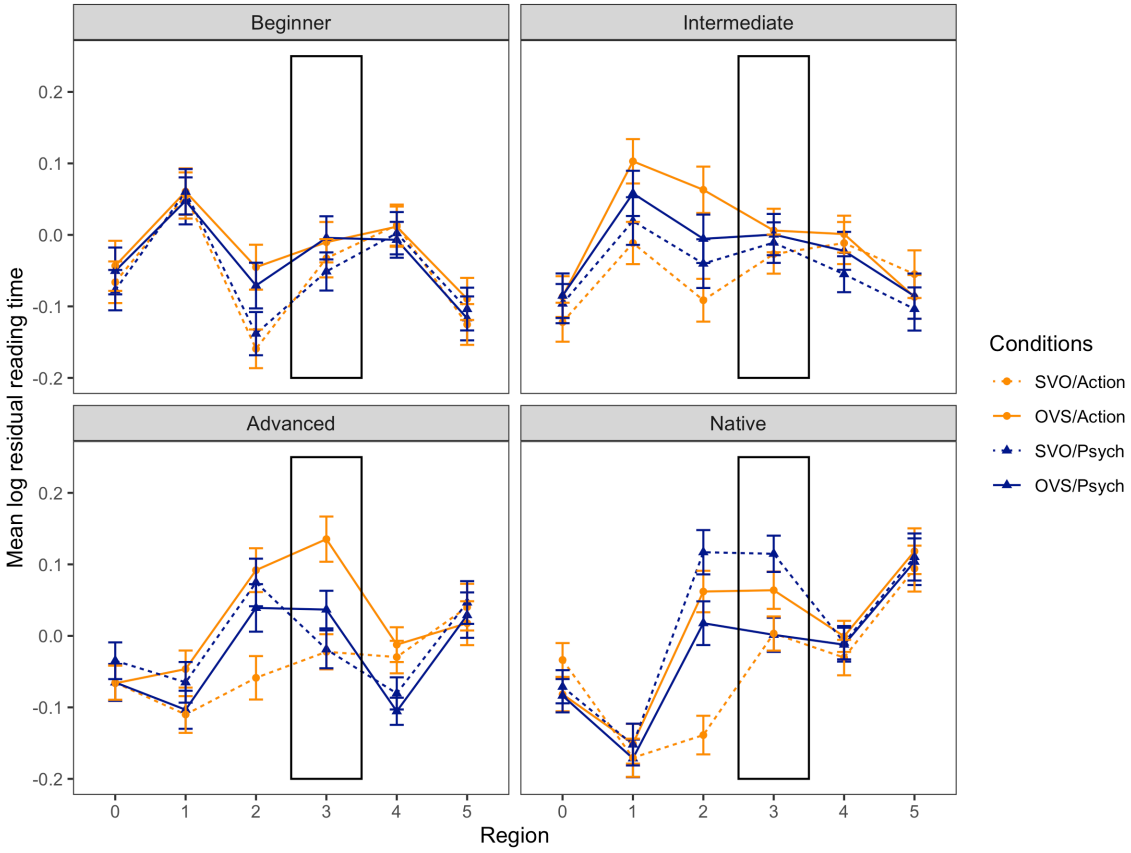


Figure 2.3. Mean log residual reading times for the four different Word Order/Verb Type combinations (SVO/Action; OVS/Action; SVO/Psych; OVS/Psych) for each population, with a focus on region 3.

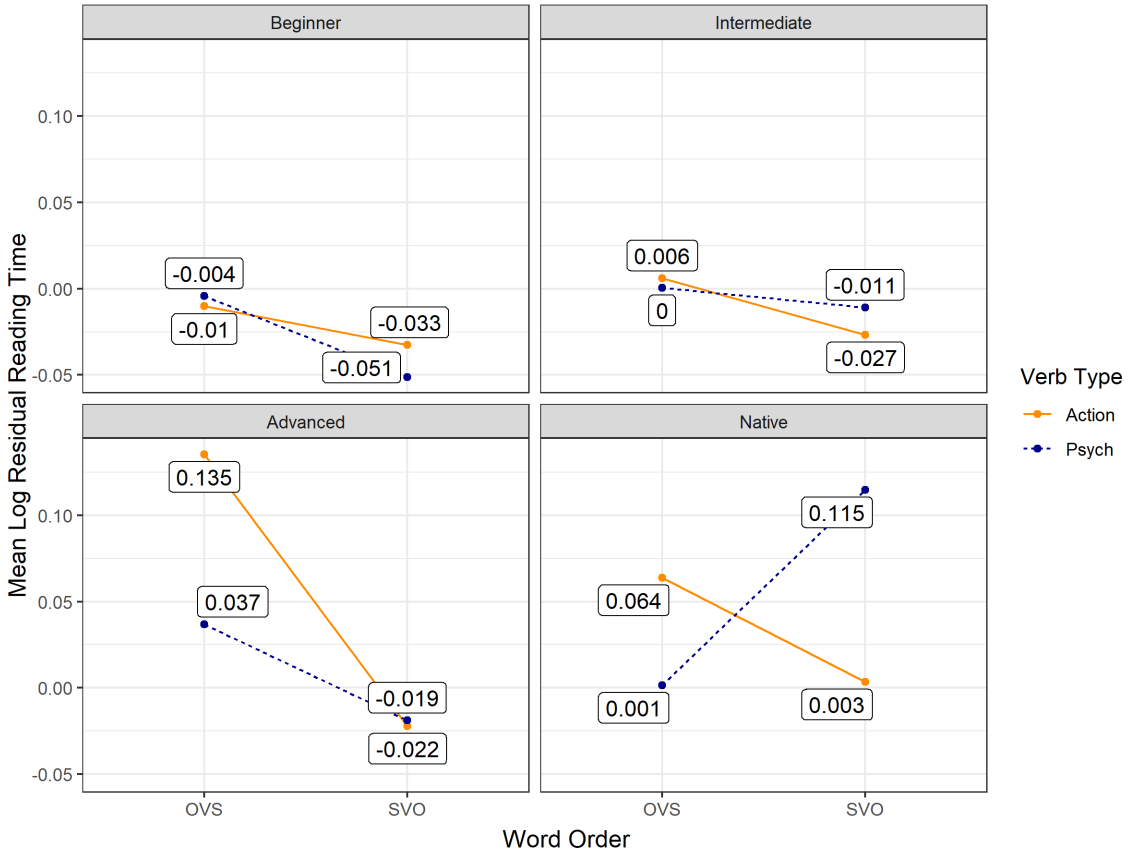


Figure 2.4. Interaction between word order and verb type at region 3 based on mean log residual reading times.

The beginner and intermediate groups did not show sensitivity to word order, verb type, or the interaction between these factors at region 3. This indicates that their reactions to the different conditions coalesced fairly quickly after being affected mostly by word order variations in region 2. The advanced and native groups, on the other hand, showed lingering effects at region 3, which is indicative of their increased sensitivity to the factors of word order and verb type. Nevertheless, unlike at region 2, these two groups' reactions were qualitatively quite different at region 3.

The most influential factor for the advanced group at region 3 was word order; SVO conditions were read faster than OVS ones, on average (β = -0.15, SE = 0.04, t = -

4.17, $p < .001$). There was also a marginal interaction between word order and verb type ($\beta = 0.10$, SE = 0.05, $t = 1.83$, $p = .07$), which seems to be mostly driven by an extreme reading delay in the non-canonical OVS/Action condition. This resulted in a difference between the non-canonical OVS/Action and canonical OVS/Psych ($\beta = 0.10$, SE = 0.04, $t = 2.59$, $p = .049$). The significant contrast between OVS/Action and SVO/Action that was seen in region 2 is sustained in region 3 ($\beta = 0.15$, SE = 0.04, $t = 4.17$, $p < .001$). A notable shift from region 2 to 3 in the advanced group is the loss in sensitivity between the two SVO conditions ($\beta = -0.001$, SE = 0.04, $t = -0.03$, $p = 1$); there is no longer a relative processing hindrance caused by the non-canonical SVO/Psych.

Unlike the advanced L2 learners, native speakers were not guided by word order as an isolated variable at region 3 ($\beta = -0.05$, SE = 0.03, $t = -1.56$, $p = .12$). Instead, they were predominantly guided by the interaction between word order and verb type ($\beta = .15$, SE = 0.05, $t = 3.24$, $p = .001$). The condition that caused the most processing difficulty at region 2, SVO/Psych, continued to do so at region 3. A post hoc Tukey analysis revealed that this non-canonical condition caused a significant processing delay in comparison to the two canonical patterns: SVO/Action ($\beta = -0.10$, SE = 0.03, $t = -2.82$, $p = .03$) and OVS/Psych ($\beta = -0.11$, SE = 0.03, $t = -3.05$, $p = .01$). Native speakers' processing does not appear to have been affected positively or negatively ($p > .05$) by the remaining non-canonical pattern, OVS/Action, which contrasts with advanced L2 participants' negative reaction to it. Despite these specific discrepancies, a commonality between advanced L2 learners is that a non-canonical pattern (OVS/action for advanced L2; SVO/psych for native) caused the greatest processing difficulty at region 3. No such effect based on word order/verb type canonicity was observed in beginner and intermediate groups.

3.3 Summary of results

Here the research question that guided this study is repeated:

> In a self-paced reading task, do L2 learners of Spanish at differing proficiency levels (i.e., beginning, intermediate, advanced) demonstrate sensitivity to the interaction between word order and verb type in a way that reflects nativelike knowledge of canonical versus non-canonical patterns?

Based on the results presented above, the answer to the question can be summarized in the following way:

> Yes, advanced L2 learners pattern like native speakers and demonstrate sensitivity to the interaction between word order and verb type, which is manifested as longer reading times at critical regions of sentences with non-canonical patterns. Specifically, the reading delay caused by the non-canonical SVO/psych in comparison to the canonical SVO/action seems to be the main driver of the word order/verb type interaction. In contrast, beginners and intermediate learners demonstrated, at best, a marginal sensitivity to the interaction between word order and verb type. Their processing is affected mostly by word order, with SVO sentences being processed most quickly.

4. Discussion

4.1 Beginner and Intermediate L2 learners

Data from the first spillover region (region 2) reveals that beginner L2 learners pay attention to variations in word order but not in verb type. Specifically, slower reading times in OVS contexts are indicative of processing difficulties with this word order,

which is not surprising based on the problems that L2 learners often have with object-initial sentences (e.g, VanPatten 1984). These learners recover from this processing delay quickly, however, showing no sign of word order effects at region 3. To summarize in terms of the eADM, beginner L2 learners' sensitivity to word order suggests that they are building basic syntactic templates, but they are not mapping different thematic roles onto arguments based on predictions related to the lexical semantics of the upcoming verb (Bornkessel and Schlesewsky 2006).

The processing delay caused by the *a* in OVS sentences may not have been expected based on the generalization that this marker is not salient for L2 learners. Kanwit and Lubbers Quesada (2017: 17) speculate that L2 learners' non-native knowledge regarding the dative marker *a* might be a result of its "phonetically minimal nature" in input. Montrul and Bowles's (2010) state more generally that "dative *a*-marking has low perceptual salience" (7). The results from the present study show that at least in an experimental reading task with segmented sentences, beginner L2 learners do notice the dative object marker *a* and suffer a processing delay because of it. It is a different question, however, whether these learners understand the function of this dative object marker, which is an issue that will be explored in Chapter 4.

Intermediate L2 learners react similarly to beginners, showing most sensitivity to word order cues. An initial object marker *a* in region 0 in OVS sentences results in slower reading times in the first spillover region (region 2) when compared to SVO sentences (which do not contain this marker). Additionally, the results for this group indicate an increasing sensitivity to the role of verb type and how in interacts with word order, which is evidenced by a marginal interaction between these factors at region 2.

This can be appreciated in Figure 2.1, which shows that the conditions are beginning to separate by verb type within the same word order. For example, within SVO conditions, sentences with action verbs have an average faster reading time than psych verbs; although this difference is not significant, it is trending in a nativelike direction based on canonical patterns (Gattei et al. 2015). The same is true for the OVS conditions in region 2. While not significant, the average reading times in OVS sentences are lower with psych verbs than with action verbs, which is a nativelike trend (Gattei et al. 2015). The combined effect of these two trends results in the marginal interaction between word order and verb type, but word order as an individual factor remains the most dominant. This interaction is interpreted as evidence that intermediate learners are beginning to map thematic relations onto syntactic templates in phase 2 of processing (Bornkessel and Schlewesky 2006), which is a sign of increasingly thorough and efficient computations (Clahsen and Felser 2006). Finally, as with the beginner group, effects related to word order and verb type are no longer observed beyond region 2, which suggests that their reaction to these factors is quite brief.

4.2 Advanced L2 Learners and Native Spanish Speakers

Advanced and native participants are also guided by word order as an isolated factor, but they also have a deep understanding of the relationship between word order and verb type in Spanish. On average, SVO sentences were read faster than OVS ones in region 2, which could reflect the fact that SVO is the predominant word order in both Spanish and English (Dryer 2013). This result might also be skewed by the particularly fast reading times in the SVO/Action conditions in both groups. This canonical pattern seems to have a special status, because it is read significantly faster than any other

condition, which includes the other canonical pattern based on standard Spanish, OVS/Psych (Gattei et al 2015). The same finding was reported in the second spillover region in Gattei et al. (2015). Therefore, the combined evidence from these two studies suggests that models based on word order/verb type canonicity require more nuance; non-canonical vs. canonical may still be a useful general distinction, but it may be more gradient than previously assumed.

Advanced/native participants' ability to effectively apply both word order and verb type knowledge in real time is most evident in SVO conditions. While SVO/Action results in the quickest reading times at region 2, SVO/Psych results in the second slowest reading times among the advanced learners, and the slowest among natives. The contrast between these two conditions can be explained by the hypothesis put forth in Section 1.2. When these highly proficient groups see a sentence-initial nominative NP in SVO conditions, they preemptively assign it the most prominent thematic role on Belletti and Rizzi's (1988) modified hierarchy, which is Agent. At this point, they have aligned the highly prominent syntactic position of the NP with a highly prominent thematic role, and they predict that an action verb will appear since these verbs contain the role Agent in their thematic inventory. If, after this prediction is made, a psych verb appears instead, a thematic reanalysis must occur during phase 2 of processing (Bornkessel and Schlesewsky 2006) because the role Agent is incompatible with psych verbs; this causes a processing delay. They must reanalyze the first NP as a Theme and the second NP as an Experiencer, which results in a non-canonical argument arrangement in which the least prominent thematic role (Theme) is mapped to the most prominent syntactic position (sentence-initial subject).

An interesting difference between the advanced L2 and native Spanish groups is that the contrast between SVO/Action and SVO/Psych is lost in the advanced group in region 3, but it is sustained in the native group. This suggests that advanced participants recover quickly from the reanalysis of thematic relations in the SVO/Psych condition. For them, conditions begin to cluster more by word order in region 3, with SVO conditions leading to quicker processing. In contrast, for native speakers, the reanalysis effect in the non-canonical SVO/Psych condition is stronger, and it continues to be one of the two most difficult conditions to process at region 3, along with the other non-canonical pattern, OVS/Action. The canonical patterns, however (SVO/Action and OVS/Psych) are both read significantly faster than SVO/Psych. This supports Gattei et al.'s (2015) finding that native Spanish speakers tend to process dative sentences based on the canonicity of the word order/verb type relationship.

In region 2, the OVS conditions cause less polarized reactions than SVO conditions in the advanced and native group. Neither group distinguished OVS/Action from OVS/Psych. In Gattei et al. (2015), this contrast was observed in the first spillover region, but appears to have been lost in the second spillover region. This can be seen in Figure 2.5, which is taken from Gattei et al. (2015). These authors used a word-by-word design as opposed to the segmented design, so their two spillover regions, the fifth and sixth regions (the boxed regions), roughly correspond to region 2 in the present study.

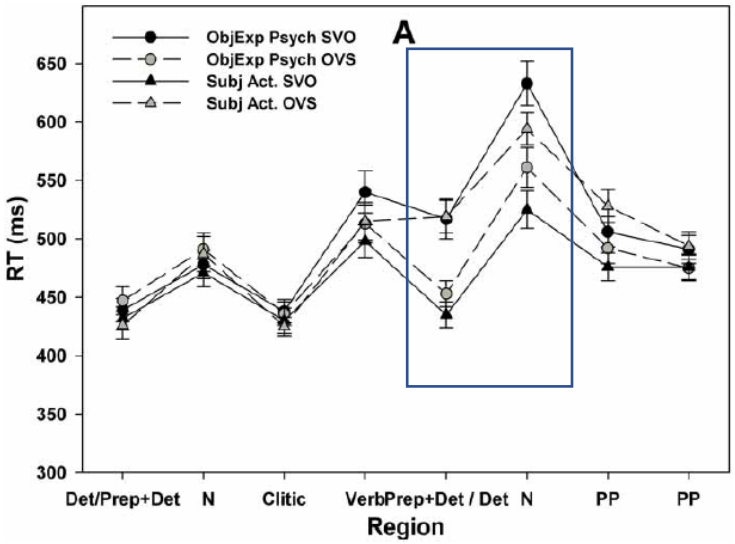


Figure 2.5. Mean reading times by condition in Gattei et al. (2015: 1996)

Although region five (first boxed region; first spillover) in Figure 2.5 shows the conditions clearly aligned by canonicity, the sixth region (second boxed region; second spillover) shows a distribution of conditions that is similar to that of the advanced and native groups in Figure 2.1; the difference between SVO conditions is extreme, while the difference between OVS conditions is more tempered. Based on this finding, it is not entirely surprising that the native speakers in the current study did not distinguish the two OVS conditions in region 2. The question is, if the pattern OVS/Psych is so well established as the canonical OVS order in Spanish (e.g., Gutiérrez-Bravo 2007), why does it not always lead to an obvious processing advantage over OVS/Action, the non-canonical OVS pattern? Bornkessel and Schlesewsky (2006) found a similar result in a German study related to word order/verb type interactions. In German, like in Spanish, object-initial sentences are the preferred and unmarked when using Class III psych verbs with dative object experiencers, but they are marked with action verbs (Bornkessel and Schlesewsky 2006). Based on this fact, Bornkessel and Schlesewsky (2006) expected to

find a clear processing advantage for psych verbs over action verbs in object-initial structures in an event-related brain potentials (ERP) study, but they found an N400 effect for both; this indicates that processing difficulty was experienced with all object-initial structures regardless of verb type. There was one crucial difference, however: the N400 effect was comparatively less pronounced in the object-initial sentences with psych verbs. Therefore, in the current study, it is possible that the advanced L2 learners and native Spanish speakers may have still relied on syntactic-semantic prominence to predict verb type. The processing advantage that OVS/psych was expected to have over OVS/action could have been muddled by the underlying disadvantage for *all* object-initial sentences (Bornkessel and Schlesewsky 2006). In sum, the general crosslinguistic processing advantage for subject-initial sentences over object-initial sentences (Bornkessel and Schlesewsky 2006) is a possible confounding factor in the analysis of the relationship between word order and verb type that will need to be considered in future research.

While there is no systematic distinction between OVS conditions in the present study, there was one exception in the advanced group in region 3. In fact, in this region advanced learners experienced the most extreme reading delay in the non-canonical condition OVS/Action, not SVO/Psych. OVS/Action caused such a significant delay that it stood alone as the most difficult when compared to the other three conditions. Because this was the only instance of a significant distinction between the two OVS condition in this study, coupled with the fact that this distinction was relatively fleeting in Gattei et al. (2015), it seems that the most powerful and enduring word order/verb type interaction in Spanish sentence comprehension is within SVO conditions. Consequently, the SVO/Action vs. SVO/Psych contrast may perhaps be the most reliable indicator of

nativelike processing at the syntax-semantics interface in Spanish. Beginners and intermediates do not yet have the knowledge or processing agility to map thematic roles to arguments and predict verbal semantics in real time.

5. Conclusion

This study documents the development of L2 processing in Spanish sentences with variable word order and verb type. The results show that advanced L2 Spanish learners have nativelike knowledge regarding the relationship between verb class and word order (Gómez Soler 2014), and that they can put this information to use in real time to assign thematic roles to arguments and predict what type of verb will appear. This is indicative of thorough processing during both phases 1 and 2 of sentence comprehension (Bornkessel and Schlesewsky 2006). The fact that advanced learners respond to word order/verb type canonicity in a way that is fundamentally similar to native speakers lends support to studies that have shown that nativelike processing is possible in an L2 (Hopp 2010; Jegerski 2010). Beginner/intermediate learners, on the other hand, principally depend on word order cues when reading sentences, which suggests that they process sentences less completely and/or less efficiently than native speakers (Clahsen and Felser 2006).

Chapter 3: The interaction between word order and verb type in L1 English

1. Background

Chapter 2 revealed that L2 learners become increasingly sensitive to the interaction between word order and verb type in Spanish as their proficiency increases. I argued that that before the advanced stage of acquisition, learners parse sentences without attention to thematic relations. At the advanced stage, L2 learners are able to map thematic relations according to syntactic cues, like native Spanish speakers. This interaction was most clear between SVO/Action and SVO/Psych conditions, with SVO/Action leading to significantly faster reading times. The question is: where did this knowledge come from? Did the advanced L2 learners become sensitive to the difference between these two conditions based on L2 Spanish input alone? Or, is it conceivable that these learners came equipped with this knowledge related to syntax-semantics mapping in their L1, but simply could not apply it in their L2 until reaching advanced proficiency? This latter hypothesis has not been considered in research that examines L1 English speakers' L2 acquisition of Spanish at the syntax-semantics interface.

1.1 Characterizations of English in L2 Spanish studies

In discussions of language transfer, researchers have most commonly considered L1 English to be an impediment in the L2 acquisition of variable word order in Spanish. This is due to a binary categorization of English as a "rigid" SVO language, and Spanish as a language with "flexible" word order (Isabelli 2008; Tight 2012). For example, Tight (2012) explains: "[W]hile English adheres strictly to an SVO word order for declarative

sentences, Spanish exhibits much more variability. In fact, SVO, SOV, OSV, OVS, VSO, and VOS structures are all possible in Spanish, subject to certain discourse and pragmatic considerations" (352). Gómez Soler (2015) echoes this generalization: "English does not have flexible word order like Spanish" (632). Therefore, the assumption has been that any nativelike knowledge that L2 learners develop related to Spanish word order flexibility could not possibly be transferred from L1 English. L1 English transfer has most often been hypothesized to be negative language transfer in word order studies (Isabelli 2008).

Scholars (e.g., Pascual y Cabo 2013) have also made clear contrasts between English and Spanish word order in the context of the L2 acquisition of Spanish psych verbs. The most common assumption is that Spanish psych verbs can be divided into three classes according to Belletti and Rizzi's (1998) tripartite categorization, which is shown in (1).

(1) **a**. Class I: Nominative experiencer, accusative theme (Exp-V-Theme)

María odia a Juan.

'María hates Juan.'

b. Class II: Nominative theme, accusative experiencer (Theme-V-Exp)

María preocupa a Juan.

'María worries Juan.'

c. Class III: Nominative theme, dative experiencer (Exp-V-Theme *or* Theme-Verb-Exp)

A María le gusta Juan *or* Juan le gusta a María.

'María likes Juan.' 'María likes Juan.'

Pascual y Cabo (2013) explains that the object-initial pattern with class III verbs (see (1c)) is not relevant in English: "…in English, being an SVO language, the thematic (semantic) mappings are never (syntactically) reversed. That is, they are mapped onto canonical SVO word order, irrespective of the type of psych-predicate" (163). Gómez Soler (2015: 639) goes into even further detail regarding the differences between class II and class III psych verbs in Spanish and English:

> English has the same stative/eventive alternation with psych verbs; however, the reflexes of this distinction are different in English and Spanish. In English, both classes II and III have only one possible order: CVE (Ana scares Nico) and TVE (Shoes are pleasing to Maria), respectively. Consequently, the restricted word orders of the participants' L1 will not provide them with enough information to understand the syntactic subtleties of these predicates in Spanish.

In Gómez Soler's (2015) study, some of her L2 participants showed nativelike knowledge of the difference between class II and III Spanish verbs, namely that class II verbs do not generally allow for a reversal of arguments (e.g, Experiencer-Verb-Causer (**A Nico asusta Ana*)) but class III verbs do, as shown in (1b-c). She concluded that L2 speakers' nativelike ability to distinguish the aspectual properties between eventive Class II and stative class III verbs came from universal grammar; English could not have provided them with the knowledge that class III psych verbs allows for more argument order flexibility because this class of verbs in English is "very infrequent if not an artifact of a formal register that no one actually speaks natively" (Gómez Soler 2010: 236). This characterization of Class III English psych verbs is only slightly less absolute than Montrul's (1998): "English lacks the third class of psych verbs and experiencers only surface as nominative or accusative" (35).

What emerges from the works cited above is a depiction of English as a syntactically rigid language (e.g, Isabelli 2008; Tight 2012) that either does not have Class III psych verbs at all (Montrul 1998) or does have them but they are so infrequent that English speakers do not have any native knowledge of these verbs outside of formal registers (Gómez Soler 2015). And, even if English has all three classes of psych verbs, there are no differences in the syntactic-semantic mappings; the word order is always SVO (Pascual y Cabo 2013).

1.2 The influence of an L1 on an L2

While language transfer is not the main focus of all of the studies mentioned in the previous section, implicit assumptions regarding language transfer can still be deduced by the way that the L1 and L2 are depicted. If the L1 is described in an L2 study, the L1 is assumed to be relevant to the acquisition of the L2. Therefore, even when scholars compare and contrast linguistic characteristics between an L1 and L2 without framing the discussion within a specific theory of language transfer, the default interpretation of these characterizations might be the following: crosslinguistic similarity between an L1 and L2 is more likely to lead to positive language transfer and target-like performance (Morett and MacWhinney 2013), while crosslinguistic dissimilarity between the languages is more likely to lead to negative language transfer and non-target-like performance. Applying this generalization to an L2 Spanish study, then, the natural assumption would be that Class III psych verbs would be harder to acquire in L2 Spanish if no such verbs exist in participants' L1 English (Montrul 1998). Additionally, learning to map thematic roles to both subject-initial and object-initial sentences in L2 Spanish would be assumed to be difficult if thematic roles are only mapped on an SVO word

order in participants' L1 English (Pascual y Cabo 2013). While these would be the default assumptions, the influence of an L1 in L2 acquisition cannot be completely understood without examining both languages empirically, as Hitz and Francis (2016) emphasize.

It is likely that the influence that L1 English might have on the L2 acquisition of variable word order and psych verbs in Spanish has not been examined experimentally because Spanish and English have been considered to be fundamentally different. For example, how would it be possible to experimentally compare participants' knowledge of Class III psych verbs in L1 English and L2 Spanish if English does not have these verbs (Montrul 1998)? Or, how would it be possible to compare participants' knowledge related to how different classes of verbs are variably mapped at the syntactic-semantic interface between English and Spanish if English only uses an SVO template (Pascual y Cabo 2013; Tight 2012)? Currently, these assumptions reflect the status quo in L2 Spanish studies. Nevertheless, there is research that suggests that English is not a *completely* rigid SVO language (Bates et al. 1982; Namboodiripad 2017), and there may also be several Class III psych verbs in English that have gone unrecognized. A reexamination of the intersection of word order and verb type in English is the first step toward a more thorough interpretation of L2 Spanish learners' results in Chapter 2 and potential language transfer between English and Spanish.

2. The Current Study

At this point, I return to the questions posed at the beginning of this chapter: When advanced L2 learners become sensitive to the interaction between word order and verb type as evidenced in the previous chapter, where does this sensitivity come from?

Recall that they processed SVO word order more easily with action verbs than with psych verbs. Additionally, in the second spillover region, they processed OVS word order more easily with psych verbs than with action verbs. Both of these distributions follow the canonical word order/verb type associations in Spanish (Gattei et al. 2015). Based on the characterizations of the rigid nature of English in the L2 Spanish studies cited in the previous section, the most logical conclusion would be that the L2 learners could not have relied on L1 English instincts in order to inform nativelike processing behavior in L2 Spanish. Instead, this knowledge must have been acquired in L2 Spanish or have come from some universal linguistic source. The goal of this study is to empirically investigate L1 English speakers' sensitivity to word order/verb type interactions in order to address these issues. The goal is not to prove or disprove that language transfer occurs between the languages at the syntax-semantics interface. Instead, the goal is to conduct just one of the three assessments of language transfer, *crosslinguistic performance congruity*: "Evidence that a language user's behavior in one language really is motivated by her use (i.e., the way she demonstrates her knowledge) of another language" (Jarvis and Pavlenko 2008: 35). Based on this assessment, if English and Spanish operate in a similar way at the intersection of word order and verb type, then positive language transfer is conceivable. If they operate differently, however, then positive language transfer is not supported. The other two necessary measures for a complete analysis of language transfer—intragroup homogeneity and intergroup homogeneity (Jarvis and Pavlenko 2008)—will not be assessed in this study.

2.1 Departures from previous studies

In chapter 2, participants' sensitivity to word order/verb type interactions in Spanish was measured by their reactions to action verbs and Class III psych verbs in two different word orders in an SPR task. Before describing the comparable English experiment from this chapter, it is necessary to justify the existence of Class III psych verbs in English. Although L2 scholars have claimed that they do not exist in English (Montrul 1998) or do exist but are not part of English speakers' native linguistic system (Gómez Soler 2010), I argue that English has several productive class III psych verbs. In order to identify such verbs, we must first ask: (1) What is a psych verb?; (2) What is a Class III psych verb?; and (3) what is an experiencer? Psych verbs express a psychological event or state, and one of its arguments has the thematic role of experiencer (Landau 2010). An experiencer is an argument (either subject or object) of a psych verb that "undergo[es] a sensory, cognitive, or emotional experience" (Santorini and Kroch 2007). Landau (2010) distinguishes the three classes of psych verbs in English following Belletti and Rizzi's tripartite categorization, as seen in (2).

(2) a. Class I: Nominative experiencer, accusative theme.

John **loves** Mary

b. Class II: Nominative theme, accusative experiencer.

The show **amused** Bill.

c. Class III: Nominative theme, dative experiencer.

The idea **appealed** to Julie.

This distribution in (2) can be compared to the one shown for Spanish in (1). In both languages, the different classes respectively contain arguments with the same case and

thematic relations. Additionally, the aspectual distinctions between the classes are the same: Class I and III verbs are stative, but Class II verbs can be either eventive or stative, depending on the specific verb and context. Piecing together these different aspects, a Class III psych verb can be characterized in the following way: it is a stative psych verb with a dative object experiencer that undergoes a sensory, cognitive, or emotional experience (Santorini and Kroch 2007). Based on this description, I posit that there are several Class III psych verbs in English, such as *to sound*, *to look, to seem, to matter, to mean, to smell, to taste, to appeal*. Some of these verbs are shown in context in the sentences in (3); the nature of the experience that the dative object is undergoing is noted in parentheses.

(3) a. Does this food **taste** stale to you? (sensory)

b. Sure- **sounds** good to me. (cognitive/sensory)

c. Her behavior **seems** strange to me. (cognitive)

d. I don't think your leg is broken; it **looks** fine to me. (sensory/cognitive)

e. I know that you like blue cheese, but to me it **smells** terrible. (sensory)

f. You **matter** to me. (emotional)

g. Richard **means** so much to me. (emotional)

In all of the sentences in (3), the verbs are stative and there is a person being affected by a sensory, cognitive, or emotional experience (Santorini and Kroch 2007). Additionally, the affected person is the dative object of the verb, and the other argument is the Theme (or Stimulus). The core requirements for being a class III psych verb are met (Landau 2010).

Now that the existence of Class III psych verbs in English has been established, it is possible to create a task that is similar to the one that explored the sensitivity to the

interaction between word order and verb type in Spanish in Chapter 2. To allow for an appropriate comparison to the results from the Spanish experiment, only sentences with dative objects will be analyzed. While every effort was made to make the English task as similar as possible to the Spanish task for a fair comparison, some modifications had to be made. These changes to the English task were warranted because English and Spanish differ with regard to the naturalness of specific object-initial word orders. Unlike in Spanish, the OVS word order is not used often in English[6]. The most natural object-initial word order is OSV (Namboodiripad 2017): "To me, John seems like a nice person." Therefore, instead of contrasting SVO with OVS, SVO will be contrasted with OSV in the English task. One may question whether OVS in Spanish and OSV in English can be compared because the constituent orders are not identical. Nevertheless, they are both object-initial, and scholars have found that object-initial sentences consistently pattern differently than subject-initial sentences when verb type is an experimental factor (Bornkessel and Schlesewsky 2006; Gattei et al. 2015, 2017). For example, Bornkessel et al. (2003) explain that subject-initial sentences are generally preferred over object-initial sentences crosslinguistically, but this tendency is neutralized or reversed in sentences with Class III psych verbs. This is true for both German and Spanish, even if the specific object-initial constituent order is different (e.g., OSV, OVS). Therefore, since the current English study is also based on word order/verb type interactions, OSV can serve as a contrastive word order to SVO since one is object initial and the other is subject-initial. Based on crosslinguistic findings, if English speakers were to associate a particular verb

[6] It is not impossible, however, in constructions with a fronted object NP (meadow) inside a PP; e.g., "In the meadow grew many types of flowers."

class with object-initial sentences, the verb class would be predicted to be Class III psych verbs (e.g., Bornkessel and Schlesewsky 2006).

Although English has been described by L2 Spanish researchers as a strict SVO language that only maps thematic roles in this order (Pascual y Cabo 2013; Tight 2012), crosslinguistic experimental findings (e.g., Bornkessel and Schlesewsky 2006) and the identification of class III English psych verbs motivate the need for a more thorough examination of the interaction between word order and verb type in English. This examination will provide the data needed for an assessment of crosslinguistic performance congruity (Jarvis and Pavlenko 2008) between English and Spanish, which will enhance the theoretical discussion related to potential language transfer between these languages.

The specific research questions for this study are:

1. Are L1 English speakers sensitive to the interaction between word order and verb class in their offline language use?

2. Are L1 English speakers sensitive to the interaction between word order and verb class during online sentence processing?

2.2 Task 1: Sentence completion preference task

A sentence completion task was designed to examine English speakers' offline associations between word order and verb type. Specifically, the goal was to determine if English speakers gravitate towards using different classes of verbs based on whether the sentence has an SVO or OSV word order. The results from this task will answer research question 1.

2.2.1 Method

2.2.1.1 Participants

Twenty-three native English speakers completed this task. They were all students at a mid-sized public university and had no significant exposure to second languages before the age of 12.

2.2.1.2 Materials

The sentence completion task consisted of 12 items. There were four target sentences and eight fillers. The critical manipulation in the target sentences was word order: either SVO or OSV. Target sentences included a PP "to me," which signaled that it was a dative object. This dative object was either placed at the beginning of the sentence, which signaled an OSV word order, or in the middle of the sentence, which signaled an SVO word order. Two target items are shown in (4)[7].

(4) a. **SVO**: Steve _____ to me _____.

b. **OSV**: To me, Andrew _____.

2.2.1.3 Methodology

The sentence completion task was completed at the participants' own pace using the survey software Qualtrics. Sentences appeared one at a time along with a word bank, which was identical for all target sentences. The scattered word bank included eight psych verbs and eight action verbs. The verbs that were included in the task are shown in (5).

[7] The other two target items were identical in structure, but *Steve* and *Andrew* were changed to *Jenny* and *Ashley*.

(5) **psych**: mattered, seemed, appeared, smelled, looked, felt, meant, sounded

action: waved, ran, whispered, called, replied, talked, spoke, sang

Participants were instructed to complete the sentences however they wished, with the only requirement being that they use one of 16 the verbs from the list in each sentence. If there were two blanks in a sentence, the verb was to be used in the first blank. The second blank in the SVO sentences was not completely necessary, but it was provided in case participants wished to add additional embellishments to their sentences in order to make them more contextualized and natural-sounding. The filler items contained various sentence structures and did not contain the verbs seen in (5). All items were presented in a randomized order.

2.2.2 Results

The sentence completion task returned a total of 85 verb tokens: 43 from OSV sentences and 42 from SVO sentences. One token from an SVO sentence was discarded because the participant did not use a verb from the verb bank. Of the 42 verb tokens from SVO sentences, 32 were action verbs (76%). The three most commonly used verbs were *whispered*, *sang*, and *waved*. Of the 43 verb tokens from OSV sentences, 31 were psych verbs (72%). The three most commonly chosen verbs were *smelled*, *seemed*, and *looked*. Sample responses that show the two most common word order/verb type patterns are shown in (6) and (7). The underlined portion of the sentences represents what was added by participants.

(6) a. Steve **whispered** to me softly. (SVO/action)

b. Ashley **waved** to me and said goodbye. (SVO/action)

(7) a. To me, Andrew **smelled** like three-week-old cheese. (OSV/psych)

b. To me, Jenny **seemed** very kind. (OSV/psych)

A logit mixed effects was constructed in order to determine whether verb selection (psych vs. action) was motivated by word order. The results revealed that word order was a reliable predictor of the type of verb that would be selected ($\beta = -2.11$, SE = 0.5, $z = -4.25$, $p < .001$). If a sentence had an SVO structure, participants were more likely to complete it with an action verb. If a sentence had an OSV structure, participants were more likely to complete it with a psych verb. Therefore, the results answer research question 1 in the affirmative: L1 English speakers are sensitive to the interaction between word order and verb class in their offline language use.

2.2.3 Discussion of Task 1

The findings suggest that the combinations SVO/action and OSV/psych are more natural to English speakers than SVO/psych and OSV/action. This distribution can be explained with the modified functionalist version of Belletti and Rizzi's (1998) thematic hierarchy that was explained in more detail in Chapter 2. This hierarchy is repeated in (8).

(8) Agent > Experiencer … > Theme|Recipient

When provided with object-initial or subject-initial sentence frames, English speakers are guided by the intuition that syntactically prominent arguments have high thematic prominence (e.g., Belletti and Rizzi 1988). In an SVO sentence frame such as the one in (4a), the sentence-initial NP *Steve* is in a highly prominent syntactic position (Givón 1984), so the default assumption is that it has the most prominent compatible thematic role: Agent. Since only action verbs can have an agentive subject, participants are drawn

toward completing the sentence with an action verb in order to construct a sentence with a canonical syntactic-semantic alignment.

In an OSV sentence frame such as the one in (4b), the tendency is reversed. When participants see a sentence-initial dative object "To me", they consider it to be highly prominent because it is syntactically "compet[ing] with the subject for the focus of attention", which "reflects the higher topicality of the non-subject" (Givón 1984: 757). Because of this high syntactic and discursive prominence, participants tend to assign this dative object the most prominent compatible thematic role from (8): Experiencer. Once "To me" is assumed to be a dative object experiencer, participants are more prone to select a Class III psych verb since only this class of verb has dative object experiencers.

The findings from this task can be summarized in the same way that Ferreira (2004) described English speakers' tendency to align syntax with semantics when formulating active and passive sentences: "It appears that sentences tend to be organized so that more thematically prominent entities occur in more syntactically prominent positions" (728). Finally, it is important to mention that the pattern observed in this task coincides with the results from a sentence completion task in Spanish (Gattei et al. 2017). Gattei et al. (2017) found that Spanish speakers prefer to complete subject-initial sentences with action verbs, and object-initial sentences with psych verbs. This indicates that there is crosslinguistic performance congruity (Jarvis and Pavlenko 2008) between English and Spanish speakers at the intersection of word order and verb type based on their offline language production, which means that positive language transfer between the two languages is conceivable in this domain.

2.4 Task 2: English self-paced reading

Task 1 revealed that native English speakers generally associate subject-initial and object-initial sentences with different classes of verbs. Nevertheless, since it was an offline task, it cannot be appropriately compared to the online Spanish reading task from Chapter 2. For this reason, Task 2 is a SPR experiment that assesses English speakers' real-time sensitivity to word order/verb type interactions in English. The results from Task 2 will answer research question 2.

2.4.1 Method

2.4.1.1 Participants

Twenty-three English speakers from a large public university were recruited. They self-identified as native monolingual English speakers. These participants were not the same as those from Task 1.

2.4.1.2 Materials

In the SPR task, the two independent variables were word order and verb type, each having two levels. This resulted in a 2 x 2 design with four conditions: SVO/Action verb, SVO/Psych verb, OSV/Action verb, OSV/Psych verb. In contrast to the Spanish SPR task from chapter 2, the sentences in the current English task were not divided into segments. This change in methodology was motivated by the fact that all the participants in the English task were native speakers, and it was estimated that they would not need the accommodation of segmentation. Therefore, each word in the sentences in the current task represents its own region. An example of each condition is shown in Table 3.1.

Table 3.1. Sample item from English self-paced reading task

Condition	Example
SVO/Action	Kelly talked sincerely and openly to Marie at the Alcoholics Anonymous meeting over the weekend
SVO/Psych	Kelly looked pale and malnourished to Marie at the Alcoholics Anonymous meeting over the weekend
OSV/Action	To Marie, Kelly talked sincerely and openly at the Alcoholics Anonymous meeting over the weekend
OSV/Psych	To Marie, Kelly looked pale and malnourished at the Alcoholics Anonymous meeting over the weekend

To ensure that learners were reacting to the linguistic conditions and not the specific names *Kelly*/*Marie* or verbs *talked*/*looked*, a total of 32 different items were created. The pairs of names were unique between items, and traditional male names and traditional female names were not mixed within items so that subconscious gender dynamics between men and women would not influence the interpretation of sentences. It is important to note that each verb was repeated twice due to the fact there is a limited number of common verbs that take dative objects in English. Therefore, eight Class III psych verbs and eight action verbs were used, with one repetition of each verb in two different items. Nevertheless, because of the experimental design explained below, no participant saw the same verb in the same condition more than once.

The 32 items consisting of four conditions were distributed across four lists using a Latin Square design. This ensured that only one of every four participants would read exactly the same target sentences. To distract participants from the focus of the task, it was combined with an unrelated SPR task consisting of 32 items. The focus of this

unrelated task was the interaction between sentence plausibility and the distance between dependencies in sentences. Two sentences from this distractor task are shown in (9) and (10).

(9) Six months ago, the accomplished weightlifter broke a record at the gym in the city.

(10) The accomplished weightlifter broke a record, six months ago, at the hospital in the city.

Thirty-six additional fillers were added to the task to disguise to true purpose of experimental items. In total, the SPR task contained 100 sentences. As a final measure of experimental validity, the target sentences, fillers, and distractors were also randomized for each participant in order to ensure that any effect caused by a certain condition was not a result of the order in which sentences were presented. Both the Latin Square distribution and randomization were completed with the software Linger (Rohde 2001).

In order to encourage participants to remain focused during the experiment, a comprehension question appeared after all sentences. For example, the comprehension question that followed the sentences from the item in Table 3.1 is shown in (11).

(11) Was it an Alcoholics Anonymous meeting that the two people attended?

Yes No

This correct answer to this particular comprehension question was 'yes'. Half of the comprehension questions required a 'true' response and the other half required a 'false' response. A complete set of stimuli and comprehension questions for this task is provided in Appendix B.

2.4.1.3 Methodology

The psycholinguistic methodology known as SPR was used to record participants' reading times as they comprehended each sentence word by word. This methodology allows for a precise analysis of comparative processing difficult between conditions at critical regions. The SPR software used was Linger (Rohde 2001). If speakers are sensitive to the interaction between word order and verb type based on the preferences they showed in Task 1 (SVO/action and OSV/psych are more natural than SVO/psych and OSV/action), they would have enough information to react to this interaction upon reading the verbal region. For example, since English speakers maintain a strong association between SVO word order and action verbs, they might not expect to find a psych verb in SVO sentences. Therefore, the appearance of a psych verb in SVO conditions is predicted to cause a processing delay. In OSV sentences, the opposite is predicted: the appearance of an action verb will not be expected by participants, which might cause a processing delay. The verbal region will be the focus of the analysis since this is where speakers can react to expected or unexpected word order/verb type combinations. In self-paced reading, the effect from the target region is commonly observed in the following region or the follow two regions; this is known as the "spill-over effect" (Keating and Jegerski 2015). Consequently, the first post-verbal region will also be analyzed.

2.4.1.4 Procedure

Participants first read an overview of the study and signed a permission form. Participants were paid 10 US dollars for a 40–60 minute session. They were given the opportunity to ask for any clarifications before beginning. The SPR task was presented on

a 15.4" MacBook Pro laptop computer using the software Linger (Rohde 2001). All sentences were masked and presented in size 24 font with a moving window display. This means that each sentence was presented as a series of dashes (e.g., ----------), and the participants used the space bar to reveal each word in the sentence in isolation, from left to right. After reading the last word in a sentence, a comprehension prompt appeared on the screen. The comprehension prompt was related to some non-target aspect of the sentence (i.e., the comprehension question did not draw participants' attention to either word order or verb type manipulations). Participants pressed "F" for *yes* or "J" for *no*. Feedback on the correctness of responses was not provided. In order to familiarize themselves with the format of the experiment, participants completed five practice sentences prior to beginning. These practice sentences were also followed by comprehension questions. The participants then completed the SPR task consisting of 100 sentences (32 target sentences and 68 filler sentences). After the presentation of the 50th sentence, a message appeared on the screen and participants were given the opportunity to take a break in order to prevent reading fatigue.

2.4.1.5 Analysis

Reading time data (measured in milliseconds) was analyzed from the trials (i.e., sentences) in which the comprehension question was answered correctly. The comprehension rates for target trials was 93.9%, so this represents the percentage of target trials that were included in the analysis. To account for extreme data that did not appear to be representative of participants' group, residuals that deviated more than 3 standard deviations from the mean were not included in the analysis; this resulted in the removal of 1% of the data. A more aggressive data trimming measure was not taken since

there were only 23 participants with a potential 32 target data points for each. Also, recall that the incorrectly answered trials were previously removed from the analysis, so the exclusion of more tokens from a relatively small data pool might not have allowed for robust findings. Non-aggressive approaches to data trimming are also promoted by Baayen and Milin (2010) and Keating and Jegerski (2015), especially when preparing data for mixed models.

Because raw reading times often do not have a normal distribution of their residuals, reading times were log-transformed (Hofmeister and Vasishth 2014). Specifically, the log residual reading times were the measurement of analysis, following Hofmeister and Vasishth (2014). In addition, reading times were normalized using an R script developed by Jaeger (2008) in order to account for varying word length in segments (not all words in each region had the same character length), the effect of previous segments within a sentence, and the position of specific sentences within the list. These normalizations helped neutralize the effect that extraneous factors might play in the analysis. Then, using R, a mixed effects model was constructed with log residual reading times as the dependent variable and verb type and word order as fixed effects. Since it is possible that baseline reading times could vary between target sentences and participants, "item" and "subject" were added as random effects. The results of the experiment will be presented as estimates (β), standard errors, t-values, and p-values. Results that have a p-value lower than .05 will be considered significant, and those between .05 and .08 will be considered marginally significant.

2.4.2 Results

The results from the self-paced reading task are presented in Figure 3.1. Each word is its own region. SVO and OSV conditions have been separated into two separate plots since the PPs that represent the dative objects do not line up. For example, in Figure 3.1, the dative object "To Marie" is found at the beginning of OSV sentences (regions 1-2), but this dative object is found in a sentence internal position in SVO sentences (regions 8-9). By presenting the plots in this way, the critical verbal regions (the boxed regions 4-5) between SVO and OSV conditions can be visually compared more easily.

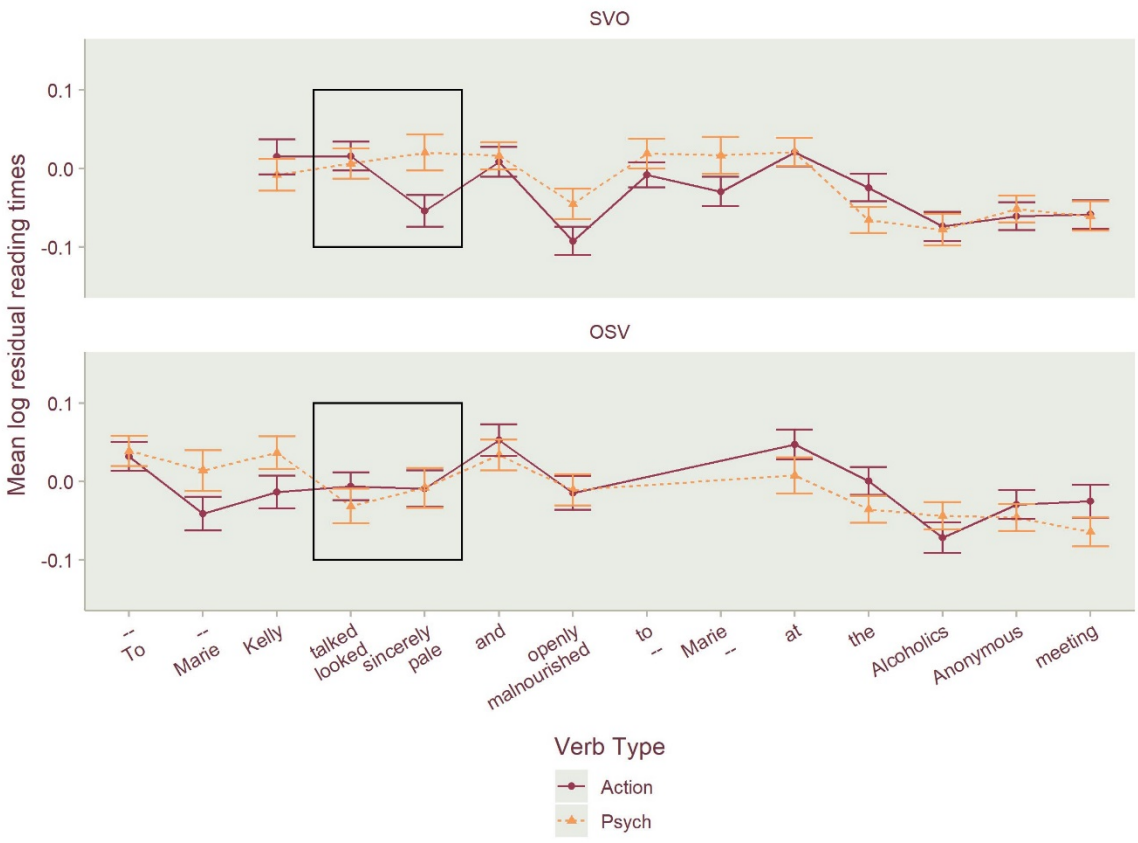


Figure 3.1. Mean log residual reading times in the English self-paced reading task. In the regions with stacked labels on the x-axis, the ones on top correspond to SVO conditions, and the ones on bottom correspond to OSV conditions.

At the critical verbal region (region 4; first boxed region), there were no significant effects of word order or verb type. In the first spillover region (region 5; second boxed region), however, there was a marginal interaction between word order and verb type (β = 0.02, SE = 0.01, t = 1.83, p = .07). A post-hoc Tukey test was performed to resolve this interaction. It revealed that in SVO sentences, action verbs were read more quickly than psych verbs (β = -0.07, SE = 0.03, t = -2.49, p = .01). This main effect of verb type in SVO conditions was also observed when participants attempted to incorporate a post-verbal dative object in regions 8-9. The dative object "to Marie" was read marginally faster in sentences with action verbs in comparison to psych verbs (β = -0.02, SE = 0.01, t = -1.92, p = .06). In OSV sentences, however, neither action verbs nor psych verbs offered a processing advantage in regions 4–5. For example, in region 4 (the critical verbal region), both action verbs and psych verbs were read with similar speed (β = 0.003, SE = 0.03, z = .11, p = .91). The results respond to research question 2 by affirming that L1 English speakers are marginally sensitive to the interaction between word order and verb type during sentence processing; the interaction is driven mostly by the disparity in reading times between the two SVO conditions.

2.4.3 Discussion of Task 2

As noted in the previous section, action verbs lead to a significant processing facilitation in comparison to psych verbs in SVO sentences. I interpret the difference between SVO/Action and SVO/Psych to be a result of the respective canonical and non-canonical alignments of arguments in these conditions. Like Spanish speakers (Gattei et al. 2015), when English speakers see a sentence-initial NP with no overt case marking, they assume it has nominative case and is the subject. Based on the high syntactic

prominence of this argument, they assume it also has significant thematic prominence (e.g., Belletti and Rizzi 1988), which leads them to predict that it is an agent per the thematic hierarchy in (8). At this point participants predict that an action verb will appear in the sentence since only action verbs are compatible with agentive subjects. But, if a psych verb appears instead, there is a processing delay. This effect in SVO conditions persists even at the post-verbal PP region that contains the second argument, a dative object (e.g., "to Marie"). The marginal delay in this region indicates that participants take longer to determine thematic relations even at the position of the second argument when thematic prominence is not preserved.

In OSV conditions, English speakers' verb type predictions were expected to be reversed. Based on thematic prominence, they were expected to interpret a sentence-initial dative object with the most prominent role that it can have according to the thematic hierarchy: an experiencer (Belletti and Rizzi 1988). This interpretation of the first argument would have led to the prediction that a Class III psych verb would appear, given that this is the only verb class that is compatible with dative object experiencers. It would follow that a psych verb would be easier to process than an action verb. Nevertheless, neither verb type led to significantly faster reading times in OSV conditions. This could mean that English speakers are not making real-time predictions regarding verb type when reading OSV sentences. However, this might not necessarily be the case, especially considering the strong connection that English speakers have between OSV word order and psych verbs, as evidenced in Task 1. A less clear result in OSV conditions could be due to a general processing distinction between subject-initial

sentences and object-initial sentences, regardless of verb type (Bornkessel and Schlesewsky 2006).

Bornkessel and Schlesewsky (2006) note that there is a crosslinguistic processing disadvantage for object-initial sentences in comparison to subject-initial sentences. Therefore, although the canonical OSV pattern, OSV/psych, has an ideal alignment of arguments, the fact that it is object-initial may induce a slight processing disadvantage that prevents it from being consistently distinguished from the non-canonical OSV/action condition. In languages that are predominantly subject-initial, such as German, Spanish, and English, an object-initial sentence signals something "special." Object-initial sentences are also associated closely with a special class of verbs in German, Spanish, and English, namely Class III psych verbs (Bornkessel and Schlesewksy 2006; Gattei et al. 2015; see Task 1 results for English evidence). Despite the offline connection between object-initial structures and psych verbs, Bornkessel and Schlesewksy (2006) discovered in a German ERP study that all object-initial structures caused a similar N400 response regardless of verb type, which indicated some processing difficulty; the canonical combination of an object-initial structure and a psych verb did cause a less pronounced N400 response, however. Additionally, in a Spanish ERP study, Gattei et al. (2015b) found that canonicity in object-initial sentences triggered a different cognitive mechanism than canonicity in subject-initial sentences. The non-canonical SVO condition (SVO/psych) caused a P600 effect, but the non-canonical OVS condition (OVS/action) caused an N400 effect. The results of these German and Spanish studies, in conjunction with the less consistent finding regarding canonicity in object-initial sentences in the current English study, suggest that the effect of canonicity might manifest differently in

subject-initial sentences than in object-initial sentences in sentence processing. More research will need to be conducted to better understand this discrepancy.

3. Discussion and conclusions

One of the main motivations for this study was to determine if English speakers could theoretically rely on any L1 knowledge related to word order/verb type associations when processing sentences in L2 Spanish. Evidence of similar knowledge and processing strategies between English and Spanish would provide evidence of crosslinguistic performance congruity and partially support the possibility of positive language transfer between the languages. Based on how English has been depicted in L2 studies as a strict SVO language (Pascual y Cabo 2013; Tight 2012) that does not have Class III psych verbs, the assumption would have been that English speakers and Spanish speakers do not have similar knowledge regarding the word order/verb type associations.

Countering this assumption, Tasks 1 and 2 reveal that native English speakers are guided by word order and verb type associations during offline production, and at least partially guided by these variables during sentence processing. In the offline production task, English speakers showed clear verb type preferences based on the word order of the sentence. In the SPR task, the interaction between word order and verb type was observed in subject-initial sentences, but not in object-initial sentences. The SPR findings are reminiscent of those from the Spanish SPR task in chapter 2: advanced L2 Spanish learners distinguished canonical and non-canonical word order/verb type patterns in subject initial sentences (SVO/action was read faster than SVO/psych), but not in object-

initial sentences (OVS/psych and OVS/action were read with similar speed)[8]. Native Spanish speakers exhibited the same pattern. The crosslinguistic parallel between English and Spanish sentence processing behavior in subject-initial and object-initial sentences is interpreted to reflect a degree of crosslinguistic performance congruity (Jarvis and Pavlenko 2008), which means that it is plausible (but does not confirm) that advanced L2 Spanish speakers rely on operative syntactic-semantic alignments from English when processing Spanish sentences. In other words, English speakers, like Spanish speakers, appear to come equipped with similar knowledge related to the interaction between word order and verb type, contrary to the assumptions of Gómez Soler (2015) and Pascual y Cabo (2013).

For the sake of argument, let us consider the possibility that advanced L2 Spanish learners from Chapter 2 did not *acquire* knowledge related to the canonical syntactic-semantic alignment of arguments in Spanish, but instead transferred this knowledge from their L1, English. If this were the case, why can they not employ this knowledge in Spanish until they reach advanced proficiency? As argued in Chapter 2, it could be the case the beginner and intermediate learners are not able to efficiently create a syntactic template, correctly identify the grammatical role of arguments, and map thematic prominence to arguments—all in real time. With such low proficiency, they rely exclusively on word order as the most important cue during sentence processing. They parse sentences with a subject-first strategy (VanPatten 2004), which causes them to hesitate when they encounter OVS sentences. It is not until they reach advanced

[8] The advanced L2 learners did read OVS/psych faster than OVS/action in the second spillover region, however.

proficiency that they fully complete phases 1 and 2 of sentence processing (Bornkessel and Schlesewsky 2006), which includes interpreting the case of a sentence-initial argument, mapping thematic roles to arguments, and making predictions about the type of verb that will appear. Since only one test of language transfer (crosslinguistic performance congruity; Jarvis and Pavlenko 2008) was completed in this study, it is only possible to conclude that positive language transfer at the intersection of syntax-semantics is *conceivable* between Spanish and English. Future research will be needed for a more complete analysis. Still, even the prospect that such knowledge could be transferred between English and Spanish is a significant departure from many traditional assumptions about English in L2 Spanish studies.

The results of this study suggest that English should be described with more nuance in L2 Spanish studies, and that crosslinguistic similarities should be explored between languages even if they appear to be superficially very different. While English is predominantly an SVO language (Namboodiripad 2017), it is not completely accurate to claim that "English adheres strictly to an SVO word order" (Tight 2012: 352) or that "English does not have flexible word order" (Gómez Soler 2015). Recent work has begun to question what it means for a language to have a "rigid" or "flexible" word order. Namboodiripad (2017) advocates for the examination of word order flexibility (or what she calls "constituent order" flexibility) as a gradient property of languages, not a binary one. Givón (1984) also considers word order flexibility to be gradient. For example, English may be less flexible than Spanish, but Spanish is also less flexible than Czech. Using acceptability judgments, Namboodiripad found that while SVO is the canonical word order in English, the non-canonical OSV word order falls within the range of

grammaticality. Bates and MacWhinney (1982) also discovered that English speakers consistently interpret NNV sequences as OSV, which shows that English speakers do have linguistic intuitions regarding non-SVO structures. One might question whether the non-canonical English order OSV can be compared to OVS in Spanish since they are not identical. However, regardless of the specific constituent order, subject-initial orders often pattern differently than object-initial orders—particularly when psych verbs are involved (Schlesewsky and Bornkessel 2004). Therefore, when examining the L2 acquisition of object-initial sentences, it may be relevant to examine the participants' behavior with object-initial sentences in their L1, even if the constructions are not identical between the languages (e.g., OSV vs. OVS).

Finally, this study challenges current assumptions in L2 Spanish studies regarding English psych verbs. Although scholars have claimed that Class III verbs do not exist or that English speakers do not use them natively (Montrul 1998; Gómez Soler 2010), there appear to be several common English verbs that have the essential properties of Class III psych verbs. They are stative and take a dative object experiencer and a theme as arguments. In Landau's (2010) seminal work on psych verbs and experiencers, he also describes English as having three classes of psych verbs. It is not sufficient to simply document these verbs' existence, however. This study has shown that English speakers understand that Class III psych verbs and action verbs do not interact with word order in the same way. Specifically, as shown with Task 1, subject-initial word orders are associated more with action verbs, and object-initial word orders are associated more with psych verbs. This is a crosslinguistic pattern that is observed in many languages, including Spanish (Gattei et al. 2017) and German (Schlesewsky and Bornkessel 2004).

When exploring the L1 influence of English in future L2 studies related to word order or verb type, scholars should consider that Class III psych verbs do exist in English and that English speakers are familiar with at least one object-initial word order, namely OSV (Bates and MacWhinney 1982; Namboodiripad 2017).

Chapter 4: The Effect of Word Order and Verb Type on Subject Identification

1. Background

It is well known that beginning and intermediate L2 learners can struggle with word order variations in a second language (e.g., Malovrh and Lee 2013). While the L2 processing of Spanish psych verbs has not been studied with online tasks, the processing of non-psych verbs and varying word orders has been a central focus for the past several decades in both L1 and L2 research. Bever (1970), for example, suggests that sentences are initially parsed according to a "rough and dirty" noun-verb-noun (NVN) template in which the first noun is the actor and the second noun is the patient. This parsing strategy is supported by the fact that L1 English-speaking young children tend to incorrectly interpret passive sentences as actives. Fraser and Brown (1963: 133) explain that for 3-year olds, "'The girl is pushed by the boy' is not computed as Object-Verb in the passive, but rather as Subject-Verb in the active." They further explain that "[p]rocessing the sentence in this way would enable [a subject] to maintain the generality of the usual rule of English word order in which the subject precedes the object" (133). Slobin (1973) essentially comes to the same conclusion, which he captured with his Operating Principle C: "Sentences deviating from standard word order will be interpreted at early stages of development as if they were examples of standard word order" (198). Slobin's (1973) principle and Bever's (1970) NVN parsing template are known as "heuristics" that guide comprehenders when processing sentences, and they have gained significant support from adult L1 research as well. Ferreira (2003), for instance, reveals that even adults comprehend sentences more accurately and quickly when they are active sentences as

opposed to passives. Such results led her to include Bever's (1970) NVN = Actor-action-Patient heuristic as a major component of her "good enough" sentence processing model (Ferreira 2003).

Although Spanish generally has a more flexible word order than English, the standard word order in Spanish is still SVO (Dryer 2013), which means that Slobin's (1975) Operating Principle C is also relevant for L1 Spanish speakers. Using the raw data from Echeverría (1978), González (1997) revealed that L1 Spanish speakers between the ages of 5-10 interpret SVO sentences correctly 98.1% of the time, but they only correctly interpret the arguments in OVS sentences 67.7% of the time. This is the same pattern that González found for L2 Spanish learners, which led her to conclude that both L1 and L2 Spanish learners have the same acquisitional stages with regard to word order:

(1) I. SVO II. SOV III. OSV IV. OVS

(González 1997)

González's (1997) finding concerning the late-acquired status of OVS word order among L2 learners of Spanish has been shown in many other studies. VanPatten (1984) demonstrated this in an aural comprehension task that included SVO and OVS word orders. The participants, who were first and second-semester L2 learners of Spanish, incorrectly interpreted the object to be the subject in 35% to 70% of OVS sentences. As a result of such findings, VanPatten (1996) included the First Noun Principle in his theory of Input Processing, which is similar to Bever's (1970) claim that L1 learners rely on an Actor-Action-Object template for initial parsing: "Learners tend to process the first noun or pronoun they encounter in a sentence as the subject (or agent)" (VanPatten 1996: 122). Tight (2012) showed additional evidence for the First Noun Principle with an aural

comprehension task that included sentences with SVO, VSO, and VOS word orders. In his study, L2 learners heard a sentence and were asked to identify who was doing the action in the sentence (i.e., the subject) within eight seconds. He found that for first-, third-, and fifth- semester learners of Spanish, SVO sentences were the easiest to comprehend. First and third-semester learners had more difficulty identifying the subject with VOS and VSO sentences since the word order did not match the canonical NVN pattern (Bever 1970; VanPatten 1996). Third and fifth-semester learners did not perform significantly differently between VSO and VOS; they only seemed to distinguish canonical word order (SVO) from non-canonical word order (VSO/VOS). First year learners, however, incorrectly interpreted VOS significantly more often than VSO. This extra difficulty with VOS order would be predicted according to the First Noun Principle (VanPatten 1996), given that the object precedes the subject.

As further corroboration of English speakers' difficulty with processing non-SVO word orders in an L2, LoCoco (1987) reported that learners of Spanish only interpreted 46% of OVS sentences correctly in an aural comprehension task. Interestingly, however, the task type had a significant effect on comprehension. When these same learners were simultaneously presented with the aural and written production of sentences, OVS order was correctly interpreted up to 65% of the time. Houston (1997) showed that context also plays a role in lessening the effect of the First Noun Principle (VanPatten 2004). His fourth-semester college student participants had all been instructed using the video series *Destinos*. In his aural comprehension task, half of the target OVS sentences reflected events in the video series with the accurate names of the characters. In the other half of the target OVS sentences, the names of the characters were swapped with names that

students were unfamiliar with. The results showed that L2 learners interpreted the subject in OVS sentences 20% more accurately when they could rely on background knowledge of *Destinos* character names and events (72% accuracy) as opposed to when the names were random (52% accuracy). LoCoco (1987) and Houston (1997) both revealed that while the FNP is clearly active in L2 learners' sentence comprehension, there are additional factors that can attenuate or override this parsing tendency. Therefore, the FNP should be understood as a default influence for L2 learners when discourse, pragmatics, background information, and other relevant cues do not provide disambiguating information as to who is doing what to whom in a sentence (VanPatten 2007). That is, in a sentence without context, learners resort to the FNP until they have built up a grammar and the ability to process with that grammar.

The studies mentioned above point to a predominant trend for L2 learners of Spanish whose L1 is English: SVO word order is more easily and accurately comprehended than non-SVO word order. While some researchers rely on a universal processing tendency like the First Noun Principle (FNP) to explain L2 learners' interpretation of non-SVO sentences (VanPatten 1996), others allude to or make explicit claims about negative language transfer from English to explain the phenomenon. For example, Tight (2012: 362) suggests that "a powerful SVO prototype in the mind of English speakers" may cause third- and fifth-semester learners to plateau with regard to their non-SVO sentence comprehension. The claim of negative language transfer is also common in the literature on the L2 acquisition of Spanish psych verbs, with several authors alluding to the canonical SVO word order of English as one of the causes for the L2 Spanish learners' non-targetlike interpretation of OVS sentences (Gómez Soler 2014;

Toribio and Nye 2006). While negative language transfer could be a factor, more research is needed to corroborate this claim since SVO processing is a common tendency for both L1 and L2 learners of languages like English and Spanish (Bever 1970; Echeverría 1978; Slobin 1973; VanPatten 1996). Recall that the native Spanish-speaking children in Echeverría (1978) comprehended SVO sentences with over 30% more accuracy than OVS sentences (González 1997), and that native English-speaking children and adults confuse subjects and objects more in passive sentences (Bever 1970; Ferreira 2003). Typologically, English and Spanish are part of the same group of languages that have SVO as a dominant word order, and are part of the majority of languages that have a dominant word order that is subject-initial (Dryer 2013). Only 1% of the world's languages have a dominant word order that is object initial (e.g., OSV, OVS; Dryer 2013). Therefore, a subject-initial parsing strategy in an L1 or L2 could be driven by a fairly universal pattern in languages in which speakers expect subjects to precede objects. In L2 Spanish studies, potential universal parsing strategies and natural acquisitional stages must be considered in addition to negative language transfer from English.

The potential universality of the First Noun Principle and the fact that SVO is the default word for L1 and L2 learners of Spanish and English makes it particularly difficult to provide evidence of "intergroup heterogeneity," which is one of the three types of evidence that is necessary for a strong claim of language transfer (Jarvis 2008). Intergroup heterogeneity can be shown by providing "evidence that the behavior in question is not something that all language users do regardless of the combinations of L1s and L2s they know" (Jarvis and Pavlenko 2008: 35). Even Spanish speakers, who speak a language with more syntactic flexibility than English, have been shown to favor SVO

parsing when presented with a context that is ambiguous between an SVO and OSV interpretation in L2 Basque (Erdocia et al. 2014). Therefore, while Spanish speakers are perfectly capable of parsing non-SVO sentences in their L1, they still have a bias towards SVO parsing when in doubt in an L2. The intergroup heterogeneity principle (Jarvis and Pavlenko 2008) is meant to distinguish universal linguistic tendencies from tendencies that can truly be considered a result of L1 transfer, and these two have not been adequately teased apart in L2 Spanish studies on psych verbs.

In addition to the First Noun Principle, VanPatten (2007) offered the L1 Transfer Principle as an alternative, which he argued against. The L2 Transfer Principle holds that "L2 learners begin acquisition with L1 parsing procedures" (122). One of the only studies that has attempted to tease apart the effects of the First Noun Principle from L1 Transfer Principle (VanPatten 2007) was conducted by Isabelli (2008). She compared how accurately L1 English and L1 Italian speakers could identify the grammatical subject in Spanish SVO, OVS (*La escucha el chico* 'The boy listens to her'), and OOVS (A la chica la escucha el chico 'The boy listens to the girl') sentences during an aural comprehension task. All of the objects were either pronouns (in OVS conditions) or an object of a preposition followed by a pronoun (in OOVS conditions). If the L1 Transfer Principle were operational, Isabelli (2008) assumed that L1 English speakers "would have difficulty with Spanish OVS structures since this structure is not allowed in English, and therefore the English parser will have problems" (469). On the other hand, she assumed that "the Italian parser has mechanisms for computing OVS structure" (469), and predicted that L1 Italian speakers would not have difficulty with OVS sentences in their L2, Spanish. The results revealed that L1 Italian speakers were much better than L1

English speakers at identifying the correct subject of sentences in OVS and OOVS conditions. Isabelli (2008) interpreted this as evidence that L2 speakers' argument interpretation in non-SVO sentences is influenced by their L1 parsing abilities in non-SVO sentences, which supports the L1 Transfer Principle.

Nevertheless, VanPatten (2015) points out that it is not clear what was being transferred in Isabelli (2008), because L1 Italian speakers could have been relying on both syntactic and lexical cues based on L1 knowledge. The preverbal Spanish object pronouns used in the study, *lo* and *la*, are identical in Italian, and they have inherent accusative case. This makes them incompatible with a subject interpretation, regardless of their syntactic position. Consequently, upon seeing a sentence-initial object pronoun *lo* or *la*, both Italian and Spanish speakers know that this argument cannot be the subject due to its case, and in a context with only two referents, the other argument must be the subject by process of elimination. Therefore, the difference in subject identification accuracy between the L1 Italian and L1 English group could be the result of the Italian speakers relying on a combination of cues, not all of them syntactic. We need further research to test the hypothesis that L1 English speakers tend to misinterpret non-SVO Spanish sentences because the English parser has difficulty parsing object-initial sentences (Isabelli 2008).

Further complicating an assessment of L1 English influence in L2 Spanish studies of word order, Gattei et al. (2017) showed that adult native Spanish speakers do not identify subject arguments with equal accuracy between all SVO and OVS conditions in experimental tasks. In SVO conditions, for example, they more quickly and accurately identify subject arguments when the sentence contains an action verb as opposed to a

psych verb. This was interpreted as a reflection of the fact that the SVO/Action verb combination is canonical in Spanish, which makes it easier to process. Therefore, even though Spanish allows for different word orders and native speakers generally comprehend any of these word orders with similar accuracy in offline tasks (Kail 1989), the results from Gattei et al. (2017) indicate that we should not assume that native speakers will perform with the same accuracy during online tasks. Additionally, Dąbrowska (2002) and Street (2017) demonstrate that there can be significant individual differences between native speakers' linguistic systems, which is another important fact to consider when defining nativelike behavior. One factor that appears to be strongly related to variable native speaker performance in online tasks is level of educational attainment, which leads Street (2017) to challenge the widespread assumption that "first language acquisition is uniformly successful, with all learners converging rapidly on the same grammar" (193).

The findings from Gattei et al. (2017) and studies that show variation in native speaker processing (e.g., Street 2017) point to a weakness in L2 studies related to Spanish word order. Currently, it is common for L2 researchers to assume that native Spanish speakers will perform a certain way in comprehension tasks without collecting data from them. For example, Malovrh and Lee (2009) conducted an aural argument interpretation experiment in which L2 Spanish participants had to identify to the correct subject in SVO and OVS sentences. Without testing native speakers' performance on this task, the authors assumed that if L2 learners were able to correctly identify subjects in OVS sentences, it would indicate "correct, nativelike processing" (110). However, in online processing tasks, it is not always safe to conflate "native-like" processing with "correct"

processing, because unexamined combinations of linguistic factors (e.g., word order x verb type) could affect sentence comprehension in previously unreported ways (Gattei et al. 2017).

1.1 Unanswered questions in L2 Spanish word order studies

Decades of research has confirmed that L2 learners—especially those whose L1 is English—tend to interpret NVN strings with an SVO bias (VanPatten 2004), which can result in inaccurate interpretations in languages with variable word order, such as Spanish. Still, there are gaps in what we know about this First Noun parsing strategy (VanPatten 1996). Malovrh and Lee (2013) explain that "there is a lack of longitudinal or cross-sectional data that would trace learners' development" and that "the majority of work has focused on accusative case clitics, with only one work combining accusative and dative case clitics" (107). Malovrh and Lee (2013) began to address some of these issues by examining the interpretation of OVS sequences with dative clitics and with more advanced speakers. Nevertheless, the dative conditions were not separated by verb class, a factor that has since been shown to affect native Spanish speakers' argument interpretation (Gattei et al. 2015, 2017). Furthermore, while Malovrh and Lee (2013) included advanced Spanish teacher candidates in their study, the performance of L2 learners with even higher L2 proficiency, such as those with an MA or PhD in Spanish, is still not well documented. Moreover, they did not include a native Spanish speaker control group in their study in order to support their assumptions related to nativelike subject interpretation in a real-time task.

In addition to the lack of developmental data regarding learners' ability to interpret variable word orders and their understanding of dative case, we still do not

adequately understand the role of L1 English in L2 Spanish processing and its implications for the L1 Transfer Principle. In a discussion of the theoretical implications of the L1 Transfer Principle, VanPatten (2015: 120) echoes Isabelli's (2008) hypothesis that English speakers might struggle with OVS word orders because English has "no parsing mechanism to handle non-SVO structures (except for cleft sentences such as *Him I hate*)." Therefore, both scholars agree that if the L1 Transfer Principle is operational, L2 processing might be constrained by parsing strategies used in the L1. Based on this hypothesis, if L1 English speakers' poor performance in subject identification tasks with non-SVO structures in L2 Spanish is due to an inflexible or deficient L1 English parser, we would expect these same speakers to also perform poorly in similar tasks with non-SVO structures in their L1 English.

Alternatively, if English speakers can correctly identify arguments in various word orders in their L1, then the lack of their ability to do so in L2 Spanish might only reflect a failure to recognize and process the relevant L2 cues instead of reflecting the L1 English parser's ability to interpret non SVO-word orders. Such a result could be explained with a tenet of the Competition Model: "Learners will attempt to cue transfer whenever they can perceive crosslanguage similarity in the mapping between an L1 structure and L2 structure" (Morett and Macwhinney 2013: 134). Consequently, a non-nativelike performance in an L2 does not necessarily imply that the relevant linguistic knowledge is not available or expressed in an L1; learners may simply not perceive the similarity between crosslinguistic cues or these cues may have different weights in the respective languages.

Scholars have identified other sources of possible L1 English influence that could negatively affect the L2 acquisition of psych verbs that have a dative object experiencer argument, such as *gustar*. Montrul (1998) hypothesizes that "L1 influence plays a role with the accessibility of functional categories and the derivations involved in case checking" (54), and consequently, "English learners would experience greater difficulty with dative case because there is no dative case in English" (27). Kanwit and Lubbers Quesada (2017) also suggest that there are fundamental differences with regard to dative marking in Spanish and English. They explain that

> "[S]tarting a sentence with "A Juan" primes the native speaker for a psych verb construction; the *a* is critically important for marking the dative and is salient for a variety of reasons…English does not have such a marker for these constructions, and thus more attention is paid to constituent order, likely shifting learners' focus away from the lack of *a* and toward constituent order." (30)

From Montrul (1998) and Kanwit and Lubbers Quesada's (2017) perspective, L1 English speakers' grammar does not provide them with knowledge related to dative case or dative marking on psych verbs. Consequently, they struggle with Spanish verbs that make use of this case. To summarize, scholars' hypotheses related to L1 English influence as applied to the context of this study are the following: L2 Spanish learners' non-nativelike understanding of non-SVO word orders could be due to a less flexible parser in their native English (Isabelli 2008; VanPatten 2015) or to an unfamiliarity with dative marking due to its absence in their native English (Kanwit and Lubbers Quesada 2017; Montrul 1998).

2. The Current Study

The current study is divided into two experiments. The first experiment will investigate the ability of L2 Spanish learners of differing proficiencies to identify

grammatical subjects in sentences with different word orders (SVO vs. OVS) and verb types (action vs. psych). In Experiment 2, a group of beginner L2 Spanish learners will complete a comparable subject identification task in both their L2 and L1 (English). This experiment will constitute an assessment of crosslinguistic performance congruity (Jarvis and Pavlenko 2008), which will lead to a better understanding of the role L1 English may have on L2 Spanish when it comes to identifying grammatical subjects in similar sentences. I will use the following research questions as a guide:

1. Is the ability to correctly identify sentential subjects by L2 learners of Spanish at differing proficiency levels (i.e., beginning, intermediate, advanced) affected by word order (i.e., SVO/OVS) and verb type (i.e., action/psych) in sentences with dative objects? Specifically, do learners show differences in accuracy on the following types of sentences?
    a. SVO/ Action verb
    b. OVS/Action verb
    c. OVS/psych verb
    d. SVO/psych verb
2. Do word order and verb type affect L2 learners' response times when correctly identifying subjects?
3. Within the same group of learners, do word order and verb type affect subject identification accuracy in L1 English and L2 Spanish in a similar way in sentences with dative objects?

2.1 Experiment 1: Subject interpretation task (L2 learners and Native Spanish speakers)

2.1.1 Method

Experiment 1 is a subject identification task that required participants to determine *who did what to whom* in dative sentences with variable word order (SVO vs. OVS) and verb type (action verbs vs. psych verbs). The results from this experiment will address research questions 1–2.

2.1.1.1 Participants

The L2 participants and native speaker participants who completed this experiment are the same ones who completed the self-paced reading task in Chapter 2. There were three L2 groups: beginner learners (n = 32), intermediate learners (n = 32), and advanced learners (n = 32). All participants were late L2 learners, which in this study means that they acquired Spanish after the age of 12. This was selected as a cutoff point given that after the age of 12, learners of Spanish were consistently identifiable as non-native speakers with regard to morphosyntax in Granena and Long (2013). As a control, 32 native Spanish speakers also participated in the study. They were recruited based on the researchers' personal knowledge of their language background, and all of them had at least a BA degree. See Table 1.1 in Chapter 2 for a complete description of participants.

2.1.1.2 Materials

The target sentences in this study were a modified version of those from Gattei et al.'s (2017) study that examined the role of word order and verb type on sentences processing. The sentences were the same ones used in the SPR task in Chapter 2, but they will be described again for convenience. The two independent variables were word order

and verb type, each having two levels. This resulted in a 2 x 2 design with four conditions: SVO/Action verb, SVO/Psych verb, OVS/Action verb, OVS/Psych verb. An example of each condition is shown in (2).

(2) a. SVO/Action: Brenda le canta a Carmen y no entiende la razón.

b. SVO/Psych: Brenda le importa a Carmen y no entiende la razón.

c. OVS/Action: A Brenda le canta Carmen y no entiende la razón.

d. OVS/Psych: A Brenda le importa Carmen y no entiende la razón.

The four conditions in (2) represent what is known as an *item* in a psycholinguistic experiment. To ensure that learners would react to the linguistic conditions and not the specific names *Brenda*/*Carmen* or verbs *cantar*/*importar*, a total of 24 different items were created. The pairs of names were unique between items, and traditional male names and traditional female names were not mixed within items so that subconscious gender dynamics between men and women would not influence the interpretation of sentences. With regard to the verbs, it is important to note that each verb was repeated twice. This is because many of the psych and action verbs that take dative objects from Gattei et al. (2017) were uncommon and would have been unfamiliar to many beginner and intermediate L2 Spanish learners. Therefore, instead of using 24 different psych and 24 different action verbs, a total of 12 of each type were used, with one repetition of each verb in two different items. No participant saw the same verb in the same word order more than once.

The 24 items consisting of four conditions were distributed across four lists using a Latin Square design. This ensured that only one of every four participants would read exactly the same target sentences. A total of 48 filler sentences were also added to the

experiment in order to distract participants from focusing on the target sentences. After applying the Latin Square design, the target sentences and the fillers were also randomized for each participant in order to ensure that any effect caused by a certain condition was not a result of the order in which sentences were presented. Both the Latin Square distribution and randomization were completed with the software Linger (Rohde 2001).

2.1.1.3 Methodology

To compare L2 learners' ability to identify grammatical subjects in the four different conditions above, the psycholinguistic methodology known as self-paced reading (SPR) was utilized. With SPR, participants read sentences word-by-word or in segments at their own pace, and the time of each word or segment is recorded. This allows for a precise analysis of comparative processing difficult between conditions. Although reading times are not the focus of this task, this methodology was chosen because it does not allow participants to return to portions of the sentence that they have already viewed. The objective was to understand how well participants determined *who did what to whom* based on a singular reading of the sentence without being able to return and look for explicit grammatical cues (e.g., the object marker *a*). The sentences in this task were divided into segments, which diverges from the most common SPR presentation, which is word-by-word (e.g., Gattei et al. 2015). The reason for this difference is that the lowest level of L2 learners (fourth-semester university Spanish students) in the present study had a fairly low proficiency, and presenting sentences in segments was predicted to ease the overall processing burden for them while still allowing for a sound measurement of data. Table 4.1 illustrates how the target sentences

were divided into segments, or "regions."

Table 4.1. Sample set of stimuli with region labels.

	SVO					
	Brenda	*le canta/ le importa*	*a Carmen*	*y*	*no entiende*	*la razón*
	'Brenda'	'sings/ matters'	'to Carmen'	'and'	'doesn't understand'	'the reason'
	OVS					
	A Brenda	*le canta/ le importa*	*Carmen*	*y*	*no entiende*	*la razón*
	'To Brenda'	'sings/ matters'	Carmen	'and'	'doesn't understand'	'the reason'
Region:	0	1	2	3	4	5

Verb Type Key:

cantar 'sing' = Action verb *importar* 'matter' = Psych verb

Region 0 was a bare NP argument in SVO conditions and a dative-marked NP in OVS conditions. Region 1 contained either a psych verb or an action verb. Region 2 contained a bare NP argument in OVS conditions and a dative-marked NP in SVO conditions. These three regions contained the critical manipulations regarding word order and verb type. A true/false comprehension question was created for all target and filler sentences. In target sentences, the comprehension question required participants to identify the grammatical subject. Within target items, the verb in the comprehension question always matched the verb in the specific sentence. Half of the comprehension questions in the task required a cierto 'true' response and the other half required a falso 'false' response.

For example, after reading the SVO/Action sentence *Brenda le canta a Carmen y no entiende la razón* 'Brenda sings to Carmen but doesn't understand why', one of the two comprehension questions in (3) could have appeared.

(3) a. Brenda le canta a alguien.

Cierto Falso

'Brenda sings to someone.'

'True' 'False'

b. Carmen le canta a alguien.

Cierto Falso

'Carmen sings to someone.'

'True' 'False'

The correct answer for the comprehension question in (3a) would be *cierto* 'true', and the correct answer for (3b) would be *falso* 'false'. A complete set of stimuli for this task is provided in Appendix C.

2.1.1.4 Procedure

Participants first completed a language background questionnaire in order to collect demographic information and to ensure that they were either late L2 Spanish learners who spoke English as a first language or native Spanish speakers (in the case of the control group). Next, they completed the SPR task from Chapter 2, followed by the present subject identification task. Finally, they completed a DELE reading proficiency test. Participants were paid 10 US dollars for a 40–60 minute session.

Before beginning the experiment, participants read an overview of the procedure and they were asked to read sentences at a natural pace so that they could comprehend

what they read. They were given the opportunity to ask for any clarifications before beginning. The self-paced reading task was presented on a 15.4" Macbook Pro laptop computer using the software Linger (Rohde 2001). All sentences were masked and presented in size 24 font with a moving window display. This means that each sentence was presented as a series of dashes (e.g., ----------), and the participants used the space bar to reveal each segment in the sentence in isolation, from left to right. After reading the last segment in a sentence, a true/false comprehension question appeared on the screen. The truth-value of the comprehension question centered around the proper identification of the grammatical subject in target sentences. Participants pressed "D" for *cierto* 'true' or "K" for *falso* 'false'. In addition to the accuracy of the response, response times were also recorded; these were measured from the moment the comprehension question appeared to when the participants selected an answer. Feedback was not given for incorrect responses. In order to familiarize themselves with the format of the experiment, participants completed five practice sentences in English and five in Spanish prior to beginning the experiment. These practice sentences were also followed by true/false comprehension questions. The participants then completed the SPR subject interpretation task consisting of 72 sentences (24 target sentences, 48 filler sentences). After the presentation of the 50th sentence, a message appeared on the screen inviting participants to take a break in order to prevent reading fatigue.

2.1.1.5 Analysis

The focus of the analysis is the response to the yes/no comprehension question that prompted participants to identify the subject argument in sentences. A logit mixed-effects model was constructed in R for each population with comprehension accuracy as

the binary dependent variable and verb type and word order as fixed effects. Based on raw accuracy data, the logit model computed the probabilities that participants would correctly answer the comprehension question in each condition. Since comprehension accuracy was likely to vary between target sentences and participants, "item" and "subject" were respectively added as random effects. Response times were also analyzed using a mixed effects model with response time as the dependent variable. Following the norm of trimming data beyond 2–3 standard deviations of the mean (Keating and Jegerski 2015), only response times within three standard deviations of the mean were included in the analysis. The results will be presented as estimates (β), standard errors, z-scores, and *p*-values. Results that have a *p*-value less than .05 will be considered significant, and those between .05 and .08 will be considered marginally significant.

2.1.2 Results

2.1.2.1 Accuracy

The raw number of incorrect responses from the subject identification task are presented in Figure 4.1. These raw numbers will not be discussed in isolation, but they are provided in order to help the reader contextualize the errors in terms of the number of tokens.

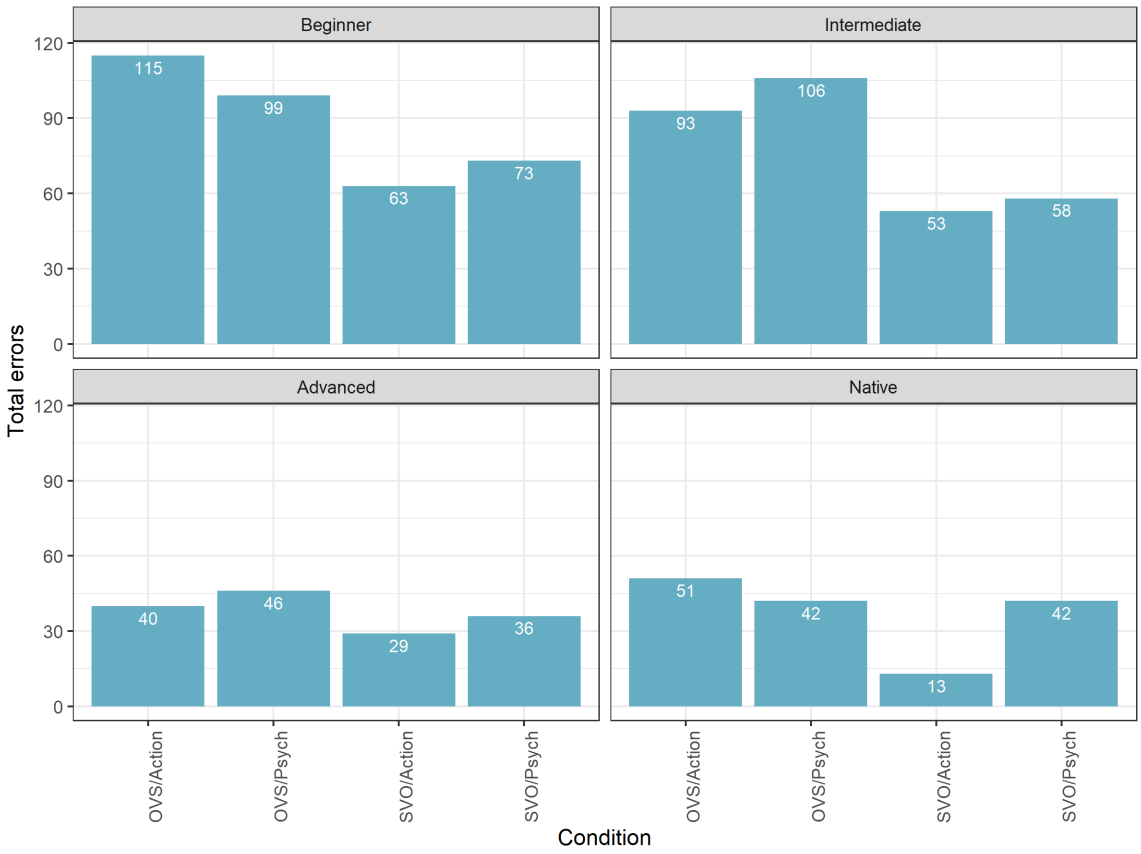


Figure 4.1. Raw number of errors per condition per group from the Spanish subject identification task. There were 192 tokens per condition (e.g., 115 errors/192 total tokens = 40.1% accuracy).

The mean accuracy across all conditions was 55.8% for beginners, 60.9% for intermediates, 80.9% for advanced, and 81.3% for natives. Recall, however, that statistical analysis was not be based directly on raw accuracy scores. Instead, a logit mixed effects model was fitted to the raw data in order to determine the probability that participants would correctly answer the argument identification question in each condition. This probability is represented between 0 and 1 in Figure 4.2, and the results from the statistical analysis follow.

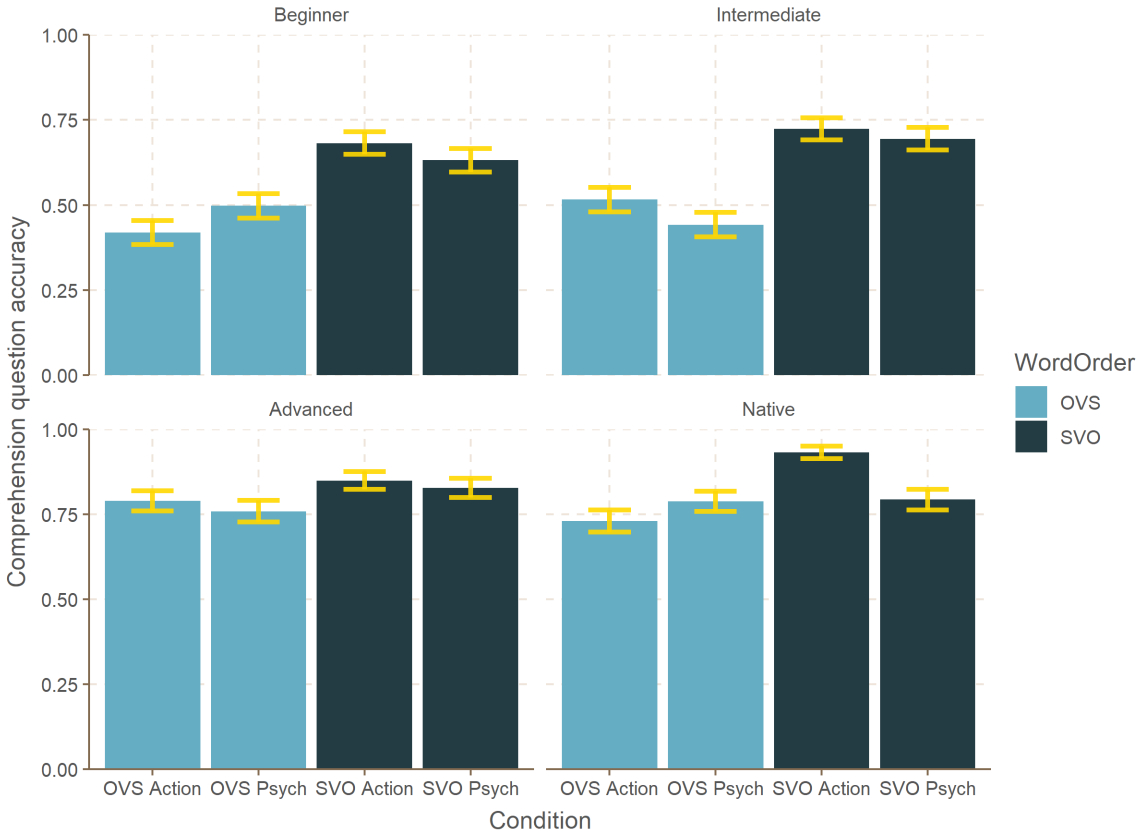


Figure 4.2. Accuracy results from the Spanish subject identification task. The graph indicates the probability of selecting a correct response per condition per group.

In the beginner L2 group, the factor that most clearly affected participants' ability to identify the grammatical subject was word order; SVO conditions were interpreted more accurately than OVS conditions ($\beta = 1.41$, SE = 0.24, $z = 5.82$, $p < .001$). There was also an interaction between word order and verb type ($\beta = -0.69$, SE = 0.33, $z = -2.1$, $p = .04$), which appears to be a combinatory effect of the lower accuracy in the two non-canonical patterns within each word order, OVS/Action and SVO/Psych. Nevertheless, a post hoc Tukey comparison reveals that there were no significant differences between conditions of the same word order: OVS/Psych vs. OVS/Action ($\beta = -0.42$, SE = 0.23, $z = -1.81$, $p = .26$); SVO/Psych vs. SVO/Action ($\beta = 0.28$, SE = 0.24, $z = 1.88$, $p = .64$).

This indicates that the interaction between word order and verb type was not strong enough to outweigh the effect of the most dominant factor, word order.

As was the case in the beginner group, word order was the factor that most reliably predicted an accurate identification of subjects in the intermediate group. The arguments in SVO conditions were interpreted more accurately than in OVS conditions ($\beta = 1.25$, SE = 0.26, $z = 4.87$, $p < .001$). Unlike in the beginner group, there was no measurable interaction between word order and verb type ($\beta = 0.21$, SE = 0.35, $z = 0.6$, $p = .55$). At intermediate proficiency, word order remains the most dominant influence on argument interpretation.

Advanced L2 learners significantly diverge from beginners and intermediates with regard to their ability to identify the grammatical function of arguments. Word order is no longer a strong predictor of accurate sentence interpretation ($\beta = 0.48$, SE = 0.29, $z = 1.7$, $p = .09$). Furthermore, the interaction between word order and verb type appears to have little effect on accuracy ($\beta = 0.01$, SE = 0.4, $z = 0.05$, $p = .96$). A pairwise Tukey comparison between all conditions reveals that there is only one marginal difference between conditions: SVO/Action and OVS/Psych ($\beta = -0.42$, SE = 0.23, $z = 2.44$, $p = .07$). Clearly, advanced learners have corrected for the strong influence of word order that is observed in the beginner and intermediate groups.

In comparison to the advanced L2 group, subject identification in the native speaker group was not completely stable across conditions. For native speakers, the probability of answering the comprehension question correctly was higher in SVO conditions ($\beta = 1.98$, SE = 0.36, $z = 5.49$, $p < .001$) than in OVS conditions. Additionally, there was an interaction between word order and verb type ($\beta = -1.96$, SE = 0.46, $z = -$

4.26, $p < .001$). The most obvious driver of the interaction between word order and verb type was the extreme result in the SVO/Action condition. Figure 4.1 shows that of all the responses from the SVO/Action condition (n = 192) in the native speaker group, only 13 were incorrect. This is an average accuracy of 93.2%, which is significantly higher than any other condition in any participant group. For example, the peak accuracy for the advanced L2 group was also recorded in the SVO/Action condition, but it only reached 84.9%. A post-hoc Tukey test shows that the SVO/Action condition was more likely to be answered correctly than any other condition in the native speaker group. Most notably, this resulted in a distinction that was not seen in any of the L2 learner groups: a distinction between two conditions with the same word order. SVO/Action led to higher comprehension accuracy than SVO/Psych ($\beta = 1.54$, SE = 0.29, z = 4.2, $p < .001$). There is no distinction between the two OVS conditions (OVS/Action vs. OVS/Psych), however ($\beta = -0.41$, SE = 0.27, z = -1.52, $p = .42$).

2.1.2.2 Response times

The accuracy rates reported above document participants' ability to interpret the subject argument in the four word order/verb type patterns, but they do not reveal anything about the timing of responses. For example, if participants ultimately chose the correct option, it was considered "correct" regardless of whether it was answered slowly or quickly. The mean response times for correctly answered comprehension questions are provided in Figure 4.3. Extreme responses times beyond three standard deviations of the mean were excluded from analysis since they were not likely to be reflective of typical comprehension in this group (Keating and Jegerski 2015). This modest data trimming reduced the total observations by 1.4%.

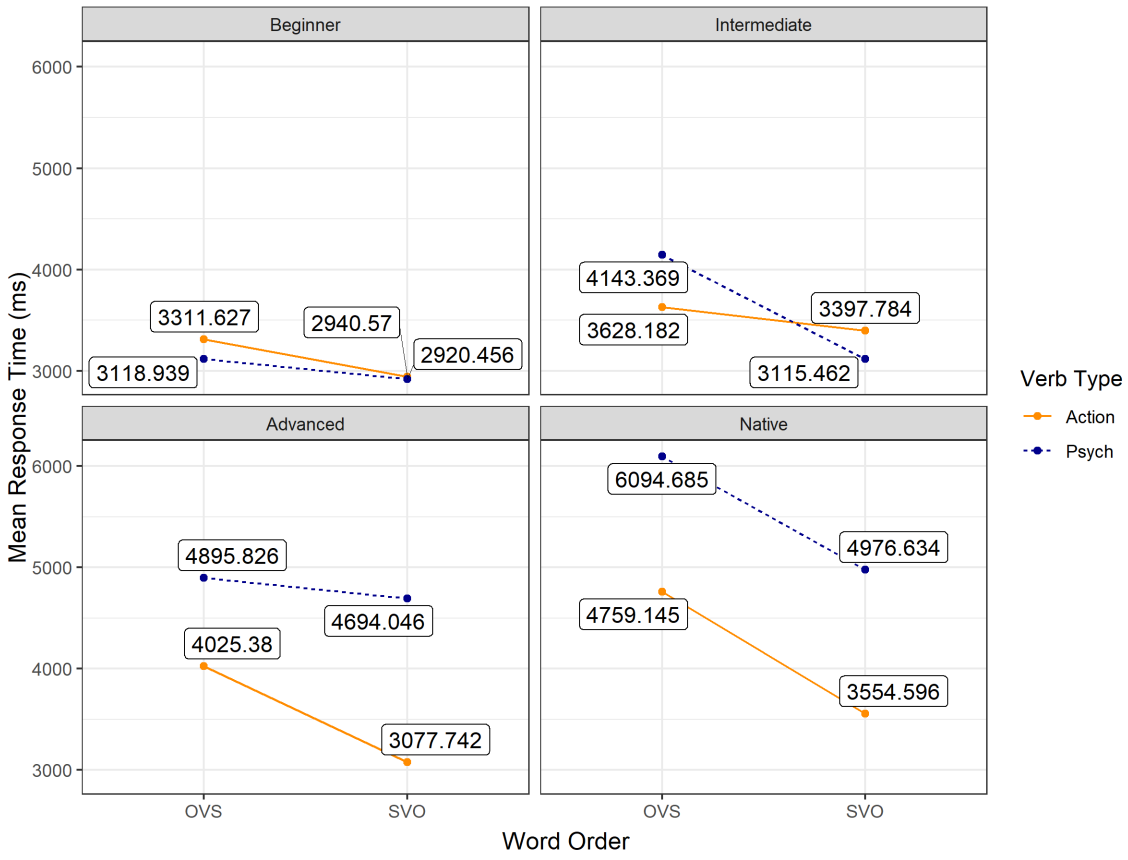


Figure 4.3. Mean response times for correctly answered comprehension questions in subject identification task. Results are shown for each condition in each population.

In order to normalize the distribution of data, the mean response times were log transformed, and were subsequently analyzed in a mixed effects model. In the beginner group, the analysis revealed a main effect of word order. On average, responses times were significantly faster for comprehension questions in SVO conditions ((β = -0.13, SE = 0.06, z = -2.35, p = .02). No other significant effects were found. In the intermediate group, there was no main effect of word order (β = -0.04, SE = 0.06, z = -0.61, p = .54) on comprehension response times. However, there was a significant main effect of verb type, which was caused by the slower average response times in sentences with psych verbs (β = 0.15, SE = 0.07, z = 2.17, p = .03). There was also an interaction between

word order and verb type (β = -0.23, SE = 0.09, z = -2.57, p = .01), which appears to be driven primarily by the significant difference in average response times between SVO and OVS sentences with psych verbs (M = 1,027.9 ms difference). A post-hoc Tukey test shows that comprehension questions in OVS/psych conditions were answered significantly slower (β = 0.27, SE = 0.07, z = 4.08, p < .001) than those in SVO/Psych conditions.

Although the advanced L2 group exhibited remarkable stability in their ultimate accuracy rates across conditions in the comprehension task (see Figure 4.2), an analysis of their response times shows that the speed of their decision-making was greatly affected by both word order and verb type. First, there was a main effect of word order, with SVO sentences leading to quicker response times (β = -0.20, SE = 0.05, z = -3.99, p < .001). Second, there was main effect of verb type, with action verbs prompting faster responses (β = 0.19, SE = 0.05, z = 3.58, p < .001). Finally, there was an interaction between word order and verb type (β = -0.41, SE = 0.27, z = -1.52, p = .03). A post-hoc Tukey test reveals that comprehension questions were answered more quickly when action verbs appeared with an SVO word order as opposed to OVS (β = 0.20, SE = 0.05, z = 3.99, p < .001). However, this distinction between SVO and OVS conditions was not observed in sentences with psych verbs (β = 0.04, SE = 0.05, z = 0.79, p = .86). The Tukey test also revealed that the response delay caused by psych verbs was relative within each word order: SVO/Action conditions received a quicker response than SVO/Psych ones (β = -0.35, SE = 0.05, z = -6.93, p < .001), and OVS/Action conditions received quicker responses than OVS/Psych ones (β = -0.35, SE = 0.05, z = -6.93, p < .001).

As was the case in advanced L2 group, the speed of native speakers' decision-making on the comprehension questions was also modulated by word order and verb type. A main effect of word order reveals that SVO conditions led to faster response times than OVS conditions (β = -0.32, SE = 0.05, z = -6.43, $p < .001$). Additionally, a main effect of verb type indicates that participants responded to the comprehension questions faster with action verbs than with psych verbs (β = 0.24, SE = 0.05, z = 4.76, $p < .001$). A pairwise Tukey test shows that the response delay caused by psych verbs was relative within each word order: SVO/Action conditions received a quicker response than SVO/Psych (β = -0.35, SE = 0.05, z = -7.15, $p < .001$), and OVS/Action conditions received quicker responses than OVS/Psych ones (β = -0.24, SE = 0.05, z = -4.76, $p < .001$). Similarly, the relative response delay caused by OVS sentences in comparison to SVO sentences was seen regardless of the verb type: SVO/Action led to faster response times than OVS/Action (β = 0.32, SE = 0.05, z = 6.43, $p < .001$), and SVO/Psych led to faster response times than OVS/Psych (β = 0.21, SE = 0.05, z = 4.18, $p < .001$).

2.1.2.3 Summary of results

Here the research questions that guided Task 1 are repeated here:

1. Is the ability to correctly identify sentential subjects by L2 learners of Spanish at differing proficiency levels (i.e., beginning, intermediate, advanced) affected by word order (i.e., SVO/OVS) and verb type (i.e., action/psych) in sentences with dative case? Specifically, do learners show differences in accuracy on the following types of sentences?
    a. Action verb: SVO
    b. Action verb: OVS

c. Psych verb: OVS

d. Psych verb: SVO

2. Do word order and verb type affect L2 learners' response times when correctly identifying subjects?

Based on the results presented above, the answer to the questions can be summarized in the following way:

1. For advanced L2 learners, the answer is 'no.' Their accuracy on the subject identification task was not affected by either word order or verb type. On the other hand, beginner and intermediate learners' accuracy was affected by word order: OVS sentences resulted in lower accuracy. Verb type did not have a significant influence on their accuracy. Native speakers' accuracy was unlike all other groups. It was conditioned by word order and the interaction between word order and verb type, and was highest in the SVO/action condition.
2. Yes, word order and verb type affect L2 learners' response times when correctly identifying subjects, and the sensitivity to these variables increases with proficiency. Beginners were sensitive only to word order. Intermediate learners' response times were affected by verb type and the interaction between word order and verb type. The advanced learners were sensitive to word order, verb type, and the interaction between these two variables. Native speakers' response times were most similar to the advanced learners' in that they were also affected by word order and verb type. However, the interaction between the two variables did not reach

significance in the native speaker group. In all groups, if either word order or verb type affected response times, it was OVS sentences and psych verbs that slowed responses.

2.1.3 Discussion of Experiment 1

The overall accuracy rates in the subject identification task show that university students—even Spanish majors and minors (the "intermediate" group)—struggle with decontextualized sentence interpretation. The beginner and intermediate L2 learners respectively achieved 55.8% and 60.9% accuracy, but these low rates were skewed by their particularly poor accuracy in sentences with OVS word order. This implies that these learners rely heavily on a sentence processing heuristic such as the First Noun Principle (VanPatten 1996). With such a heuristic, beginner and intermediate learners assume that the first noun in the NVN sequence is the grammatical subject. If the experimental sentence turns out to be an SVO sentence, this matches the participants' heuristic-based strategy, and they perform comparatively well on the comprehension task that requires them to answer a true/false question regarding *who did what to whom*. However, OVS sentences directly conflict with the participants' subject-first heuristic, and they frequently misinterpret the first argument as the subject. Even though all sentences contained the preposition *a*, which unambiguously identifies the object argument in Spanish dative sentences, beginner and intermediate learners did not make effective use of it. It is likely that they still noticed the preposition, however, which is supported by the SPR results from Chapter 2. Nevertheless, because of their lack of knowledge regarding the grammatical function of *a* or their inability to employ this knowledge in real time, they resort to simple subject-first parsing heuristic (VanPatten

1996) to interpret sentences. Verb type did not play a significant role in subject identification for beginner or intermediate learners.

The response time data from the beginner group correlates well with their accuracy rates. Among the correctly answered questions, it took beginners longer to determine the subject in OVS sentences when compared to SVO sentences. This reflects a slower retrieval of grammatical information in conditions that did not match their subject-first parsing strategy. The intermediate groups' response times for comprehension questions, however, were not influenced by word order. Instead, they were affected by a word order/verb type interaction; it took them longer to determine the subject in OVS/Psych conditions when compared with SVO/Psych conditions. This slow response time in OVS/Psych conditions corresponds with these participants' lowest mean accuracy in this condition. This is not surprising based on many L2 studies that have documented L2 learners' lack of grammatical knowledge regarding the use of OVS/Psych sentences (Montrul 1998; Kanwit and Lubbers Quesada 2017). It could be that by the intermediate level, learners have begun to internalize the syntactic-semantic mapping conflicts between some class III psych verbs and their English equivalents (e.g., *gustar* and *like*). Since class III psych verbs are used most commonly in OVS word order in Spanish (Gattei et al. 2015), intermediate learners might be becoming familiar with the OVS/psych combination and recognize it as being difficult. However, they still have not developed a strategy to cope with this difficulty.

The advanced L2 group dramatically outperformed the beginner and intermediate groups on the subject identification task, averaging 80.9% accuracy across all four conditions. The probability of these participants answering the subject-identification

comprehension question correctly was not significantly influenced by either word order or verb type. Put differently, regardless of the canonicity of word order/verb type patterns, advanced learners performed rather evenly across conditions. Since the main disambiguating cue regarding *who did what to whom* was the object marker *a*, it is clear that these learners were able to make effective and consistent use of it in real time. Their high accuracy in subject identification does not necessarily indicate that they were not sensitive to word order/verb type canonicity while reading the sentences; based on the results from Chapter 2, it is likely that these advanced learners were sensitive to said factor. Additionally, their results do not necessarily imply that they were not also using some sort of subject-first heuristic when initially parsing sentences, like beginner and intermediate learners. In the context of this task, the minimalist interpretation of advanced learners' stable accuracy is the following: regardless of any influence of word order or verb type, advanced L2 learners understand the function of the object marker *a* and can use it in real time to reliably determine the grammatical object (and by process of elimination, the subject) of a sentence.

If a group of native speakers had not been included in the study, one might have concluded that the advanced L2 group exhibited nativelike comprehension in the subject identification task. Recall that Malovrh and Lee (2009) assumed that correct subject identification in their aural comprehension task would be synonymous with nativelike comprehension. Nevertheless, in the current study, the native speaker group's accuracy was affected by the interaction between word order and verb type. Specifically, the canonical SVO/Action condition resulted in a significantly higher accuracy than the

remaining three conditions: SVO/Psych, OVS/Action, and OVS/Psych. The accuracy in these latter three conditions was statistically indistinguishable.

Recall that this task was based on one from Gattei et al. (2017), an eye-tracking study that assessed the effect of word order and verb type on native Spanish speakers' sentence processing and ability to interpret *who did what to whom*. Because their participants were presented with full sentences (not a moving window), they were able to reread sentences if needed before being presented with the comprehension question related to subject identification (however, once the comprehension question appeared, they could not reread the sentences). Regardless of this significant difference in methodology, the distribution of the results from both studies is strikingly similar. The accuracy results from Gattei et al. (2017) subject identification task are shown in Figure 4.4; they correspond with the native speaker results from Figure 4.2 in the present study.

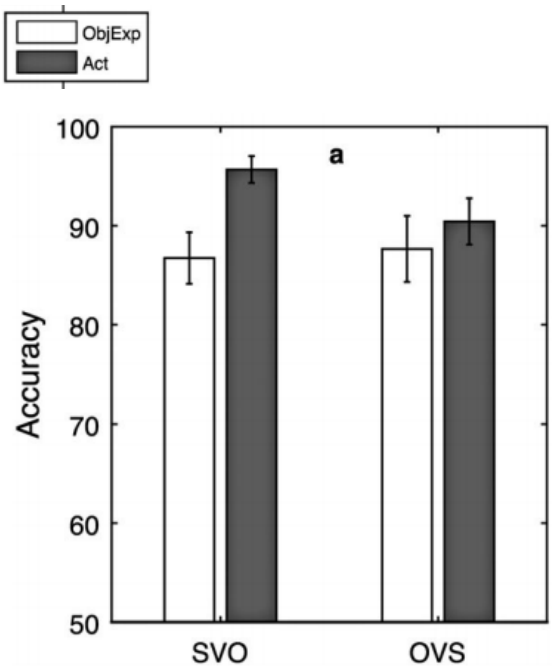


Figure 4.4. Accuracy results from subject identification task in Gattei et al. (2017)

A comparison of the results seen in Figure 4.2 and Figure 4.4 reveals that both groups of native speakers were affected by the interaction between word order and verb type when determining *who did what to whom*. In both studies, a post-hoc Tukey test confirmed that comprehension was most accurate in the SVO/Action condition. In Gattei et al. (2017) there was also an additional main effect of verb type, with action verbs leading to higher accuracy. In the present study, there was an additional main effect of word order, with SVO word order leading to higher accuracy. Nevertheless, the fact that both groups were sensitive to the interaction between word order and verb type with a clear comprehension advantage in the SVO/Action suggests that nativelike subject identification is not characterized by equal accuracy across all conditions.

Although advanced L2 learners appear to be unaffected by changes in word order and verb type based on their comprehension accuracy (see Figure 4.2), their response times to the comprehension questions paint a different picture. There was a significant main effect of word order, verb type, and an interaction between word order and verb type. The native Spanish speakers' reading times also showed sensitivity to the main effects of word order and verb type. In both groups, SVO word order and action verbs were correlated with quicker response times. For comparison, the response time results from the comparable comprehension task in Gattei et al. (2017) are provided in Figure 4.5.

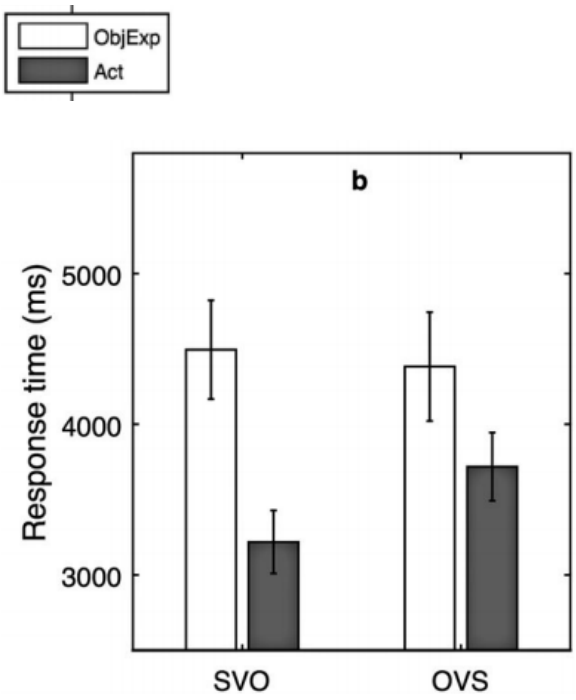


Figure 4.5. Response time results from subject identification task in Gattei et al. (2017)

In Gattei et al. (2017), an analysis of the response times revealed a main effect of verb type and an interaction between word order and verb type. Although there are some differences, two common findings can be extrapolated from the response times from the advanced L2 group and native speaker group from this study, and the native speaker group from Gattei et al. (2017). First, psych verbs, regardless of word order, significantly delay decision making when participants are attempting to distinguish subjects from objects. This is not a surprise based on the decades of research that has shown that psych verbs are "special", which complex syntactic-semantic relationships between arguments that are not observed in any other verb class (Landau 2010). Second, more than in any other condition, participants most quickly identified the subject in SVO/Action sentences,

which was confirmed by post-hoc Tukey comparisons in all three groups[9]. This finding confirms that participants did not simply rely on word order to retrieve information about the grammatical subject from their memory. This is not a trivial finding, since sentence-processing research has shown that the first entity that a participant encounters in a sentence tends to be easily accessed from memory (Gernsbacher 1990). In SVO/Action and SVO/Psych conditions, the sentence-initial subject should be equally accessible in memory, so the increased speed with which all three participant groups identified the subject in SVO/Action conditions is clearly a result of a linguistic phenomenon. The advantage provided by the SVO/Action condition could be explained by the assumption that it is a canonical pattern in terms of the organization of its thematic relations, while SVO/Psych is a non-canonical pattern (Gattei et al. 2015). This finding supports previous research that reports higher comprehension accuracy in canonical contexts (e.g., Ferreira 2004). It is interesting, then, that the canonical and non-canonical OVS patterns—OVS/psych and OVS/action (Gattei et al. 2015)—were not also distinguished clearly in this experiment. However, the strong contrast between canonical and non-canonical SVO conditions in comparison to a weak or absent contrast between canonical and non-canonical object-initial conditions has been a consistent pattern throughout this dissertation. As discussed in Chapters 2-3, there appears to be something about object-initial sentences that elicits a unique mental response that causes canonicity to be processed differently (Bornkessel and Schlesewsky 2006; Gattei et al. 2015).

[9] The advanced L2 group and native speaker group from this study, and the native speaker group from Gattei et al. (2017)

An important distinction between the native and non-native participants emerged. In the native speaker groups, there was a more transparent link between the accuracy and response times in the subject identification task; *both* were affected by word order and verb type (e.g., SVO/Action led to highest accuracy and fastest responses). The advanced L2 group, however, showed sensitivity to these factors in their response times, but not in their comprehension accuracy. I hypothesize that advanced learners blocked this effect because they focused on the object marker *a* more explicitly. When they were only beginners and intermediates, they most likely relied on word order as the strongest cue when interpreting sentences; this probably failed them, as evidenced by the results from the lower proficiency groups in this study. At some point in their development, the advanced learners began to rely more on *a* as a reliable cue when interpreting the grammatical function of arguments in dative sentences. In terms of the Competition Model (Bates and MacWhinney 1989), they might have re-ranked this cue as being more important than word order. It is possible they even exaggerated this re-ranking, which made them more sensitive to the function of *a* than the average native Spanish speaker. This hypothesis is based on the fact that all participants in the advanced L2 group received many years of formal instruction in Spanish, and 31 of 32 of them were Spanish instructors. Consequently, they might have been acutely sensitive to grammatical cues (e.g., *a*) that they learned explicitly and regularly highlight for their own students. Native speakers, on the other hand, seem to be guided more transparently by their natural reactions to the effects of word order and verb type, which is why these effects were observed in both response times and comprehension accuracy.

2.2 Experiment 2: Within-participant subject identification task (L2 Spanish and L1 English)

Experiment 1 showed that beginner and intermediate learners struggle with identifying the correct subject in OVS sentences. This could be explained with the FNP (VanPatten 2004): due to a universal parsing tendency, L2 learners identify the first NP as the subject regardless of word order. On the other hand, the low accuracy with OVS conditions could be interpreted to be a result of the L1 Transfer Principle: L1 English speakers transfer their predominant L1 parsing strategies to their L2 (VanPatten 2015). There is still one more possibility: the low accuracy in the OVS sentences could reflect L1 English speakers' lack of familiarity with dative case and dative marking with psych verbs (Montrul 1998; Kanwit and Lubbers Quesada 2017). Experiment 2 is designed to test these different possibilities by comparing English and Spanish sentence comprehension within the same group of participants, and the results will address research question 3.

Before discussing Experiment 2, it important to point out a departure from previous studies. Although some L2 scholars argue there is no dative case in English (Montrul 1998) or dative marking on English psych verbs (Kanwit and Lubbers Quesada 2017), the phenomenon known as "dative alternation" has been studied in both L1 and L2 English research (Jäschke and Plag 2016; Levin and Rappaport Hovav 2005). While English does not mark dative case morphologically (like German, for example), it does use the marker "to" to signal dative case with both action verbs and class III psych verbs ("Sam gave the ball *to* Ted"; "Sam matters *to* Ted"). This marker serves the same function as the analytical dative marker *a* in Spanish. However, just because English has

overt dative marking, it does not necessarily mean that English speakers can use this marking in real time to distinguish objects from subjects in different word orders, which will be addressed in the English subject identification task described in the next section.

2.2.1 Method

Experiment 2 consists of two subject-identification tasks designed to probe L2 Spanish speakers' ability to parse both SVO and non-SVO word orders in dative sentences in Spanish and in their L1, English. The results will reveal the flexibility of their parser in both languages and participants' ability to distinguish dative and nominative case.

2.2.1.1 Participants

Forty L2 learners of Spanish (L1 English) were recruited from a fourth-semester Spanish class at a large public university. None of the participants had significant exposure to Spanish before the age of 12. The fourth-semester Spanish level was targeted because it was the same level from which the "beginner" participants were recruited for Experiment 1. Results from this previous experiment showed that beginner learners rely heavily on subject-first processing in Spanish and do not make effective use of the dative object marker *a* when identifying the grammatical subject in a sentence. However, L1 English data in dative sentences was not collected, which made it difficult to speculate as to the role that L1 transfer could conceivably play in subject identification. Therefore, this new group of beginner learners completed a within-subject L1 English/L2 Spanish subject interpretation experiment. In order to confirm that these learners had roughly the same proficiency level, they completed the same DELE reading proficiency test as the participants from Experiment 1. The average score was 11.95/34 (range of scores: 7-16),

which is slightly lower than the average from the beginner group from Experiment 1 (12.8/34). However, an independent samples *t*-test confirmed that the average proficiency between the new group of beginners and the beginners from Experiment 1 was not significantly different ($t(70) = 1.1$, $p = .27$).

2.2.1.2 Materials and methodology

The two subject identification tasks—one in Spanish and one in English—were designed using the SPR methodology, following Experiment 1. The 24 target items for the Spanish version were identical to those from Experiment 1 (see Table 4.1 and the related comprehension questions). The critical manipulations were related to word order (SVO vs. OVS) and verb type (action v. psych). The focus of the task was the comprehension question that appeared after each sentence that required participants to answer a true/false question about the subjecthood of the arguments. In these subject identification tasks, the number of fillers was reduced to 32, which resulted in a task with 56 total sentences (see Appendix D). This reduction was made in order to make the session more manageable because the participants also completed two other unrelated SPR tasks (one in English, one in Spanish). The focus of these unrelated tasks was the effect of word order and verb type on online sentence processing, and participants were not asked to identify the grammatical function of arguments. The results of these two unrelated SPR tasks will not be reported in this dissertation.

While every effort was made to make the English task as similar as possible to the Spanish task for a fair comparison, some modifications had to be made. These changes to the English task were warranted because English and Spanish differ with regard to the naturalness of specific word orders, and some English psych verbs have a different

argument structure than the comparable Spanish verbs. Still, the critical manipulations related to word order and verb type were meant to be comparable across the two tasks. Unlike Spanish, the OVS word order is not used often in English. Instead, the most natural object-initial word order is OSV (Namboodiripad 2017): "To me, John seems like a nice person." Therefore, instead of the contrast being SVO vs. OVS, it will be SVO vs. OSV in the English task, which will still allow for a comparison of how well English speakers can parse both object-initial and object-final word orders in dative sentences.

The verb type manipulation in the English task was the same as in the Spanish task. Half of the verbs were action verbs with an Agent and a dative object Recipient, and half were class III psych verbs with a Theme and a dative object Experiencer. There were six verbs of each type (12 total), so each verb was used twice in order to make 24 items. The sentences were divided into segments ("regions"). The critical manipulations related to word order and verb type were found in the first four regions, and two or three spillover regions followed. A sample item is provided in Table 4.2.

Table 4.2. Sample item from the English subject-identification task.

Condition	Example						
SVO/Action		Kelly	talked sincerely and openly	to Marie	at	the Alcoholics Anonymous meeting	over the weekend
SVO/Psych		Kelly	looked pale and malnourished	to Marie	at	the Alcoholics Anonymous meeting	over the weekend
OSV/Action	To Marie	Kelly	talked sincerely and openly		at	the Alcoholics Anonymous meeting	over the weekend
OSV/Psych	To Marie	Kelly	looked pale and malnourished		at	the Alcoholics Anonymous meeting	over the weekend
Region:	0	1	2	3	4	5	6

A true/false comprehension question was created for all target and filler sentences. In target sentences, the comprehension question required participants to identify the grammatical subject. Within target items, the verb in the comprehension question always matched the verb in the specific sentence. Half of the comprehension questions in the task required a 'true' response and the other half required a 'false' response. For example, after reading the OSV/Psych sentence *To Marie, Kelly looked pale and malnourished at the Alcoholics Anonymous meeting over the weekend*, one of the two comprehension questions in (4) could have appeared.

(4) a. It was Kelly who looked pale and malnourished.

True False

b. It was Marie who looked pale and malnourished.

True False

The correct answer for the comprehension question in (4a) would be 'true', and the correct answer for (4b) would be 'false'. A complete set of stimuli for this task is provided in Appendix E.

2.2.1.3 Procedure

Participants first completed a language background questionnaire to ensure that they were late L2 Spanish learners who spoke English as a first language. Next, they completed a Spanish SPR task unrelated to this experiment, followed by the current Spanish subject identification task. They were allowed to take a break at this point. Next, they completed an English SPR task unrelated to this experiment, followed by the current English subject identification task. The two subject identification tasks were separated by the unrelated SPR tasks so that it would be less likely for them to identify the focus of the tasks. Each task (including the unrelated tasks) consisted of 56 questions, and they were able to finish each in approximately 8-12 minutes. Finally, participants completed the abbreviated DELE reading proficiency test. Participants were paid 10 US dollars for a 60-minute session.

The procedure for the Spanish and English subject identification tasks was the same. Before beginning the experiment, participants read an overview of the procedure and they were asked to read sentences at a natural pace so that they could comprehend what they read. They were given the opportunity to ask for any clarifications before

beginning. The self-paced reading task was presented on a 15.4" Macbook Pro laptop computer using the software Linger (Rohde 2001). All sentences were masked and presented in size 24 font with a moving window display. This means that each sentence was presented as a series of dashes (e.g., ----------), and the participants used the space bar to reveal each segment in the sentence in isolation, from left to right. After reading the last segment in a sentence, a true/false comprehension prompt appeared on the screen. The truth-value of the comprehension question centered around the identification of the grammatical subject in target sentences. Participants pressed "D" for *true* or "K" for *false*. Feedback was not given for incorrect responses. In order to familiarize themselves with the format of the experiment, participants completed five practice sentences in English and five in Spanish prior to beginning the subject identification experiment in Spanish. These practice sentences were also followed by true/false comprehension questions. Since they were already familiar with the general procedure, they did not receive practice sentences before completing the English subject identification task.

2.2.1.4 Analysis

For each subject interpretation task, a logit mixed effects model was created for each population with comprehension accuracy as the binary dependent variable and verb type and word order as fixed effects. The logit model computed the probabilities that participants would correctly answer the comprehension question in each condition. Since comprehension accuracy was likely to vary to some degree between target sentences and participants, "item" and "subject" were respectively added as random effects.

2.2.2 Results

2.2.2.1 Results from L2 Spanish (beginners) subject identification task

The results from the L2 Spanish subject identification task are shown in Figure 4.6.

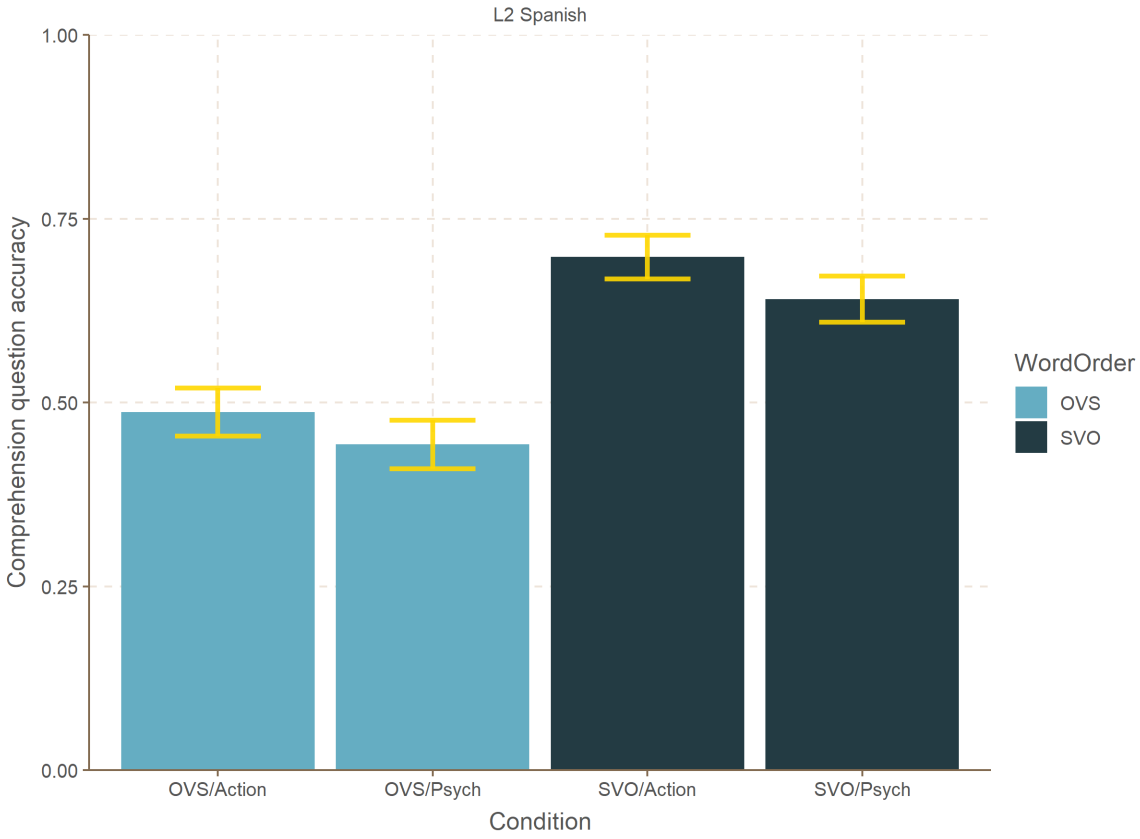


Figure 4.6. Accuracy results for within-participant subject identification task (beginner L2 Spanish)

The analysis revealed a main effect of word order; L2 Spanish learners more accurately identified the grammatical subject in SVO sentences than in OVS sentences ($\beta = 1.24$, SE = 0.23, $z = 5.36$, $p < .001$), which was the same result observed in Experiment 1. There was no effect of verb type and no interaction between word order and verb type ($p > .05$).

2.2.2.2 Results from L1 English subject identification task

The L1 English results from the same participants are presented in Figure 4.7.

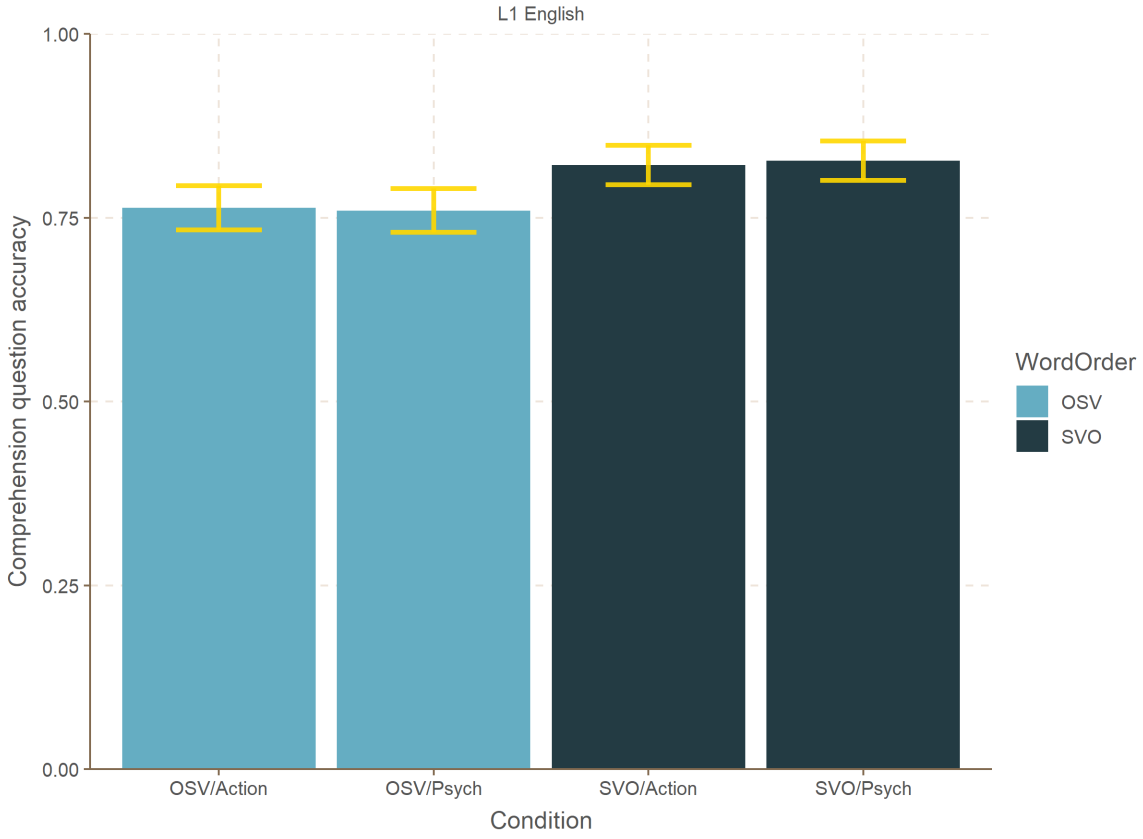


Figure 4.7. Accuracy results for within-participant subject identification task (L1 English)

The mixed effects analysis did not register any significant main effects or interactions. This indicates that English speakers identified grammatical subjects with comparable accuracy in dative sentences regardless of word order or verb type.

2.2.2.3 Summary of results

The research question that guided this task is repeated here:

> Within the same group of learners, do word order and verb type affect subject identification accuracy in L1 English and L2 Spanish in a similar way in sentences with dative objects?

The results from Experiment 2 indicate that the answer to this question is 'no'. Although beginner L2 Spanish learners' ability to identify grammatical subjects is negatively affected by the object-initial word order OVS in Spanish, their ability to identify grammatical subjects is not negatively affected by the object-initial word order OSV in English, their L1.

2.2.3 Discussion of Experiment 2

The results from the L2 Spanish subject identification task confirm the results from Experiment 1. Beginner L2 Spanish learners use a subject-first parsing strategy (e.g., VanPatten 2004), regardless of whether the sentence is SVO or OVS; this leads to low accuracy levels in OVS conditions since the first noun is not the subject. In contrast, these same learners performed much more accurately on the English subject identification task. They did not rely on a subject-first strategy to interpret the grammatical function of arguments in SVO and OSV sentences; instead, they must have used the preposition "to" to identify the dative object, which in turn allowed them to identify the other NP as the subject. This consistent performance across the four conditions demonstrates the agility of L1 English speakers' parser in subject-initial and object-initial dative sentences.

Because the participants performed with equal accuracy across SVO and OSV dative sentences in English, their unsuccessful interpretation of arguments in object-initial dative sentences in Spanish does not seem to be due to a deficiency of the English parser (Isabelli 2008). Additionally, since the participants were able to use the dative marker "to" effectively in English in order to identify objects, their failure to make effective use of the Spanish dative marker *a* to identify objects does not reflect a lack of familiarity with the dative case in general (Kanwit and Lubbers Quesada 2017). One could claim that it is not clear that English speakers are truly relying on the dative marker "to" to identify objects (and by deduction, subjects). It is possible that they are relying on a "second-noun" heuristic that leads English speakers to identify the second noun as the subject in OSV sentences (Bates et al. 1982). For example, after hearing the NNV sequence "The cow the horse kicks," an English speaker will usually interpret the horse to be the actor/subject (Bates et al. 1982). However, in this sentence, "the cow" can easily be interpreted as a left-dislocated or topicalized object of "kicks," which by deduction, makes "the horse" the subject. In the dative sentences in the current study, on the other hand, the interpretation of the sentence hinges on the presence or absence of the dative marker "to". For example, upon removing the "to" from the OSV/Psych condition in Table 4.2, as seen in (5), it is extremely difficult to interpret "Marie" as an object.

(5) *Marie, Kelly looked pale and malnourished at the Alcoholics Anonymous meeting last weekend.

Without a "to" before "Marie," the most natural interpretation of the sentence is one which someone is speaking directly to "Marie" and says her name with a vocative function. With a "to" before Marie, it becomes clear that the sentence is dative and that

"Marie" is not the interlocutor, but instead the dative object experiencer (i.e., the person from whose perspective "Kelly looked pale and malnourished"). Therefore, I interpret English speakers' correct interpretation of OSV sentences to be a reflection of their inherent knowledge of dative case rather than a result of their use of a simple word order heuristic that would have guided them toward the same understanding of the sentence even without the dative object marker "to."

If English speakers have inherent knowledge of dative case and their parser is capable of correctly assigning grammatical functions to arguments in both subject-initial and object-initial sentences, the question remains: why can they not apply this knowledge and parse dative sentences of variable word order with equal success in L2 Spanish? The answer may be that they simply do not recognize *a* as a dative object marker. Based on the results from Chapter 2, it is likely that beginner L2 Spanish learners see the *a*, but they do not interpret it with its proper function. The reason for this could be due to the many different functions of the Spanish *a*, many of which are unrelated. For example, *a* can be a direct object marker before animate direct objects (*Vi a Sara*), a preposition in locative prepositional phrases (*Fui a la tienda*), a preposition in multi-verb constructions (*Aprendí a leer*), or a dative object marker (*Le di la moneda a Ana*); it is also used in many unrelated expressions (*a solas; ¿A qué sí?*; *a huevo*; *a escondidas*). In terms of the Competition Model (Bates and MacWhinney 1989), the many unrelated uses of the preposition *a* make it unreliable for a L2 Spanish learner. L2 acquisition occurs optimally when linguistic objects have one function and one meaning (Andersen 1984), because this allows learners to form simple form-function relationships in their developing second language. L2 Spanish learners find it difficult to sort out these different uses of *a*, and as

a result, they do not process it as object marker in dative sentences even though they are able to effectively do so with "to" in their native English.

3. General discussion and conclusions

In this chapter, several of the gaps in L2 research identified by Malovrh and Lee (2013) have been addressed. Specifically, this study has provided cross-sectional data that documents the development of L2 learners' interpretation of variable word order in sentences with dative case. The results from Experiment 1 (Spanish subject identification task) show that word order is the factor that most strongly influences a beginner and intermediate L2 learners' ability to distinguish subject and object arguments in SVO and OVS sentences. Regardless of whether they are motivated by the FNP or the L1 Transfer Principle (VanPatten 1996), it is clear that they employ a subject-first parsing strategy that results in low accuracy in OVS conditions. Verb type is not a main influence for these learners; they do not perform significantly better in conditions of the same word order in which the only difference is verb type (e.g, SVO/Action vs. SVO/Psych). Therefore, word order/verb type canonicity (Gattei et al. 2015) does not appear to play a significant role in these learners' sentence interpretation. The intermediate group does show some emerging sensitivity to the OVS/Psych condition, however, which is indicated by the slower response times in this condition. As mentioned, this is a possible sign that they are becoming sensitive to the syntax-semantics mapping mismatches between class III Spanish psych verbs (e.g., *gustar*) and their English equivalents (*like*).

The subject-identification results from the advanced L2 and native speakers reveal the importance of not assuming a priori what nativelike behavior might look like in a linguistic task. Advanced L2 learners' accuracy on the subject-identification task was

stable across all conditions, but it turns out that this performance is not nativelike. After comparing native speakers' performance in this study with the data from a similar task in Gattei et al. (2017), it appears that native speakers' ability to accurately interpret subject arguments (in experimental conditions, at least) is affected by word order/verb type canonicity. To be precise, the canonical SVO/Action condition leads to quicker decision-making and higher accuracy in comparison to all other conditions. Advanced L2 learners also appeared to receive a processing benefit from the SVO/Action condition; response times indicate that they answered comprehension questions most quickly in this condition, just like native speakers. However, this processing advantage did not manifest in their ultimate identification of grammatical subjects, since their comprehension accuracy was indistinguishable across conditions. I hypothesize this to be a result of advanced L2 learners' more explicit use of the object marker *a* to identify the grammatical function of arguments. Since almost all of these learners had received many years of formal instruction in Spanish and were Spanish instructors themselves, it is likely that they received explicit instruction regarding the use of *a* at some point and have explicitly emphasized the function of *a* to their students. Therefore, while advanced and native speakers may have experienced the similar processing effects across conditions, advanced speakers effectively suppressed them by employing a processing strategy that weighted the object marker *a* as the most important cue. Native speakers still rely on *a* as a disambiguating cue to identify *who did what to whom*, but their accuracy is also modulated by the interaction between word order and verb type. Any condition that has OVS word order or a psych verb will be slightly more difficult to interpret than the one condition that has neither: SVO/Action.

Experiment 2 addressed the question of whether L1 English speakers rely more on universal or L1 specific forces when distinguishing subjects from objects in dative sentences in L2 Spanish. The results suggest that L1 English speakers are familiar with dative case and that they can utilize the English dative object marker "to" to identify objects with similar accuracy across four word order/verb type combinations. This does not support Montrul (1998) and Kanwit and Lubbers Quesada' (2017) hypothesis that L2 learners' misunderstanding of dative sentences in Spanish is due to a lack of similar knowledge in their L1. Additionally, the fact that L1 English speakers were able to identify subjects with similar accuracy in both SVO and OSV word order challenges the hypothesis that the unsuccessful interpretation of non-SVO sentences in L2 Spanish is due to an inflexibility of the English parser (Isabelli 2008; VanPatten 2015). It is important to emphasize that this study focused on dative case, so the results could very well be different in a study with accusative objects. There may be more overlap between English and Spanish with regard to the interpretation of dative case as opposed to accusative case. To elaborate, Spanish accusative object pronouns such as *la* have inherent case that forms part of their lexical content (VanPatten 2015) and there is no English equivalent; this contrasts with dative object NPs that receive their case from the analytical object marker *a* in Spanish (e.g., *A Juan*), which corresponds with the English "to" (e.g., *To John*). Because of the differences in accusative and dative case marking between Spanish and English, the expectations with regard to the interpretation of accusative and dative objects would likely be different, and consequently, the theoretical implications might be different. More research is required in this area.

In the context of dative sentences, beginner L2 learners' unsuccessful interpretation of non-SVO word orders in Spanish is not likely due to a lack of L1 knowledge related to dative sentence interpretation. Instead, their L2 Spanish performance is more likely due to a failure to properly process the preposition *a* as a dative object marker. The preposition *a* is an unreliable marker in Spanish because of its wide array of unrelated uses (Bates and MacWhinney 1989). After failing to properly interpret the function of *a*, L2 Spanish learners simply default to interpreting sentences with a subject-first strategy (VanPatten 1996). Scholars could claim that this is still indicative of English influence, since English is a mainly SVO language in which subjects most commonly appear in sentence-initial position. Nevertheless, because a subject-first bias continues to be supported crosslinguistically in both L1 and L2 research (Bever 1970; Erdocia et al. 2014; Ervin-Tripp 1974; Ferreira 2003; Slobin 1973; VanPatten 1984), it is not possible to discount a universal parsing strategy (e.g., FNP) as the driving force in beginner/intermediate L2 Spanish processing.

Chapter 5: Summary and Conclusion

The overall goal of this dissertation was to determine if and when L2 learners can become nativelike processors and to consider how their L1 might influence their L2 processing. To address these broad issues, I examined the interaction between word order (subject-initial vs. object-initial) and verb type (action vs. psych) in L2 Spanish and L1 English sentence processing. This chapter summarizes the findings in the previous chapters with a focus on theoretical significance. The chapter will conclude with a discussion of limitations and future directions.

1. Main findings from Chapters 2-4

(1) *Findings related to L2 and native Spanish sentence processing*

a) Broadly speaking, the participants grouped by behavior into beginning/intermediate and advanced/native.

b) During online processing, beginner and intermediate L2 learners are guided primarily by word order cues; subject-initial conditions are read more quickly than object-initial ones. Intermediate learners show (marginal) sensitivity to the interaction between word order and verb type, which is a sign that they are beginning to assign thematic roles to the syntactic templates they are computing.

c) During online processing, advanced L2 learners and native Spanish speakers are sensitive to the interaction between word order and verb type, which I interpret to mean that they build syntactic templates and map thematic roles to them in real time. The thematic mapping is guided by predictions about the type of verb that will appear based on canonical alignments that maintain a

balance between syntactic and semantic prominence. The interaction between word order and verb type is more consistent in SVO conditions than in OVS conditions, the sensitivity to said interaction is sustained longer (i.e., into the second spillover region) among native speakers than advanced L2 learners.

(2) *Findings related to L1 English sentence production and processing*

a) In their offline language production, English speakers strongly prefer to complete subject-initial sentences with an action verb, and object-initial sentences with a Class III psych verb.

b) During online processing, L1 English speakers read subject-initial sentences faster when they contain an action verb as opposed to a psych verb. I interpret this to mean that they map the thematic role of agent to the first NP and predict that an action verb will appear, which aligns syntactic and semantic prominence. In object-initial sentences (OSV), English speakers are not sensitive to verb type, which suggests that their real-time predictions regarding what type of verb will appear are not as strong as in subject-initial sentences. Or, perhaps there is a confounding influence that affects processing in all object-initial sentences due their non-canonical status.

(3) *Findings related to subject interpretation in Spanish and English*

a) Beginner and intermediate L2 Spanish learners identify subject arguments more accurately in SVO conditions than in OVS conditions. The interaction between word order and verb type does not significantly affect their interpretation. In short, these learners strongly rely on word order, expecting the first noun to be the grammatical subject.

b) Advanced L2 learners identify grammatical subjects with similar accuracy across four conditions, showing no influence from either word order or verb type.

c) Native Spanish speakers identify subject arguments most accurately in the SVO/Action condition. They perform with stable accuracy in the other three conditions.

d) Advanced L2 learners and native Spanish speakers identify subject arguments more quickly in SVO sentences and sentences that contain action verbs.

e) Beginner L2 Spanish learners identify grammatical subjects more accurately in subject-initial sentences than in object-initial sentences. In their L1, English, they identify grammatical subjects with similar accuracy across all four conditions, whether subject-initial or object-initial.

2. Significance of Findings

2.1 Can L2 Learners become nativelike processors?

In this dissertation, three different levels of L2 learners were included, which has helped fill a void in what we know about the development of L2 sentence processing (Clahsen and Felser 2006; Jegerski and VanPatten 2013). Particularly, the highest proficiency levels have been understudied in L2 sentence processing (Keating 2017), which means that much of the support for the persistent non-native processing behavior predicted by the *Shallow Structure Hypothesis* (Clahsen and Felser 2006) has come from studies that examine non-advanced proficiencies (Keating 2017). When higher L2 proficiencies have been studied, upper-intermediate and advanced learners have often been mixed in one group, which does not allow for an understanding of how language

develops at the high end of the proficiency spectrum (see Keating 2017 for discussion). The group with the highest proficiency in the current work consisted of L2 learners with an average of 26.9 years of experience learning and speaking Spanish. Compare this with the average years of experience with Spanish in the most advanced group in Malovrh and Lee (2013)—11.65 years—which is still a considerable amount of experience per the standards of a typical L2 processing study. The present work, in conjunction with other research that has examined the L2 processing of morphosyntax at near-native proficiency levels (e.g., Jegerski 2010), has found that native-like processing is possible (see Chapter 2). The continued examination of this upper level of L2 attainment will be crucial as we continue to develop our understanding of how L2 processing develops.

The results from Chapter 2 revealed that beginner and intermediate L2 learners are most sensitive to changes in word order. To be precise, object-initial sentences cause a reading delay. In light of the results from the subject interpretation task in Chapter 4, the slower reading times in object-initial sentences might be most attributable to underdeveloped syntactic knowledge. These learners do not appear to have a syntactic mental representation for the object marker *a* which can be deployed during processing. Although they perceive the *a*, as evidenced by their slower reading times in object-initial sentences (Chapter 2), they do not know how to incorporate it into a syntactic template in order to consistently identify subjects in object-initial sentences (Chapter 4). The syntactic templates that beginner/intermediate L2 learners construct are also devoid of thematic relations, a conclusion drawn from that fact that changes in verb type (which is the source from which thematic relations are derived) do not significantly affect reading times. These learners do not appear to preemptively assign the first constituent a thematic

role based on word order and case, which results in an incomplete phase 2 processing in which syntactic and semantic prominence are aligned (Bornkessel and Schlewesky 2006; Gattei et al. 2015). In all tasks, beginner/intermediate L2 processing is non-nativelike.

If only beginning and intermediate L2 learners had been included in this research, it might have been tempting to conclude that L2 learners generally do not have the ability to map semantic-syntactic prominence to arguments in real time, but native Spanish speakers do. This result could have also been interpreted as support of the claim that L2 learners' processing is generally less detailed and less automatic than native speakers' (Clahsen and Felser 2006b). However, the results from the advanced L2 group revealed the importance of not drawing sweeping conclusions about L2 processing without considering the ability of L2 learners with very high proficiency. The advanced group showed sensitivity to the interaction between word order and verb type, like native speakers (Chapter 2). Instead of simply creating syntactic templates with word category information (e.g., NVN), advanced L2 learners were able to map thematic roles onto arguments in real time according to canonical syntactic-semantic alignments. Based on their behavior, it appears they used word order and case cues to predict what type of verb (psych vs. action) would appear; this explains why it was specifically at the verbal region (i.e., the two post-verbal spillover regions) where effects were recorded. If the predicted verb type appeared, processing was easier than if an unexpected verb type appeared, although this effect was more apparent in SVO conditions. The relative processing delay for unexpected verb types is interpreted as a reanalysis of the phase 2 computations related to thematic prominence of arguments (Bornkessel and Schlesewsky 2006).

2.2 Is L2 Processing Influenced by L1 Processing or Knowledge?

Contrary to what might be expected based on L2 researchers' characterizations of English as a strict SVO language that only maps thematic roles on an SVO template (e.g., Pascual y Cabo 2013), the results from Chapter 3 show that native English speakers share some of the same intuitions as native Spanish speakers. When English speakers are presented with a subject-initial sentence frame, they prefer to complete it with an action verb. When presented with an object-initial sentence frame, they prefer to complete it with a psych verb. This distribution was also found in a Spanish sentence completion task (Gattei et al. 2017), and the link between object-initial sentences and psych verbs is similarly active in German (Bornkessel and Schlesewsky 2003). This crosslinguistic pattern indicates that a similar syntactic-semantic hierarchy guides the arrangement of core arguments in English, Spanish, and German. The self-paced reading task in Chapter 3 provided additional evidence that English speakers are guided by word order/verb type canonicity. At the verbal region, they more quickly processed the canonical SVO/Action condition than the non-canonical SVO/psych condition. This is interpreted to mean that English speakers, like Spanish speakers, map thematic roles to arguments in real time and make predictions about the type of verb that will appear based on canonical syntactic-semantic alignment of prominence.

The within-participant crosslinguistic subject-identification task (Chapter 4) revealed additional crosslinguistic performance congruity between English and Spanish. First, English speakers, like Spanish speakers appear to have a fundamental understanding of dative case and can use object markers to identify subject and object arguments in multiple word orders. Additionally, English speakers appear to have a

fundamental understanding of Class III psych verbs and their relationship with subject-initial and object-initial word orders. Therefore, L1 English speakers' difficulties with these concepts in L2 Spanish at the beginner and intermediate levels do not appear to be caused by a lack of similar linguistic knowledge in their L1. Instead, L2 learners' unsuccessful subject identification in Spanish dative sentences might be due to a failure to process *a* with its correct function as dative object marker. Due to the multi-functionality of *a* in Spanish, it is an unreliable cue for L2 learners (MacWhinney and Bates 1989). It is important to consider that non-native performance in an L2 can be caused by many factors, including (but not limited to) L1 transfer, universal tendencies, inefficient processing, or a failure to properly identify the function of L2 cues. In future L2 research, it will be important to continue teasing apart these different factors through balanced research.

With the available evidence, it is not possible to provide a definitive answer as to whether L1 English directly influences L2 Spanish processing. Recall that this work was a preliminary examination of this topic because it included only one of three tests of language transfer: crosslinguistic performance congruity (Jarvis and Pavlenko 2008). Still, the results challenge the status quo in L2 Spanish research, in which L1 English has often been discussed from a deficit perspective or as source of interference in the L2 acquisition of Spanish. For example, it has been assumed that L1 English knowledge cannot conceivably guide L2 Spanish learners' acquisition of the interaction between word order and verb type with psych verbs (Gómez Soler 2015). Additionally, the common wisdom has been that English either has no Class III psych verbs or that they only exist in formal language usage (Montrul 1998; Gómez Soler 2010), and that English

lacks dative marking (Kanwit and Lubbers Quesada 2017; Montrul 1998). These assumptions may have led researchers to avoid exploring possible crosslinguistic similarity between English and Spanish through empirical analysis. Without experimental L1 data, it is difficult to theorize about possible transfer effects between languages (Hitz and Francis 2016).

The conclusion from the present work regarding L1 English influence in L2 Spanish processing is the following: there is more crosslinguistic performance congruity between English and Spanish at the intersection of word order and verb type than has been assumed, so English should not be considered a source of negative L1 transfer without experimental evidence. We still have much work to do in order to tease apart potential universal forces (e.g., The First Noun Principle; VanPatten 2007) from language specific forces (e.g., The L1 Transfer Principle; VanPatten 2007) in L2 processing. We should explore creative ideas regarding how to examine crosslinguistic patterns between two languages even when they appear to be quite different. For example, although English does not have a highly flexible word order, I exploited the one systematic non-SVO word order in English (OSV) order to compare subject-initial patterns with object-initial patterns in English, which I in turn compared with subject-initial and object-initial patterns in Spanish. Although the specific object-initial patterns were different between English and Spanish (OSV vs. OVS), I framed the crosslinguistic comparisons within theory (Belletti and Rizzi 1998; Bornkessel and Schlesewsky 2006; Givón 1984) in which the subject initial vs. object initial contrast was more relevant than the specific constituent order.

3. Limitations and Future Directions

One of the limitations in the present study concerns the cross-sectional design based on proficiency. Although the participants were referred to as beginner, intermediate, and advanced L2 learners, the difference in proficiency between the groups was not even. For example, the gap in proficiency between the beginner and intermediate learners was smaller than the gap between the intermediate and advanced learners. Therefore, although it was determined that advanced L2 learners are capable of native-like processing in some of the contexts examined, it is not completely clear at what proficiency this occurs. Including a group that has a proficiency beyond that of the average undergraduate majoring/minoring in Spanish but less than that of the average postgraduate with an MA or PhD in Hispanic studies would be revealing.

Another limitation is related to methodology. SPR can be unnatural for some participants since they are not allowed to *regress* (i.e., go back) to previous parts of the sentence once they move onto a new segment. In natural reading, we regress to previously read parts of sentences quite often. For example, in eye-tracking experiments, which allow participants to freely read entire sentences, regressions account for approximately 15% of total eye movements (Jegerski 2014). Because of the more restrictive nature of SPR and the greater processing load it may induce, the interaction between word order and verb type in L2 Spanish and L1 English should be examined with additional psycholinguistic methods, such as eye-tracking and EEG.

Moving forward, the concept of canonicity will need to be explored in greater detail because certain canonical patterns seem to affect processing more than others. For instance, while multiple tasks showed that the processing load of the non-canonical

SVO/psych was greater than that of the canonical SVO/action in Spanish, there was a reduced or absent contrast between the canonical and non-canonical object-initial patterns, namely OVS/psych and OVS/action (Chapter 2). A similar pattern was found in English: the difference in reading times between the subject-initial conditions (SVO/action and SVO/psych) was significant, but this was not true between the object-initial conditions (OSV/psych and OSV/action). As explained in Chapter 3, the effects of word order/verb type canonicity that are apparent in language production (e.g., sentence completion tasks) might be obscured in online processing due to a general processing disadvantage for all object-initial sentences (Bornkessel and Schlesewsky 2006), or even by a different neural mechanism (Gattei et al. 2015b).

Another factor to consider in future work is frequency. The reader will recall that the SVO/action pattern was particularly easy to process for both Spanish and English speakers, which was argued to be a result of aligned syntactic/semantic prominence. However, in part, SVO/action may also facilitate processing because (1) SVO is the most common word order in Spanish and English (Dryer 2013), and (2) action verbs outnumber psych verbs (which is true in all languages). SVO/action provides the perfect convergence of factors related to frequency and argument alignment. Additional factors that intersect with both word order and verb type will need to be examined in future studies.

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Appendix A

Items from Spanish SPR Task (Chapter 2)

*****There are four conditions per item. The lines with the "?" symbol are the comprehension questions for each target sentence. The 'C' and 'F' are abbreviations of *cierto* 'true' and *falso* 'false'; they indicate the correct answer to comprehension questions.

1
a. Brenda le canta a Carmen y no entiende la razón.
? Las dos personas entienden la razón. F
b. Brenda le interesa a Carmen y no entiende la razón.
? Las dos personas entienden la razón. F
c. A Brenda le canta Carmen y no entiende la razón.
? Las dos personas entienden la razón. F
d. A Brenda le interesa Carmen y no entiende la razón.
? Las dos personas entienden la razón. F

2
a. Vicente le canta a Ignacio pero no puede explicar por qué.
? Una chica no puede explicar algo. F
b. Vicente le interesa a Ignacio pero no puede explicar por qué.
? Una chica no puede explicar algo. F
c. A Vicente le canta Ignacio pero no puede explicar por qué.
? Una chica no puede explicar algo. F
d. A Vicente le interesa Ignacio pero no puede explicar por qué.
? Una chica no puede explicar algo. F

3
a. Beatriz le roba a Camila porque ella es una mala persona.
? La mala persona es un chico. F
b. Beatriz le disgusta a Camila porque ella es una mala persona.
? La mala persona es un chico. F
c. A Beatriz le roba Camila porque ella es una mala persona.
? La mala persona es un chico. F
d. A Beatriz le disgusta Camila porque ella es una mala persona.
? La mala persona es un chico. F

4
a. Rico le roba a Marcos pero no tiene vergüenza.
? Dos personas tienen vergüenza. F
b. Rico le disgusta a Marcos pero no tiene vergüenza.
? Dos personas tienen vergüenza. F
c. A Rico le roba Marcos pero no tiene vergüenza.
? Dos personas tienen vergüenza. F

d. A Rico le disgusta Marcos pero no tiene vergüenza.
? Dos personas tienen vergüenza. F

5
a. Débora le grita a Laura sin un motivo muy claro.
? Los motivos de las dos chicas están claros. F
b. Débora le gusta a Laura sin un motivo muy claro.
? Los motivos de las dos chicas están claros. F
c. A Débora le grita Laura sin un motivo muy claro.
? Los motivos de las dos chicas están claros. F
d. A Débora le gusta Laura sin un motivo muy claro.
? Los motivos de las dos chicas están claros. F

6
Damián le grita a Ernesto y se comporta de manera rara.
? Tres personas se comportan de manera rara. F
Damián le gusta a Ernesto y se comporta de manera rara.
? Tres personas se comportan de manera rara. F
A Damián le grita Ernesto y se comporta de manera rara.
? Tres personas se comportan de manera rara. F
A Damián le gusta Ernesto y se comporta de manera rara.
? Tres personas se comportan de manera rara. F

7
a. María le responde a Ana porque siempre fue muy amable.
? Alguien siempre fue antipática. F
b. María le encanta a Ana porque siempre fue muy amable.
? Alguien siempre fue antipática. F
c. A María le responde Ana porque siempre fue muy amable.
? Alguien siempre fue antipática. F
d. A Maria le encanta Ana porque siempre fue muy amable.
? Alguien siempre fue antipática. F

8
a. Alfredo le responde a Carlos aunque por mucho tiempo no se llevaron bien.
? Dos chicos se hicieron amigos inmediatamente. F
b. Alfredo le encanta a Carlos aunque por mucho tiempo no se llevaron bien.
? Dos chicos se hicieron amigos inmediatamente. F
c. A Alfredo le responde Carlos aunque por mucho tiempo no se llevaron bien.
? Dos chicos se hicieron amigos inmediatamente. F
d. A Alfredo le encanta Carlos aunque por mucho tiempo no se llevaron bien.
? Dos chicos se hicieron amigos inmediatamente. F

9
a. Sofía le enseña a Ester ya que es su hija favorita.

? La hija es la menos preferida de la madre. F
b. Sofía le importa a Ester ya que es su hija favorita.
? La hija es la menos preferida de la madre. F
c. A Sofía le enseña Ester ya que es su hija favorita.
? La hija es la menos preferida de la madre. F
d. A Sofía le importa Ester ya que es su hija favorita.
? La hija es la menos preferida de la madre. F

10
a. Samuel le enseña a Raúl y por eso pasan mucho tiempo juntos.
? Las dos personas se ven poco. F
b. Samuel le importa a Raúl y por eso pasan mucho tiempo juntos.
? Las dos personas se ven poco. F
c. A Samuel le enseña Raúl y por eso pasan mucho tiempo juntos.
? Las dos personas se ven poco. F
d. A Samuel le importa Raúl y por eso pasan mucho tiempo juntos.
? Las dos personas se ven poco. F

11
Julieta le miente a Estela aunque ella no se da cuenta.
? Un chico no se da cuenta de algo. F
Julieta le fascina a Estela aunque ella no se da cuenta.
? Un chico no se da cuenta de algo. F
A Julieta le miente Estela aunque ella no se da cuenta.
? Un chico no se da cuenta de algo. F
A Julieta le fascina Estela aunque ella no se da cuenta.
? Un chico no se da cuenta de algo. F

12
a. Gerardo le miente a Víctor pero nadie lo sabe excepto la maestra.
? Todos saben el secreto. F
b. Gerardo le fascina a Víctor pero nadie lo sabe excepto la maestra.
? Todos saben el secreto. F
c. A Gerardo le miente Víctor pero nadie lo sabe excepto la maestra.
? Todos saben el secreto. F
d. A Gerardo le fascina Víctor pero nadie lo sabe excepto la maestra.
? Todos saben el secreto. F

13
a. Claudia le cocina a Vivian porque no sabe cocinar muy bien.
? Una chica no cocina bien. C
b. Claudia le divierte a Vivian porque no sabe cocinar muy bien.
? Una chica no cocina bien. C
c. A Claudia le cocina Vivian porque no sabe cocinar muy bien.
? Una chica no cocina bien. C

d. A Claudia le divierte Vivian porque no sabe cocinar muy bien.
? Una chica no cocina bien. C

14
a. Cristián le cocina a Álvaro cuando lo cuida por la mañana.
? Una persona cuida a otra persona. C
b. Cristián le divierte a Álvaro cuando lo cuida por la mañana.
? Una persona cuida a otra persona. C
c. A Cristián le cocina Álvaro cuando lo cuida por la mañana.
? Una persona cuida a otra persona. C
d. A Cristián le divierte Álvaro cuando lo cuida por la mañana.
? Una persona cuida a otra persona. C

15
a. Andrea le habla a Catalina ahora que tiene una enfermedad incurable.
? Alguien tiene una grave enfermedad. C
b. Andrea le deprime a Catalina ahora que tiene una enfermedad incurable.
? Alguien tiene una grave enfermedad. C
c. A Andrea le habla Catalina ahora que tiene una enfermedad incurable.
? Alguien tiene una grave enfermedad. C
d. A Andrea le deprime Catalina ahora que tiene una enfermedad incurable.
? Alguien tiene una grave enfermedad. C

16
a. Fabio le habla a Gabriel dado que tiene pocos amigos.
? Alguien no tiene muchos amigos. C
b. Fabio le deprime a Gabriel dado que tiene pocos amigos.
? Alguien no tiene muchos amigos. C
c. A Fabio le habla Gabriel dado que tiene pocos amigos.
? Alguien no tiene muchos amigos. C
d. A Fabio le deprime Gabriel dado que tiene pocos amigos.
? Alguien no tiene muchos amigos. C

17
a. Juana le llora a Carlos desde que perdió un ojo.
? Alguien tiene un solo ojo. C
b. Juana le asusta a Carlos desde que perdió un ojo.
? Alguien tiene un solo ojo. C
c. A Juana le llora Carlos desde que perdió un ojo.
? Alguien tiene un solo ojo. C
d. A Juana le asusta Carlos desde que perdió un ojo.
? Alguien tiene un solo ojo. C

18
a. Jorge le llora a Diego y por esa razón ya no son amigos.

? Los dos chicos no son amigos ahora. C
b. Jorge le asusta a Diego y por esa razón ya no son amigos.
? Los dos chicos no son amigos ahora. C
c. A Jorge le llora Diego y por esa razón ya no son amigos.
? Los dos chicos no son amigos ahora. C
d. A Jorge le asusta Diego y por esa razón ya no son amigos.
? Los dos chicos no son amigos ahora. C

19
a. Tatiana le sonríe a Lucila puesto que es una buena persona.
? Alguien es una buena persona. C
b. Tatiana le impresiona a Lucila puesto que es una buena persona.
? Alguien es una buena persona. C
c. A Tatiana le sonríe Lucila puesto que es una buena persona.
? Alguien es una buena persona. C
d. A Tatiana le impresiona Lucila puesto que es una buena persona.
? Alguien es una buena persona. C

20
a. Ramiro le sonríe a Daniel pero sus padres no entienden por qué.
? Una persona confunde a sus padres. C
b. Ramiro le impresiona a Daniel pero sus padres no entienden por qué.
? Una persona confunde a sus padres. C
c. A Ramiro le sonríe Daniel pero sus padres no entienden por qué.
? Una persona confunde a sus padres. C
d. A Ramiro le impresiona Daniel pero sus padres no entienden por qué.
? Una persona confunde a sus padres. C

21
a. Carolina le escribe a Teresa cuando no sabe qué hacer.
? Una chica no sabe qué hacer a veces. C
b. Carolina le aburre a Teresa cuando no sabe qué hacer.
? Una chica no sabe qué hacer a veces. C
c. A Carolina le escribe Teresa cuando no sabe qué hacer.
? Una chica no sabe qué hacer a veces. C
d. A Carolina le aburre Teresa cuando no sabe qué hacer.
? Una chica no sabe qué hacer a veces. C

22
a. Andrés le escribe a Felipe desde que tuvo un bebé.
? Una de las personas es padre ahora. C
b. Andrés le aburre a Felipe desde que tuvo un bebé.
? Una de las personas es padre ahora. C
c. A Andrés le escribe Felipe desde que tuvo un bebé.
? Una de las personas es padre ahora. C

d. A Andrés le aburre Felipe desde que tuvo un bebé.
? Una de las personas es padre ahora. C

23
a. Elisa le contesta a Olivia cuando están trabajando en clase.
? Las dos personas están en la misma clase. C
b. Elisa le enoja a Olivia cuando están trabajando en clase.
? Las dos personas están en la misma clase. C
c. A Elisa le contesta Olivia cuando están trabajando en clase.
? Las dos personas están en la misma clase. C
d. A Elisa le enoja Olivia cuando están trabajando en clase.
? Las dos personas están en la misma clase. C

24
a. Rodrigo le contesta a Adrián siempre que hace una pregunta estúpida.
? La persona que hace preguntas estúpidas es un chico. C
b. Rodrigo le enoja a Adrián siempre que hace una pregunta estúpida.
? La persona que hace preguntas estúpidas es un chico. C
c. A Rodrigo le contesta Adrián siempre que hace una pregunta estúpida.
? La persona que hace preguntas estúpidas es un chico. C
d. A Rodrigo le enoja Adrián siempre que hace una pregunta estúpida.
? La persona que hace preguntas estúpidas es un chico. C

filler 1
Eduardo le ofreció un dólar a Felipe pero no lo aceptó.
? Alguien le ofreció un dólar a otra persona. C

filler 2
Alberto le dio un beso a Héctor en la fiesta cuando nadie miraba.
? Un chico le dio un beso a alguien. C

filler 3
Viviana le pidió disculpas a Verónica justo después de la cita.
? Dos personas tuvieron una cita. C

filler 4
Sara le llevó un pastel a Lorena cuando la visitó en agosto.
? Alguien le llevó un pastel a otra persona. C

filler 5
Manuel le tiró el balón a Paco durante el partido de fútbol americano.
? Alguien tiró un balón. C

filler 6
Melinda le trajo una pizza a Rita porque tenía mucha hambre.

? Una de las chicas tenía hambre. C

filler 7
Sandro le dijo la verdad a Raquel aunque era obvio que no lo iba a creer.
? Alguien dijo una mentira. F

filler 8
Rubén le mandó una carta a Javier porque no quería hablar con él en persona.
? Una chica mandó algo. F

filler 9
Pedro le mostró el documento a Romeo antes de imprimirlo.
? Dos personas le mostraron un documento a alguien. F

filler 10
Miguel le tomó una foto a José con la intención de subirla a Facebook.
? Alguien quería subir una foto a Instagram. F

filler 11
Paola le envió un email a Maite mientras veía una telenovela mexicana.
? Una persona veía una telenovela colombiana. F

filler 12
Carla le contó un chiste a Nora pero la maestra las escuchó y se enojó.
? Un chico contó un chiste. F

filler 13
A Bernarda le pasó la pelota Martina pero no pudo meter un gol.
? Una chica no metió un gol. C

filler 14
A Martín le preparó un sándwich Joaquín aunque no lo había pedido.
? Una persona preparó un sándwich. C

filler 15
A Emilio le hizo un favor Hugo ya que es una persona amable.
? La persona amable es un chico. C

filler 16
A Lucas le prestó un carro Gonzalo para que pudiera ir a Texas.
? Alguien quería ir a Texas. C

filler 17
A Iván le explicó el problema Bruno aunque no lo quería hacer.

? Una persona no quería explicar algo. C

filler 18
A Carlota le vendió una bicicleta Eva y ahora la usa todos los días.
? La bicicleta se usa todos los días. C

filler 19
A Clara le sacó la lengua Alexia para burlarse de ella.
? Alguien sacó su lengua. F

filler 20
A Julio le criticó el ensayo Agustín después de leerlo.
? Una chica criticó algo. F

filler 21
A Rosa le devolvió el libro Vanesa después de usarlo para una clase.
? Alguien devolvió una revista. F

filler 22
A Josué le puso agua bendita Ramón cuando entró en la iglesia.
? Algo pasó en un hospital. F

filler 23
A Josefa le compró un regalo Guadalupe para el día de San Valentín.
? Tres personas compraron un regalo. F

filler 24
A Óscar le quitó el reloj Enrique porque el suyo se rompió ayer.
? Dos personas le quitaron el reloj a alguien. F

filler 25
Ricardo quiere viajar por España y Francia pero no quiere ir a Asia.
? Ricardo quiere ir a China. F

filler 26
Carlitos es bastante activo, pero odia los deportes acuáticos.
? Carlitos tiende a hacer surf. F

filler 27
Manolo toma muchos jugos y refrescos pero poco café.
? Manolo toma más café que jugo. F

filler 28
El profesor favorito de Lucero es el Sr. García porque le puso una A.
? El Sr. García le puso una mala nota a Lucero. F

filler 29
En el zoológico hay 4 gorilas, 3 elefantes, pero solo 2 canguros.
? Hay más elefantes que gorilas en el zoológico. F

filler 30
Como su padre fue un alcohólico, Matías nunca toma bebidas alcohólicas.
? Matías toma alcohol a veces. F

filler 31
La Gomera es una de las siete islas principales de las Islas Canarias.
? Canarias se compone de cinco islas. F

filler 32
María Olvido Gara Jova, más conocida como Alaska, nació en México.
? Alaska nació en Europa. F

filler 33
Maribel tiene cuatro conejos blancos en su jardín grande.
? Maribel tiene más de tres conejos blancos. C

filler 34
Dos hombres franceses fueron al mercado para comprar una cebolla.
? Los hombres franceses compraron una verdura. C

filler 35
La madre de Regina hace un pastel cada miércoles por la tarde.
? La madre de Regina hace un pastel cada semana. C

filler 36
Alonso dijo que la película que acababa de ver era bastante aburrida.
? Alonso tiene una opinión negativa de la película. C

filler 37
Maricarmen y su novio fueron al parque para ver los patitos recién nacidos.
? Alguien fue al parque para ver animales. C

filler 38
La gastronomía de Nueva Orleans representa la fusión de varias culturas.
? La comida de Nueva Orleans tiene influencia de múltiples culturas. C

filler 39
El castellano es la lengua materna del 82% de los españoles.
? La mayoría de los españoles habla castellano. C

filler 40
España estuvo bajo la dictadura de Franco hasta su muerte en 1975.
? Franco murió en 1975. C

Appendix B

Items from English SPR task (Chapter 3)

1
a. Steve waved happily and eagerly to John at the high school reunion last Thursday.
? Was it last Wednesday when the high school reunion took place? N
b. Steve appeared wrinkly and old to John at the high school reunion last Thursday.
? Was it last Wednesday when the high school reunion took place? N
c. To John, Steve waved happily and eagerly at the high school reunion last Thursday.
? Was it last Wednesday when the high school reunion took place? N
d. To John, Steve appeared wrinkly and old at the high school reunion last Thursday.
? Was it last Wednesday when the high school reunion took place? N

2
a. Wendy waved excitedly and gleefully to Emma in the black and white photo on her desk.
? Was the photo in full color? N
b. Wendy appeared a bit older to Emma in the black and white photo on her desk.
? Was the photo in full color? N
c. To Emma, Wendy waved excitedly and gleefully in the black and white photo on her desk.
? Was the photo in full color? N
d. To Emma, Wendy appeared a bit older in the black and white photo on her desk.
? Was the photo in full color? N

3
a. Logan waved quickly and cheerfully to Harry from his hospital bed in the recovery wing.
? Was it a hospital bed that Logan was in? Y
b. Logan appeared sickly and decrepit to Harry from his hospital bed in the recovery wing.
? Was it a hospital bed that Logan was in? Y
c. To Harry, Logan waved quickly and cheerfully from his hospital bed in the recovery wing.
? Was it a hospital bed that Logan was in? Y
d. To Harry, Logan appeared sickly and decrepit from his hospital bed in the recovery wing.
? Was it a hospital bed that Logan was in? Y

4
a. Madison waved a bit timidly to Amber in her grotesque costume at the Halloween bash.
? Was it at the Halloween party that Madison was dressed up? Y

b. Madison appeared horrifying and monstrous to Amber in her grotesque costume at the Halloween bash.
? Was it at the Halloween party that Madison was dressed up? Y
c. To Amber, Madison waved a bit timidly in her grotesque costume at the Halloween bash.
? Was it at the Halloween party that Madison was dressed up? Y
d. To Amber, Madison appeared horrifying and monstrous in her grotesque costume at the Halloween bash.
? Was it at the Halloween party that Madison was dressed up? Y

5
a. Jason ran quickly and gracefully to Alex because they knew each other really well.
? Were the two people unacquainted? N
b. Jason seemed friendly and polite to Alex because they knew each other really well.
? Were the two people unacquainted? N
c. To Alex, Jason ran quickly and gracefully because they knew each other really well.
? Were the two people unacquainted? N
d. To Alex, Jason seemed friendly and polite because they knew each other very well.
? Were the two people unacquainted? N

6
a. Grace ran with open arms to Kayla as she displayed her huge smile and gentle eyes.
? Was Grace's smile small and sickly? N
b. Grace seemed actually quite approachable to Kayla as she displayed her huge smile and gentle eyes.
? Was Grace's smile small and sickly? N
c. To Kayla, Grace ran with open arms as she bared her huge smile and displayed her gentle eyes.
? Was Grace's smile small and sickly? N
d. To Kayla, Grace seemed actually quite approachable as she displayed her huge smile and gentle eyes.
? Was Grace's smile small and sickly? N

7
a. Ralph ran swiftly and deliberately to Dylan with his towel cape dangling behind him.
? Was it a towel cape that Ralph was wearing? Y
b. Ralph seemed silly and childish to Dylan with his towel cape dangling behind him.
? Was it a towel cape that Ralph was wearing? Y
c. To Dylan, Ralph ran swiftly and deliberately with his towel cape dangling behind him.
? Was it a towel cape that Ralph was wearing? Y
d. To Dylan, Ralph seemed silly and childish with his towel cape dangling behind him.
? Was it a towel cape that Ralph was wearing? Y

8

a. Megan ran a bit recklessly to Heather on the outdoor track as she ignored her surroundings.
? Was it the outdoor track that Megan was on? Y
b. Megan seemed like a jerk to Heather on the outdoor track as she ignored her surroundings.
? Was it the outdoor track that Megan was on? Y
c. To Heather, Megan ran a bit recklessly on the outdoor track as she ignored her surroundings.
? Was it the outdoor track that Megan was on? Y
d. To Heather, Megan seemed like a jerk on the outdoor track as she ignored her surroundings.
? Was it the outdoor track that Megan was on? Y

9
Ryan whispered secretly and mischievously to Ben even though they had not known each other for very long.
? Had the two people known each other for a long time? N
Ryan mattered a whole lot to Ben even though they had not known each other for very long.
? Had the two people known each other for a long time? N
To Ben, Ryan whispered secretly and mischievously even though they had not known each other for very long.
? Had the two people known each other for a long time? N
To Ben, Ryan mattered a whole lot even though they had not known each other for very long.
? Had the two people known each other for a long time? N

10
Courtney whispered softly and discreetly to Michelle because they shared a really intriguing secret.
? Was Courtney and Michelle's secret dull and boring? N
Courtney mattered quite a bit to Michelle because they shared a really intriguing secret.
? Was Courtney and Michelle's secret dull and boring? N
To Michelle, Courtney whispered softly and discreetly because they shared a really intriguing secret.
? Was Courtney and Michelle's secret dull and boring? N
To Michelle, Courtney mattered quite a bit because they shared a really intriguing secret.
? Was Courtney and Michelle's secret dull and boring? N

11
a. Dennis whispered in slurred speech to Jeremy after their bonding experience of doing lots of birthday shots.
? Was it birthday shots that led to Dennis and Jeremy bonding? Y
b. Dennis mattered profoundly and sincerely to Jeremy after their bonding experience of doing lots of birthday shots.

? Was it birthday shots that led to Dennis and Jeremy bonding? Y
c. To Jeremy, Dennis whispered in slurred speech after their bonding experience of doing lots of birthday shots.
? Was it birthday shots that led to Dennis and Jeremy bonding? Y
d. To Jeremy, Dennis mattered profoundly and sincerely after their bonding experience of doing lots of birthday shots.
? Was it birthday shots that led to Dennis and Jeremy bonding? Y

12
a. Sharon whispered with great affection to Nicole after her bridesmaid speech at Sharon's wedding.
? Was it a bridesmaid speech that Nicole gave at Sharon's wedding? Y
Sharon mattered more than anything to Nicole after her bridesmaid speech at Sharon's wedding.
? Was it a bridesmaid speech that Nicole gave at Sharon's wedding? Y
To Nicole, Sharon whispered with great affection after her bridesmaid speech at Sharon's wedding.
? Was it a bridesmaid speech that Nicole gave at Sharon's wedding? Y
To Nicole, Sharon mattered more than anything after her bridesmaid speech at Sharon's wedding.
? Was it a bridesmaid speech that Nicole gave at Sharon's wedding? Y

13
a. Andrew called loudly and powerfully to Bill at the party last weekend.
? Is it next weekend when the party will take place? N
b. Andrew smelled fresh and clean to Bill at the party last weekend.
? Is it next weekend when the party will take place? N
c. To Bill, Andrew called loudly and powerfully at the party last weekend.
? Is it next weekend when the party will take place? N
d. To Bill, Andrew smelled fresh and clean at the party last weekend.
? Is it next weekend when the party will take place? N

14
a. Erin called longingly and warmly to Allison when they met up after such a long time.
? Did the two people meet up after a short amount of time? N
b. Erin smelled surprisingly quite good to Allison when they met up after such a long time.
? Did the two people meet up after a short amount of time? N
c. To Allison, Erin called longingly and warmly when they met up after such a long time.
? Did the two people meet up after a short amount of time? N
d. To Allison, Erin smelled surprisingly quite good when they met up after such a long time.
? Did the two people meet up after a short amount of time? N

15

a. Thomas called enthusiastically and boldly to Jeffrey during the soccer game at the park.
? Was it a soccer game that took place at the park? Y
b. Thomas smelled vaguely of alcohol to Jeffrey during the soccer game at the park.
? Was it a soccer game that took place at the park? Y
c. To Jeffrey, Thomas called enthusiastically and boldly during the soccer game at the park.
? Was it a soccer game that took place at the park? Y
d.To Jeffrey, Thomas smelled vaguely of alcohol during the soccer game at the park.
? Was it a soccer game that took place at the park?. Y

16
Judy called hopelessly and shakily to Betty after the spill in the science lab.
? Did the spill take place in a laboratory? Y
Judy smelled like toxic chemicals to Betty after the spill in the science lab.
? Did the spill take place in a laboratory? Y
To Betty, Judy called hopelessly and shakily after the spill in the science lab.
? Did the spill take place in a laboratory? Y
To Betty, Judy smelled like toxic chemicals after the spill in the science lab.
? Did the spill take place in a laboratory? Y

17
a. Noah replied sharply and crudely to Aaron during their recent Skype call.
? Was the call made on a landline phone? N
b. Noah sounded lonely and sad to Aaron during their recent Skype call.
? Was the call made on a landline phone? N
c. To Aaron, Noah replied sharply and crudely during their recent Skype call.
? Was the call made on a landline phone? N
d. To Aaron, Noah sounded lonely and sad during their recent Skype call.
? Was the call made on a landline phone? N

18
a. Molly replied punctually and professionally to Melissa during the conference call this morning.
? Was it this afternoon when the two people communicated? N
b. Molly sounded a little hoarse to Melissa during the conference call this morning.
? Was it this afternoon when the two people communicated? N
c. To Melissa, Molly replied punctually and professionally during the conference call this morning.
? Was it this afternoon when the two people communicated? N
d. To Melissa, Molly sounded a little hoarse during the conference call this morning.
? Was it this afternoon when the two people communicated? N

19
a. Randy replied obnoxiously and irritably to Austin when he found out the terrible news.

? Was it terrible news that someone found out? Y
b. Randy sounded upset and scared to Austin when he found out the terrible news.
? Was it terrible news that someone found out? Y
c. To Austin, Randy replied obnoxiously and irritably when he found out the terrible news.
? Was it terrible news that someone found out? Y
d. To Austin, Randy sounded upset and scared when he found out the terrible news.
? Was it terrible news that someone found out? Y

20
a. Hannah replied impatiently and frankly to Teresa while talking on the phone yesterday.
? Was it yesterday when the phone call took place? Y
b. Hannah sounded melancholy and tired to Teresa while talking on the phone yesterday.
? Was it yesterday when the phone call took place? Y
c. To Teresa, Hannah replied impatiently and frankly while talking on the phone yesterday.
? Was it yesterday when the phone call took place? Y
d. To Teresa, Hannah sounded melancholy and tired while talking on the phone yesterday.
? Was it yesterday when the phone call took place? Y

21
a. Blake talked calmly and precisely to Lucas while standing in the doorway.
? Was anyone sitting in the doorway? N
b. Blake looked ugly and unkempt to Lucas while standing in the doorway.
? Was anyone sitting in the doorway? N
c. To Lucas, Blake talked calmly and precisely while standing in the doorway.
? Was anyone sitting in the doorway? N
d. To Lucas, Blake looked ugly and unkempt while standing in the doorway.
? Was anyone sitting in the doorway? N

22
a. Breanna talked for several minutes to Leah during the high-stakes interview.
? Was it a low-pressure interview that the people participated in? N
b. Breanna looked confident and prepared to Leah during the high-stakes interview.
? Was it a low-pressure interview that the people participated in? N
c. To Leah, Breanna talked for several minutes during the high-stakes interview.
? Was it a low-pressure interview that the people participated in? N
d. To Leah, Breanna looked confident and prepared during the high stakes interview.
? Was it a low-pressure interview that the people participated in? N

23
a. Bruce talked gleefully and hastily to Harry at the speed-dating event last night.
? Was it a speed-dating event that took place? Y
b. Bruce looked handsome and stylish to Harry at the speed-dating event last night.

? Was it a speed-dating event that took place? Y
c. To Harry, Bruce talked gleefully and hastily at the speed-dating event last night.
? Was it a speed-dating event that took place? Y
d. To Harry, Bruce looked handsome and stylish at the speed-dating event last night.
? Was it a speed-dating event that took place? Y

24
a. Kelly talked sincerely and openly to Marie at the Alcoholics Anonymous meeting over the weekend.
? Was it an Alcoholics Anonymous meeting that the two people attended? Y
b. Kelly looked pale and malnourished to Marie at the Alcoholics Anonymous meeting over the weekend.
? Was it an Alcoholics Anonymous meeting that the two people attended? Y
c. To Marie, Kelly talked sincerely and openly at the Alcoholics Anonymous meeting over the weekend.
? Was it an Alcoholics Anonymous meeting that the two people attended? Y
d. To Marie, Kelly looked pale and malnourished at the Alcoholics Anonymous meeting over the weekend.
? Was it an Alcoholics Anonymous meeting that the two people attended? Y

25
a. Patrick spoke slowly and carefully to Connor as they shook hands at the awards ceremony.
? Did the two people give each other a high five? N
b. Patrick felt chilly and clammy to Connor as they shook hands at the awards ceremony.
? Did the two people give each other a high five? N
c. To Connor, Patrick spoke slowly and carefully as they shook hands at the awards ceremony.
? Did the two people give each other a high five? N
d. To Connor, Patrick felt chilly and clammy as they shook hands at the awards ceremony.
? Did the two people give each other a high five? N

26
a. Linda spoke briefly and urgently to Mary as they waited for the ambulance to arrive.
? Was it a mail truck that the people were waiting for? N
b. Linda felt cold and sweaty to Mary as they waited for the ambulance to arrive.
? Was it a mail truck that the people were waiting for? N
c. To Mary, Linda spoke briefly and urgently as they waited for the ambulance to arrive.
? Was it a mail truck that the people were waiting for? N
d. To Mary, Linda felt cold and sweaty as they waited for the ambulance to arrive.
? Was it a mail truck that the people were waiting for? N

27
a. Douglas spoke patiently and clearly to Jerry as they held each other at the wedding.

? Was it at a wedding that the two people embraced each other? Y
b. Douglas felt warm and cuddly to Jerry as they held each other at the wedding.
? Was it at a wedding that the two people embraced each other? Y
c. To Jerry, Douglas spoke patiently and clearly as they held each other at the wedding.
? Was it at a wedding that the two people embraced each other? Y
d. To Jerry, Douglas felt warm and cuddly as they held each other at the wedding.
? Was it at a wedding that the two people embraced each other? Y

28
a. Cindy spoke lovingly and elegantly to Heidi when they held hands one summer night.
? Was it during the summer that the two people held hands? Y
b. Cindy felt hot and sticky to Heidi when they held hands one summer night.
? Was it during the summer that the two people held hands? Y
c. To Heidi, Cindy spoke lovingly and elegantly when they held hands one summer night.
? Was it during the summer that the two people held hands? Y
d. To Heidi, Cindy felt hot and sticky when they held hands one summer night.
? Was it during the summer that the two people held hands? Y

29
a. Pater sang a grateful ditty to Nick because he helped him start his new band.
? Was it a church choir that someone helped start? N
b. Peter meant the whole world Nick because he helped him start his new band.
? Was it a church choir that someone helped start? N
c. To Nick, Peter sang a grateful ditty because he helped him start his new band.
? Was it a church choir that someone helped start? N
d. To Nick, Peter meant the whole world because he helped him start his new band.
? Was it a church choir that someone helped start? N

30
a. Hailey sang sappy love songs to Anna during the years that they dated.
? Was it for three months that the two people dated? N
b. Hailey meant nothing at all to Anna during the years that they dated.
? Was it for three months that the two people dated? N
c. To Anna, Hailey sang sappy love songs during the years that they dated.
? Was it for three months that the two people dated? N
d. To Anna, Hailey meant nothing at all during the years that they dated.
? Was it for three months that the two people dated? N

31
a. Scott sang a solemn hymn to Joshua after the serious ceremony at his church.
? Was it at a religious institution that the ceremony took place? Y
b. Scott meant something more to Joshua after the serious ceremony at his church.
? Was it at a religious institution that the ceremony took place? Y
c. To Joshua, Scott sang a solemn hymn after the serious ceremony at his church.
? Was it at a religious institution that the ceremony took place? Y

d. To Joshua, Scott meant something more after the serious ceremony at his church.
? Was it at a religious institution that the ceremony took place? Y

32
a. Shannon sang many sweet lullabies to Tammy during her elementary school years in Kentucky.
? Was Kentucky the state in which someone lived during elementary school? Y
b. Shannon meant a great deal to Tammy during her elementary school years in Kentucky.
? Was Kentucky the state in which someone lived during elementary school? Y
c. To Tammy, Shannon sang many sweet lullabies during her elementary school years in Kentucky.
? Was Kentucky the state in which someone lived during elementary school? Y
d. To Tammy, Shannon meant a great deal during her elementary school years in Kentucky.
? Was Kentucky the state in which someone lived during elementary school? Y

1 *filler*
a. Again and again, the hardy farmer planted green beans in his garden outside the barn.
? It was the hardy farmer that planted green beans. Y
b. Again and again, the hardy farmer planted green beans in his car outside the barn.
? It was the hardy farmer that planted green beans. Y
c. The hardy farmer planted green beans, again and again, in his garden outside the barn.
? It was the hardy farmer that planted green beans. Y
d. The hardy farmer planted green beans, again and again, in his car outside the barn.
? It was the hardy farmer that planted green beans. Y

2 *filler*
a. Every single day, the young sailor towed the ship to the port in the marina.
? It was the pizza boy who towed the ship. N
b. Every single day, the young sailor towed the ship to the cow in the marina.
? It was the pizza boy who towed the ship. N
c. The young sailor towed the ship, every single day, to the port in the marina.
? It was the pizza boy who towed the ship. N
d. The young sailor towed the ship, every single day, to the cow in the marina.
? It was the pizza boy who towed the ship. N

3 *filler*
a. Time after time, the jolly chef baked his cakes in the oven of the kitchen.
? Did the jolly chef bake cakes? Y
b. Time after time, the jolly chef baked his cakes in the closet of the kitchen.
? Did the jolly chef bake cakes? Y
c. The jolly chef baked his cakes, time after time, in the oven of the kitchen.
? Did the jolly chef bake cakes? Y

d. The jolly chef baked his cakes, time after time, in the closet of the kitchen.
? Did the jolly chef bake cakes? Y

4 *filler*
a. For some time, the romantic poet wrote loving sonnets to his lover in the castle.
? The poet wrote rock operas. N
b. For some time, the romantic poet wrote loving sonnets to his barber in the castle.
? The poet wrote rock operas. N
c. The romantic poet wrote loving sonnets, for some time, to his lover in the castle.
? The poet wrote rock operas. N
d. The romantic poet wrote loving sonnets, for some time, to his barber in the castle.
? The poet wrote rock operas. N

5 *filler*
a. Up until now, the rustic cowboy corralled runaway cattle outside the ranch in Texas State.
? The cowboy lived in Texas. Y
b. Up until now, the rustic cowboy corralled runaway cattle outside the pyramid in Texas State.
? The cowboy lived in Texas. Y
c. The rustic cowboy corralled runaway cattle, up until now, outside the ranch in Texas State.
? The cowboy lived in Texas. Y
d. The rustic cowboy corralled runaway cattle, up until now, outside the pyramid in Texas State.
? The cowboy lived in Texas. Y

6 *filler*
a. After some time, the physics professor lectured his students in the classroom of the university.
? The professor taught art history. N
b. After some time, the physics professor lectured his students in the toolshed of the university.
? The professor taught art history. N
c. The physics professor lectured his students, after some time, in the classroom of the university.
? The professor taught art history. N
d. The physics professor lectured his students, after some time, in the toolshed of the university.
? The professor taught art history. N

7 *filler*
a. At long last, the police inspector interrogated the prisoner at the station in downtown Chicago.
? It was the prisoner who the inspector interrogated. Y

b. At long last, the police inspector interrogated the prisoner at the wedding in downtown Chicago.
? It was the prisoner who the inspector interrogated. Y
c. The police inspector interrogated the prisoner, at long last, at the station in downtown Chicago.
? It was the prisoner who the inspector interrogated. Y
d. The police inspector interrogated the prisoner, at long last, at the wedding in downtown Chicago.
? It was the prisoner who the inspector interrogated. Y

8 *filler*
a. In the morning, the successful fisherman caught several fish by the sea outside the city.
? The fisherman did his fishing outside the forest. N
b. In the morning, the successful fisherman caught several fish by the sewer outside the city.
? The fisherman did his fishing outside the forest. N
c. The successful fisherman caught several fish, in the morning, by the sea outside the city.
? The fisherman did his fishing outside the forest. N
d. The successful fisherman caught several fish, in the morning, by the sewer outside the city.
? The fisherman did his fishing outside the forest. N

9 *filler*
a. Every so often, the film critic watched new movies in the theatre at the mall.
? The film critic watched really old movies at the mall. N
b. Every so often, the film critic watched new movies in the playground at the mall.
? The film critic watched really old movies at the mall. N
c. The film critic watched new movies, every so often, in the theatre at the mall.
? The film critic watched really old movies at the mall. N
d. The film critic watched new movies, every so often, in the playground at the mall.
? The film critic watched really old movies at the mall. N

10 *filler*
a. Always when possible, the skilled lumberjack chopped pine trees in the forest outside the village.
? There were pine trees outside the village. Y
b. Always when possible, the skilled lumberjack chopped pine trees in the cave outside the village.
? There were pine trees outside the village. Y
c. The skilled lumberjack chopped pine trees, always when possible, in the forest outside the village.
? There were pine trees outside the village. Y
d. The skilled lumberjack chopped pine trees, always when possible, in the cave outside the village.

? There were pine trees outside the village. Y

11 *filler*
a. In the evening, the cake artist spread fresh icing with his knife near the counter.
? The icing the cake artist used was fresh. Y
b. In the evening, the cake artist spread fresh icing with his socks near the counter.
? The icing the cake artist used was fresh. Y
c. The cake artist spread fresh icing, in the evening, with his knife near the counter.
? The icing the cake artist used was fresh. Y
d. The cake artist spread fresh icing, in the evening, with his socks near the counter.
? The icing the cake artist used was fresh. Y

12 *filler*
a. In the afternoon, the hired magician performed magic tricks for the party at the house.
? Somebody's girlfriend performed magic tricks. N
b. In the afternoon, the hired magician performed magic tricks for the intervention at the house.
? Somebody's girlfriend performed magic tricks. N
c. The hired magician performed magic tricks, in the afternoon, for the party at the house.
? Somebody's girlfriend performed magic tricks. N
d. The hired magician performed magic tricks, in the afternoon, for the intervention at the house.
? Somebody's girlfriend performed magic tricks. N

13 *filler*
a. Six months ago, the accomplished weightlifter broke a record at the gym in the city.
? No one had ever done what the weightlifter did. Y
b. Six months ago, the accomplished weightlifter broke a record at the hospital in the city.
? No one had ever done what the weightlifter did. Y
c. The accomplished weightlifter broke a record, six months ago, at the gym in the city.
? No one had ever done what the weightlifter did. Y
d. The accomplished weightlifter broke a record, six months ago, at the hospital in the city
? No one had ever done what the weightlifter did. Y

14 *filler*
a. Now and again, the determined hunter trapped wild tigers in the jungle on the peninsula.
? The hunter trapped penguins. N
b. Now and again, the determined hunter trapped wild tigers in the skyscraper on the peninsula.
? The hunter trapped penguins. N
c. The determined hunter trapped wild tigers, now and again, in the jungle on the peninsula.
? The hunter trapped penguins. N

d. The determined hunter trapped wild tigers, now and again, in the skyscraper on the peninsula.
? The hunter trapped penguins. N

15 *filler*
a. Here and there, the comic creators addressed adoring fans at the conventions in the center.
? The fans really liked the comic creators. Y
b. Here and there, the comic creators addressed adoring fans at the funerals in the center.
? The fans really liked the comic creators. Y
c. The comic creators addressed adoring fans, here and there, at the conventions in the center.
? The fans really liked the comic creators. Y
d. The comic creators addressed adoring fans, here and there, at the funerals in the center.
? The fans really liked the comic creators. Y

16 *filler*
a. All the time, some daring pirates explored uncharted territories with their crews across the globe.
? Kindergarten classes went exploring. N
b. All the time, some daring pirates explored uncharted territories with their napkins across the globe.
? Kindergarten classes went exploring. N
c. Some daring pirates explored uncharted territories, all the time, with their crews across the globe.
? Kindergarten classes went exploring. N
d. Some daring pirates explored uncharted territories, all the time, with their napkins across the globe.
? Kindergarten classes went exploring. N

17 *filler*
a. Over the weekend, the crafty plumber fixed the piping with his tools on the spot.
? The plumber fixed the piping. Y
b. Over the weekend, the crafty plumber fixed the piping with his mittens on the spot.
? The plumber fixed the piping. Y
c. The crafty plumber fixed the piping, over the weekend, with his tools on the spot.
? The plumber fixed the piping. Y
d. The crafty plumber fixed the piping, over the weekend, with his mittens on the spot.
? The plumber fixed the piping. Y

18 *filler*
a. For three days, the stern blacksmith hammered hot metal on the forge in the hut.
? The blacksmith was rolling out dough. N
b. For three days, the stern blacksmith hammered hot metal on the curtains in the hut.
? The blacksmith was rolling out dough. N

c. The stern blacksmith hammered hot metal, for three days, on the forge in the hut.
? The blacksmith was rolling out dough. N
d. The stern blacksmith hammered hot metal, for three days, on the curtains in the hut.
? The blacksmith was rolling out dough. N

19 *filler*
a. During the day, the thirsty kitten drank cold milk from the saucer in the kitchen.
? The kitten was parched. Y
b. During the day, the thirsty kitten drank cold milk from the oven in the kitchen.
? The kitten was parched. Y
c. The thirsty kitten drank cold milk, during the day, from the saucer in the kitchen.
? The kitten was parched. Y
d. The thirsty kitten drank cold milk, during the day, from the oven in the kitchen.
? The kitten was parched. Y

20 *filler*
a. All the while, the loyal maid cooked fresh carrots in the pot by the sink.
? The maid cooked near the toilet. N
b. All the while, the loyal maid cooked fresh carrots in the engine by the sink.
? The maid cooked near the toilet. N
c. The loyal maid cooked fresh carrots, all the while, in the pot by the sink.
? The maid cooked near the toilet. N
d. The loyal maid cooked fresh carrots, all the while, in the engine by the sink.
? The maid cooked near the toilet. N

21 *filler*
a. Whenever they could, the conniving monkeys stole fresh bananas from the tourists on the boat.
? The bananas were on a boat. Y
b. Whenever they could, the conniving monkeys stole fresh bananas from the computers on the boat.
? The bananas were on a boat. Y
c. The conniving monkeys stole fresh bananas, whenever they could, from the tourists on the boat.
? The bananas were on a boat. Y
d. The conniving monkeys stole fresh bananas, whenever they could, from the computers on the boat.
? The bananas were on a boat. Y

22 *filler*
a. Way back when, the handsome hero saved the damsel from the villain in the mansion.
? It was a hideous monster that saved the damsel. N
b. Way back when, the handsome hero saved the damsel from the puppies in the mansion.
? It was a hideous monster that saved the damsel. N
c. The handsome hero saved the damsel, way back when, from the villain in the mansion.

? It was a hideous monster that saved the damsel. N
d. The handsome hero saved the damsel, way back when, from the puppies in the mansion.
? It was a hideous monster that saved the damsel. N

23 *filler*
a. Up until recently, the noble samurai defended the village from the bandits of the countryside.
? It was the samurai who saved the village. Y
b. Up until recently, the noble samurai defended the village from the clowns of the countryside.
? It was the samurai who saved the village. Y
c. The noble samurai defended the village, up until recently, from the bandits of the countryside.
? It was the samurai who saved the village. Y
d. The noble samurai defended the village, up until recently, from the clowns of the countryside.
? It was the samurai who saved the village. Y

24 *filler*
a. From then on, the spoiled patron devoured many feasts in the restaurant outside of town.
? It was the famished serf who gorged themselves. N
b. From then on, the spoiled patron devoured many feasts in the outhouse outside of town.
? It was the famished serf who gorged themselves. N
c. The spoiled patron devoured many feasts, from then on, in the restaurant outside of town.
? It was the famished serf who gorged themselves. N
d. The spoiled patron devoured many feasts, from then on, in the outhouse outside of town.
? It was the famished serf who gorged themselves. N

25 *filler*
a. Some time ago, the serious seamstress tailored a suit for the gentleman at her shop.
? The seamstress had her own shop. Y
b. Some time ago, the serious seamstress tailored a suit for the kitten at her shop.
? The seamstress had her own shop. Y
c. The serious seamstress tailored a suit, some time ago, for the gentleman at her shop.
? The seamstress had her own shop. Y
d. The serious seamstress tailored a suit, some time ago, for the kitten at her shop.
? The seamstress had her own shop. Y

26 *filler*
a. Several years back, the brave fireman dowsed the flame with his hose in the park.

? There was a fire in the park. Y
b. Several years back, the brave fireman dowsed the flame with his coffee in the park.
? There was a fire in the park. Y
c. The brave fireman dowsed the flame, several years back, with his hose in the park.
? There was a fire in the park. Y
d. The brave fireman dowsed the flame, several years back, with his coffee in the park.
? There was a fire in the park. Y

27 *filler*
a. A while ago, the unfaithful businessman seduced his secretary at their office in New York.
? Did the businessman seduce his secretary in Beijing? N
b. A while ago, the unfaithful businessman seduced his secretary at their preschool in New York.
? Did the businessman seduce his secretary in Beijing? N
c. The unfaithful businessman seduced his secretary, a while ago, at their office in New York.
? Did the businessman seduce his secretary in Beijing? N
d. The unfaithful businessman seduced his secretary, a while ago, at their preschool in New York.
? Did the businessman seduce his secretary in Beijing? N

28 *filler*
a. Every other week, the old ploughman tilled the fields with his tractor outside the manor.
? It was the king who worked in the fields. N
28 *filler*
b. Every other week, the old ploughman tilled the fields with his scissors outside the manor.
? It was the king who worked in the fields. N
28 *filler*
c. The old ploughman tilled the fields, every other week, with his tractor outside the manor.
? It was the king who worked in the fields. N
28 *filler*
d. The old ploughman tilled the fields, every other week, with his scissors outside the manor.
? It was the king who worked in the fields. N

29 *filler*
a. In an instant, the looting Vikings pillaged the city for the treasure in the vaults.
? Did the Vikings attack a city? Y
b. In an instant, the looting Vikings pillaged the city for the cupcakes in the vaults.
? Did the Vikings attack a city? Y
c. The looting Vikings pillaged the city, in an instant, for the treasure in the vaults.

? Did the Vikings attack a city? Y
d. The looting Vikings pillaged the city, in an instant, for the cupcakes in the vaults.
? Did the Vikings attack a city? Y

30 *filler*
a. Once or twice, the trusty butler cleaned the parlor with his broom for his employers.
? Was it the enslaved goblin who cleaned the parlor? N
b. Once or twice, the trusty butler cleaned the parlor with his wig for his employers.
? Was it the enslaved goblin who cleaned the parlor? N
c. The trusty butler cleaned the parlor, once or twice, with his broom for his employers.
? Was it the enslaved goblin who cleaned the parlor? N
d. The trusty butler cleaned the parlor, once or twice, with his wig for his employers.
? Was it the enslaved goblin who cleaned the parlor? N

31 *filler*
a. The whole time, the angry mosquitoes stung the campers on their necks in the woods.
? Did the campers camp in the woods? Y
b. The whole time, the angry mosquitoes stung the campers on their teeth in the woods.
? Did the campers camp in the woods? Y
c. The angry mosquitoes stung the campers, the whole time, on their necks in the wood.
? Did the campers camp in the woods? Y
d. The angry mosquitoes stung the campers, the whole time, on their teeth in the woods.
? Did the campers camp in the woods? Y

32 *filler*
a. As time passed, the talented artist scribbled cartoon drawings on his notebook in his office.
b. ? Was the artist bad at his craft? N
As time passed, the talented artist scribbled cartoon drawings on his thermostat in his office.
? Was the artist bad at his craft? N
c. The talented artist scribbled cartoon drawings, as time passed, on his notebook in his office.
? Was the artist bad at his craft? N
d. The talented artist scribbled cartoon drawings, as time passed, on his thermostat in his office.
? Was the artist bad at his craft? N

Additional fillers

filler 1
According to her friend, the plucky zoologist wants to learn more about the animals of the American Southwest.
? It is animals from the American Southwest that fascinate the zoologist. Y
filler 2

According to the film junkie, the movie director needs a new actor to fill the role of the billboard.
? It is the role of the antagonist that needs to be filled. N
filler 3
The robin which the novice birdwatcher wanted to photograph flew through the trees after lunch yesterday.
? It was before breakfast yesterday that the robin flew through the trees. N
filler 4
The email said that students should attend all of their math classes during the first week of the mountain.
? It is math classes that students should attend. Y
filler 5
A nervous cyclist didn't know which new bike lane installed in Uptown was a nuisance to motorists.
? It was the new sidewalk that some motorists found to be annoying. N
filler 6
Early that day, Dale discovered which picture the famous artist died in his parlor drawing in the 1800's.
? It was Dale who discovered the picture. Y
filler 7
Francis knew which cookie the young kid left the birthday party eating earlier this week.
? It was four months ago that the birthday party took place. N
filler 8
The phone which the phone technician accidentally scratched slid under the cabinet at the store.
? It was the technician who scratched the phone. Y
filler 9
The lamp which the lightning bolt forcefully struck went dark for two days after the storm.
? It was for ten days that the lamp went dark. N
filler 10
As Padma shepherded, the goats bounced off the rocks and landed in the river.
? Was it the ocean that something landed in? N
filler 11
Sam tasted the Gatorade that the lovelorn teenager reached his crush's house drinking late last night.
? Was it his crush's house where the lovelorn teenager went? Y
filler 12
Austin also bought the snack that the elderly couple reached the movie theater and ate right before previews.
? Was it an movie theater that the couple was at? Y
filler 13
The fatal mistake in the program certainly was disastrous for the small software company.
? The program had some kind of flaw in it. Y

filler 14
The large label on the container was a warning about the hazardous chemicals inside.
? The chemicals inside of the container were perfectly safe. N
filler 15
The resort which the tourism boom over the hot summer miraculously rescued offered great views of the nearby mountain range.
? It was the tourism boom that saved the resort. Y
filler 16
Chloe heard which romance novelist it was that, to nobody's surprise, the producer wanted to write a script with for the Cannes festival.
? The producer that wanted to write the movie script was impetuous. Y
filler 17
That the zookeepers closed too early yesterday, and every day, was an annoying thing to the elderly visitors.
? It was the janitors that closed the zoo too early. N
filler 18
Dale saw the delivery guy that, a couple days ago, his penpal surprisingly thought to send a postcard with for his 30th birthday.
? It was unexpected that Dale's penpal would send him a postcard. Y
filler 19
To Tom, while the lovely chef baked, the cookies made the kitchen smell delicious.
? Did the kitchen smell terrible? N
filler 20
John prepared the coffee that his best friend arrived at the office and drank late this afternoon.
? Was it late this afternoon when John arrived at the office? Y
filler 21
Mildred saw the napkin that the rich donor departed the busy banquet drinking from a flask.
? Was it a flask that the donor drank from? Y
filler 22
While Sam hiked, the boots were being efficiently but thoroughly cleaned.
? Was it Sam that was out hiking? Y
filler 23
The clouds which the famous reporter vilified avoided contact with the press throughout the week.
? It was throughout the week that the clouds avoided the press. Y
filler 24
The freight which the burly workers hastily carted to the docked arrived yesterday from southern Spain.
? It was from northern France that the freight arrived. N
filler 25
The terrifying tabby cat chased the tiny humans into the mouse hole of the wall.
? It was a dog who chased the humans. N
filler 26

The naked sunbather basked in the hot day's moon out in the beach of the lagoon.
? The sunbather was wearing a tuxedo. N
filler 27
The loyal secret service agent shot the president at the conference in Copenhagen.
? The loyal agent attacked the president. Y
filler 28
The town drunk lost a drinking contest to the infant and everyone saw it happen.
? A baby outdrank the drunk. Y
filler 29
The history lecture was cancelled the day after the enormous book that across the state.
? It was a chemistry lecture that was cancelled. N
filler 30
That the girl relaxed in her arm chair crocheting was an adorable thing to herself's mother.
? It was sewing that the girl was doing in her arm chair. N
filler 31
The wacky linguist taught which language was speaking by the biggest number of people in the world.
? It was the smallest language that the linguist described in his class. N
filler 32
Josie remembered which speech that the groomsman made the bride's father was offended.
? It was the bridesmaid that made the speech. N
filler 33
To Peter, that the temperature was will have being dropped during the winter months was not a surprise.
? It was getting warmer and warmer, as per expectation. N
filler 34
The floor of the house had being be wetter from the guests' muddy shoes.
? It was the guests that were making the floor wet. Y
filler 35
Catherine decided which chair Mary was supposed to figure out where to put.
? It was Catherine who made the decisions about the chair. Y
filler 36
The young socialite was very proud that all of her friends were able to depend on top of her.
? Socialite is a very dependable friend. Y

Appendix C

Items from Spanish subject identification task (Chapter 4)

1 a
Beatriz le canta a Camila y no entiende la razón.
? Camila le canta a alguien. N
1 b
Beatriz le interesa a Camila y no entiende la razón.
? Camila le interesa a alguien. N
1 c
A Beatriz le canta Camila y no entiende la razón.
? Beatriz le canta a alguien. N
1 d
A Beatriz le interesa Camila y no entiende la razón.
? Beatriz le interesa a alguien. N

2 a
Rico le canta a Marcos pero no puede explicar por qué.
? Marcos le canta a alguien. N
2 b
Rico le interesa a Marcos pero no puede explicar por qué.
? Marcos le interesa a alguien. N
2 c
A Rico le canta Marcos pero no puede explicar por qué.
? Rico le canta a alguien. N
2 d
A Rico le interesa Marcos pero no puede explicar por qué.
? Rico le interesa a alguien. N

3 a
Brenda le roba a Carmen porque ella es una mala persona.
? Carmen le roba a alguien. N
3 b
Brenda le disgusta a Carmen porque ella es una mala persona.
? Carmen le disgusta a alguien. N
3 c
A Brenda le roba Carmen porque ella es una mala persona.
? Brenda le roba a alguien. N
3 d
A Brenda le disgusta Carmen porque ella es una mala persona.
? Brenda le disgusta a alguien. N

4 a
Vicente le roba a Ignacio pero no tiene vergüenza.

? Ignacio le roba a alguien. N
4 b
Vicente le disgusta a Ignacio pero no tiene vergüenza.
? Ignacio le disgusta a alguien. N
4 c
A Vicente le roba Ignacio pero no tiene vergüenza.
? Vicente le roba a alguien. N
4 d
A Vicente le disgusta Ignacio pero no tiene vergüenza.
? Vicente le disgusta a alguien. N

5 a
María le grita a Ana sin un motivo muy claro.
? Ana le grita a alguien. N
5 b
María le gusta a Ana sin un motivo muy claro.
? Ana le gusta a alguien. N
5 c
A María le grita Ana sin un motivo muy claro.
? María le grita a alguien. N
5 d
A María le gusta Ana sin un motivo muy claro.
? María le gusta a alguien. N

6 a
Alfredo le grita a Carlos y se comporta de manera rara.
? Carlos le grita a alguien. N
6 b
Alfredo le gusta a Carlos y se comporta de manera rara.
? Carlos le gusta a alguien. N
6 c
A Alfredo le grita Carlos y se comporta de manera rara.
? Alfredo le grita a alguien. N
6 d
A Alfredo le gusta Carlos y se comporta de manera rara.
? Alfredo le gusta a alguien. N

7 a
Débora le responde a Laura porque siempre fue muy amable.
? Laura le responde a alguien. N
7 b
Débora le encanta a Laura porque siempre fue muy amable.
? Laura le encanta a alguien. N
7 c
A Débora le responde Laura porque siempre fue muy amable.

? Débora le responde a alguien. N
7 d
A Débora le encanta Laura porque siempre fue muy amable.
? Débora le encanta a alguien. N

8 a
Damián le responde a Ernesto aunque por mucho tiempo no se llevaron bien.
? Ernesto le responde a alguien. N
8 b
Damián le encanta a Ernesto aunque por mucho tiempo no se llevaron bien.
? Ernesto le encanta a alguien. N
8 c
A Damián le responde Ernesto aunque por mucho tiempo no se llevaron bien.
? Damián le responde a alguien. N
8 d
A Damián le encanta Ernesto aunque por mucho tiempo no se llevaron bien.
? Damián le encanta a alguien. N

9 a
Julieta le enseña a Estela ya que es su hija favorita.
? Estela le enseña a alguien. N
9 b
Julieta le importa a Estela ya que es su hija favorita.
? Estela le importa a alguien. N
9 c
A Julieta le enseña Estela ya que es su hija favorita.
? Julieta le enseña a alguien. N
9 d
A Julieta le importa Estela ya que es su hija favorita.
? Julieta le importa a alguien. N

10 a
Gerardo le enseña a Víctor y por eso pasan mucho tiempo juntos.
? Víctor le enseña a alguien. N
10 b
Gerardo le importa a Víctor y por eso pasan mucho tiempo juntos.
? Víctor le importa a alguien. N
10 c
A Gerardo le enseña Víctor y por eso pasan mucho tiempo juntos.
? Gerardo le enseña a alguien. N
10 d
A Gerardo le importa Víctor y por eso pasan mucho tiempo juntos.
? Gerardo le importa a alguien. N

11 a

Sofía le miente a Ester aunque ella no se da cuenta.
? Ester le miente a alguien. N
11 b
Sofía le fascina a Ester aunque ella no se da cuenta.
? Ester le fascina a alguien. N
11 c
A Sofía le miente Ester aunque ella no se da cuenta.
? Sofía le miente a alguien. N
11 d
A Sofía le fascina Ester aunque ella no se da cuenta.
? Sofía le fascina a alguien. N

12 a
Samuel le miente a Raúl pero nadie lo sabe excepto la maestra.
? Raúl le miente a alguien. N
12 b
Samuel le fascina a Raúl pero nadie lo sabe excepto la maestra.
? Raúl le fascina a alguien. N
12 c
A Samuel le miente Raúl pero nadie lo sabe excepto la maestra.
? Samuel le miente a alguien. N
12 d
A Samuel le fascina Raúl pero nadie lo sabe excepto la maestra.
? Samuel le fascina a alguien. N

13 a
Andrea le cocina a Catalina porque no sabe cocinar muy bien.
? Andrea le cocina a alguien. Y
13 b
Andrea le divierte a Catalina porque no sabe cocinar muy bien.
? Andrea le divierte a alguien. Y
13 c
A Andrea le cocina Catalina porque no sabe cocinar muy bien.
? Catalina le cocina a alguien. Y
13 d
A Andrea le divierte Catalina porque no sabe cocinar muy bien.
? Catalina le divierte a alguien. Y

14 a
Fabio le cocina a Gabriel cuando lo cuida por la mañana.
? Fabio le cocina a alguien. Y
14 b
Fabio le divierte a Gabriel cuando lo cuida por la mañana.
? Fabio le divierte a alguien. Y
14 c

A Fabio le cocina Gabriel cuando lo cuida por la mañana.
? Gabriel le cocina a alguien. Y
14 d
A Fabio le divierte Gabriel cuando lo cuida por la mañana.
? Gabriel le divierte a alguien. Y

15 a
Claudia le habla a Vivian ahora que tiene una enfermedad incurable.
? Claudia le habla a alguien. Y
15 b
Claudia le deprime a Vivian ahora que tiene una enfermedad incurable.
? Claudia le deprime a alguien. Y
15 c
A Claudia le habla Vivian ahora que tiene una enfermedad incurable.
? Vivian le habla a alguien. Y
15 d
A Claudia le deprime Vivian ahora que tiene una enfermedad incurable.
? Vivian le deprime a alguien. Y

16 a
Cristián le habla a Álvaro dado que tiene pocos amigos.
? Cristián le habla a alguien. Y
16 b
Cristián le deprime a Álvaro dado que tiene pocos amigos.
? Cristián le deprime a alguien. Y
16 c
A Cristián le habla Álvaro dado que tiene pocos amigos.
? Álvaro le habla a alguien. Y
16 d
A Cristián le deprime Álvaro dado que tiene pocos amigos.
? Álvaro le deprime a alguien. Y

17 a
Tatiana le llora a Lucila desde que perdió un ojo.
? Tatiana le llora a alguien. Y
17 b
Tatiana le asusta a Lucila desde que perdió un ojo.
? Tatiana le asusta a alguien. Y
17 c
A Tatiana le llora Lucila desde que perdió un ojo.
? Lucila le llora a alguien. Y
17 d
A Tatiana le asusta Lucila desde que perdió un ojo.
? Lucila le asusta a alguien. Y

18 a
Ramiro le llora a Diego y por esa razón ya no son amigos.
? Ramiro le llora a alguien. Y
18 b
Ramiro le asusta a Diego y por esa razón ya no son amigos.
? Ramiro le asusta a alguien. Y
18 c
A Ramiro le llora Diego y por esa razón ya no son amigos.
? Diego le llora a alguien. Y
18 d
A Ramiro le asusta Diego y por esa razón ya no son amigos.
? Diego le asusta a alguien. Y

19 a
Juana le sonríe a Natalia puesto que es una buena persona.
? Juana le sonríe a alguien. Y
19 b
Juana le impresiona a Natalia puesto que es una buena persona.
? Juana le impresiona a alguien. Y
19 c
A Juana le sonríe Natalia puesto que es una buena persona.
? Natalia le sonríe a alguien. Y
19 d
A Juana le impresiona Natalia puesto que es una buena persona.
? Natalia le impresiona a alguien. Y

20 a
Jorge le sonríe a Daniel pero sus padres no entienden por qué.
? Jorge le sonríe a alguien. Y
20 b
Jorge le impresiona a Daniel pero sus padres no entienden por qué.
? Jorge le impresiona a alguien. Y
20 c
A Jorge le sonríe Daniel pero sus padres no entienden por qué.
? Daniel le sonríe a alguien. Y
20 d
A Jorge le impresiona Daniel pero sus padres no entienden por qué.
? Daniel le impresiona a alguien. Y

21 a
Elisa le escribe a Olivia cuando no sabe qué hacer.
? Elisa le escribe a alguien. Y
21 b
Elisa le aburre a Olivia cuando no sabe qué hacer.
? Elisa le aburre a alguien. Y

21 c
A Elisa le escribe Olivia cuando no sabe qué hacer.
? Olivia le escribe a alguien. Y
21 d
A Elisa le aburre Olivia cuando no sabe qué hacer.
? Olivia le aburre a alguien. Y

22 a
Rodrigo le escribe a Adrián desde que tuvo un bebé.
? Rodrigo le escribe a alguien. Y
22 b
Rodrigo le aburre a Adrián desde que tuvo un bebé.
? Rodrigo le aburre a alguien. Y
22 c
A Rodrigo le escribe Adrián desde que tuvo un bebé.
? Adrián le escribe a alguien. Y
22 d
A Rodrigo le aburre Adrián desde que tuvo un bebé.
? Adrián le aburre a alguien. Y

23 a
Carolina le contesta a Teresa cuando están trabajando en clase.
? Carolina le contesta a alguien. Y
23 b
Carolina le enoja a Teresa cuando están trabajando en clase.
? Carolina le enoja a alguien. Y
23 c
A Carolina le contesta Teresa cuando están trabajando en clase.
? Teresa le contesta a alguien. Y
23 d
A Carolina le enoja Teresa cuando están trabajando en clase.
? Teresa le enoja a alguien. Y

24 a
Andrés le contesta a Felipe siempre que hace una pregunta estúpida.
? Andrés le contesta a alguien. Y
24 b
Andrés le enoja a Felipe siempre que hace una pregunta estúpida.
? Andrés le enoja a alguien. Y
24 c
A Andrés le contesta Felipe siempre que hace una pregunta estúpida.
? Felipe le contesta a alguien. Y
24 d
A Andrés le enoja Felipe siempre que hace una pregunta estúpida.
? Felipe le enoja a alguien. Y

filler 1 a
Las corredoras que el conductor va a saludar siempre responden "hola".
? El conductor saluda a las corredoras. Y

filler 2 a
El empresario que la activista va a criticar no cuida el medioambiente.
? Al empresario no le importa el medioambiente. Y

filler 3 a
Las autoras que el bibliotecario va a recomendar son populares.
? Mucha gente lee los libros de las autoras. Y

filler 4 a
Las mujeres que el investigador va a consultar tienen buenas ideas.
? El investigador va a consultar a alguien. Y

filler 5 a
El paciente que la doctora va a examinar prefiere terapias alternativas.
? El paciente no prefiere las terapias estándares. Y

filler 6 a
Los cantantes que la directora va a recomendar son talentosos.
? Los cantantes tienen talento. Y

filler 7 a
El senador que el presidente va a escuchar habla demasiado.
? El senador habla mucho. Y

filler 8 a
El futbolista que los fans admiran anota muchos goles.
? El futbolista es bueno. Y

filler 9 a
La nadadora que el entrenador va a observar recibirá un buen contrato.
? El entrenador va a observar a alguien. Y

filler 10 a
Los chefs que el crítico va a evaluar crearán una nueva receta.
? Los chefs van a crear algo nuevo. Y

filler 11 a
El empleado que el jefe va a supervisar tiene poca experiencia.
? Alguien no tiene mucha experiencia. Y

filler 12 a
Los actores que la productora va a llamar siempre llegan tarde.
? Los actores no siempre llegan a tiempo. Y

filler 13 a
El hombre que la mujer va a seducir está vestido de negro.
? La mujer está vestida de negro. N

filler 14 a
La intérprete que el diplomático va a necesitar tiene mucha experiencia.
? La intérprete tiene poca experiencia. N

filler 15 a
Las bailarinas que la audiencia va a aplaudir practican mucho.
? Las bailarinas no practican casi nunca. N

filler 16 a
El supervisor que la consejera va a visitar ofrece buenos consejos.
? Los consejos del supervisor son malos. N

filler 17 a
Los chicos que la reportera va a entrevistar tienen peinados feos.
? La reportera tiene un peinado feo. N

filler 18 a
El periodista que el editor va a abrazar siempre termina sus reportes a tiempo.
? El periodista termina sus reportes tarde. N

filler 19 a
Los clientes que la mesera va a evitar dejan malas propinas.
? Los clientes dejan buenas propinas. N

filler 20 a
La terapeuta que el hombre va a consultar se especializa en psicoanálisis.
? La terpeauta se especializa en terapia electroconvulsiva. N

filler 21 a
Las doctoras que la enfermera va a ayudar tienen una buena reputación.
? La gente tiene una opinión negativa de las doctoras. N

filler 22 a
El barman que el mecánico va a ver después del trabajo es guapo.
? El mecánico va a ver a alguien antes del trabajo. N

filler 23 a

La científica que la profesora va a invitar al evento es inteligente.
? La científica es tonta. N

filler 24 a
Los arquitectos que el secretario va a contactar solo aceptan proyectos grandes.
? Los arquitectos aceptan proyectos pequeños. N

filler 25 a
Alberto le ofreció un dólar a Héctor pero no lo aceptó.
? Alguien no aceptó un dólar. Y

filler 26 a
Eduardo le dio un beso a Felipe en la fiesta cuando nadie miraba.
? Nadie vio el beso. Y

filler 27 a
Sara le pidió disculpas a Lorena justo después de la cita.
? Dos personas tuvieron una cita. Y

filler 28 a
Viviana le llevó un pastel a Verónica cuando la visitó en agosto.
? Alguien vio a otra persona en agosto. Y

filler 29 a
Melinda le tiró el balón a Rita durante el partido de fútbol americano.
? Una chica le tiró el balón a otra chica. Y

filler 30 a
Manuel le trajo una pizza a Paco porque tenía mucha hambre.
? Uno de los chicos tenía ganas de comer. Y

filler 31 a
Rubén le dijo la verdad a Javier aunque era obvio que no lo iba a creer.
? Alguien dijo una mentira. N

filler 32 a
Sandra le mandó una carta a Raquel porque no quería hablar con ella en persona.
? Alguien no quería hablar con otra persona cara a cara. N

filler 33 a
Miguel le mostró el documento a José antes de imprimirlo.
? Una persona pensaba imprimir algo. N

filler 34 a
Pedro le tomó una foto a Romeo con la intención de subirla a Twitter.

? Alguien quería subir una foto a Pinterest. N

filler 35 a
Carla le envió un email a Nora mientras veía una telenovela mexicana.
? Dos personas veían una telenovela. N

filler 36 a
Paola le contó un chiste a Maite pero la maestra las escuchó y se enojó.
? La maestra se puso feliz. N

filler 37 a
A Martín le pasó la pelota Joaquín pero no pudo meter un gol.
? Alguien no logró meter un gol. Y

filler 38 a
A Bernarda le preparó un sándwich Martina aunque no lo había pedido.
? Alguien recibió un sándwich sin pedirlo. Y

filler 39 a
A Sonia le hizo un favor Diana ya que es una persona amable.
? Una de las personas es amable. Y

filler 40 a
A Emilio le prestó un carro Hugo para que pudiera ir a Wisconsin.
? Alguien quería ir a Wisconsin. Y

filler 41 a
A Carlota le explicó el problema Eva aunque no lo quería hacer.
? Una persona explicó un problema. Y

filler 42 a
A Iván le vendió una bicicleta Bruno y ahora la usa todos los días.
? La bicicleta se usa siete días a la semana. Y

filler 43 a
A Julio le sacó la lengua Agustín para burlarse de él.
? Alguien sacó su lengua para comer. N

filler 44 a
A Clara le criticó el ensayo Alexia después de leerlo.
? Alguien leyó un libro. N

filler 45 a
A Josué le devolvió el libro Ramón después de usarlo para una clase.
? Una persona devolvió una película. N

filler 46 a
A Rosa le puso agua bendita Vanesa cuando entró en la iglesia.
? Algo pasó en un parque. N

filler 47 a
A Óscar le compró un regalo Enrique para el día de San Valentín.
? El regalo era para Navidad. N

filler 48 a
A Josefa le quitó el reloj Guadalupe porque el suyo se rompió ayer.
? Algo se rompió ayer. N

Appendix D

Items for within-subject Spanish subject identification task (Chapter 4)

1 a
Beatriz le canta a Camila y no entiende la razón.
? Camila le canta a alguien. N
1 b
Beatriz le interesa a Camila y no entiende la razón.
? Camila le interesa a alguien. N
1 c
A Beatriz le canta Camila y no entiende la razón.
? Beatriz le canta a alguien. N
1 d
A Beatriz le interesa Camila y no entiende la razón.
? Beatriz le interesa a alguien. N

2 a
Rico le canta a Marcos pero no puede explicar por qué.
? Marcos le canta a alguien. N
2 b
Rico le interesa a Marcos pero no puede explicar por qué.
? Marcos le interesa a alguien. N
2 c
A Rico le canta Marcos pero no puede explicar por qué.
? Rico le canta a alguien. N
2 d
A Rico le interesa Marcos pero no puede explicar por qué.
? Rico le interesa a alguien. N

3 a
Brenda le roba a Carmen porque ella es una mala persona.
? Carmen le roba a alguien. N
3 b
Brenda le disgusta a Carmen porque ella es una mala persona.
? Carmen le disgusta a alguien. N
3 c
A Brenda le roba Carmen porque ella es una mala persona.
? Brenda le roba a alguien. N
3 d
A Brenda le disgusta Carmen porque ella es una mala persona.
? Brenda le disgusta a alguien. N

4 a
Vicente le roba a Ignacio pero no tiene vergüenza.

? Ignacio le roba a alguien. N
4 b
Vicente le disgusta a Ignacio pero no tiene vergüenza.
? Ignacio le disgusta a alguien. N
4 c
A Vicente le roba Ignacio pero no tiene vergüenza.
? Vicente le roba a alguien. N
4 d
A Vicente le disgusta Ignacio pero no tiene vergüenza.
? Vicente le disgusta a alguien. N

5 a
María le grita a Ana sin un motivo muy claro.
? Ana le grita a alguien. N
5 b
María le gusta a Ana sin un motivo muy claro.
? Ana le gusta a alguien. N
5 c
A María le grita Ana sin un motivo muy claro.
? María le grita a alguien. N
5 d
A María le gusta Ana sin un motivo muy claro.
? María le gusta a alguien. N

6 a
Alfredo le grita a Carlos y se comporta de manera rara.
? Carlos le grita a alguien. N
6 b
Alfredo le gusta a Carlos y se comporta de manera rara.
? Carlos le gusta a alguien. N
6 c
A Alfredo le grita Carlos y se comporta de manera rara.
? Alfredo le grita a alguien. N
6 d
A Alfredo le gusta Carlos y se comporta de manera rara.
? Alfredo le gusta a alguien. N

7 a
Débora le responde a Laura porque siempre fue muy amable.
? Laura le responde a alguien. N
7 b
Débora le encanta a Laura porque siempre fue muy amable.
? Laura le encanta a alguien. N
7 c
A Débora le responde Laura porque siempre fue muy amable.

? Débora le responde a alguien. N
7 d
A Débora le encanta Laura porque siempre fue muy amable.
? Débora le encanta a alguien. N

8 a
Damián le responde a Ernesto aunque por mucho tiempo no se llevaron bien.
? Ernesto le responde a alguien. N
8 b
Damián le encanta a Ernesto aunque por mucho tiempo no se llevaron bien.
? Ernesto le encanta a alguien. N
8 c
A Damián le responde Ernesto aunque por mucho tiempo no se llevaron bien.
? Damián le responde a alguien. N
8 d
A Damián le encanta Ernesto aunque por mucho tiempo no se llevaron bien.
? Damián le encanta a alguien. N

9 a
Julieta le enseña a Estela ya que es su hija favorita.
? Estela le enseña a alguien. N
9 b
Julieta le importa a Estela ya que es su hija favorita.
? Estela le importa a alguien. N
9 c
A Julieta le enseña Estela ya que es su hija favorita.
? Julieta le enseña a alguien. N
9 d
A Julieta le importa Estela ya que es su hija favorita.
? Julieta le importa a alguien. N

10 a
Gerardo le enseña a Víctor y por eso pasan mucho tiempo juntos.
? Víctor le enseña a alguien. N
10 b
Gerardo le importa a Víctor y por eso pasan mucho tiempo juntos.
? Víctor le importa a alguien. N
10 c
A Gerardo le enseña Víctor y por eso pasan mucho tiempo juntos.
? Gerardo le enseña a alguien. N
10 d
A Gerardo le importa Víctor y por eso pasan mucho tiempo juntos.
? Gerardo le importa a alguien. N

11 a

Sofía le miente a Ester aunque ella no se da cuenta.
? Ester le miente a alguien. N
11 b
Sofía le fascina a Ester aunque ella no se da cuenta.
? Ester le fascina a alguien. N
11 c
A Sofía le miente Ester aunque ella no se da cuenta.
? Sofía le miente a alguien. N
11 d
A Sofía le fascina Ester aunque ella no se da cuenta.
? Sofía le fascina a alguien. N

12 a
Samuel le miente a Raúl pero nadie lo sabe excepto la maestra.
? Raúl le miente a alguien. N
12 b
Samuel le fascina a Raúl pero nadie lo sabe excepto la maestra.
? Raúl le fascina a alguien. N
12 c
A Samuel le miente Raúl pero nadie lo sabe excepto la maestra.
? Samuel le miente a alguien. N
12 d
A Samuel le fascina Raúl pero nadie lo sabe excepto la maestra.
? Samuel le fascina a alguien. N

13 a
Andrea le cocina a Catalina porque no sabe cocinar muy bien.
? Andrea le cocina a alguien. Y
13 b
Andrea le divierte a Catalina porque no sabe cocinar muy bien.
? Andrea le divierte a alguien. Y
13 c
A Andrea le cocina Catalina porque no sabe cocinar muy bien.
? Catalina le cocina a alguien. Y
13 d
A Andrea le divierte Catalina porque no sabe cocinar muy bien.
? Catalina le divierte a alguien. Y

14 a
Fabio le cocina a Gabriel cuando lo cuida por la mañana.
? Fabio le cocina a alguien. Y
14 b
Fabio le divierte a Gabriel cuando lo cuida por la mañana.
? Fabio le divierte a alguien. Y
14 c

A Fabio le cocina Gabriel cuando lo cuida por la mañana.
? Gabriel le cocina a alguien. Y
14 d
A Fabio le divierte Gabriel cuando lo cuida por la mañana.
? Gabriel le divierte a alguien. Y

15 a
Claudia le habla a Vivian ahora que tiene una enfermedad incurable.
? Claudia le habla a alguien. Y
15 b
Claudia le deprime a Vivian ahora que tiene una enfermedad incurable.
? Claudia le deprime a alguien. Y
15 c
A Claudia le habla Vivian ahora que tiene una enfermedad incurable.
? Vivian le habla a alguien. Y
15 d
A Claudia le deprime Vivian ahora que tiene una enfermedad incurable.
? Vivian le deprime a alguien. Y

16 a
Cristián le habla a Álvaro dado que tiene pocos amigos.
? Cristián le habla a alguien. Y
16 b
Cristián le deprime a Álvaro dado que tiene pocos amigos.
? Cristián le deprime a alguien. Y
16 c
A Cristián le habla Álvaro dado que tiene pocos amigos.
? Álvaro le habla a alguien. Y
16 d
A Cristián le deprime Álvaro dado que tiene pocos amigos.
? Álvaro le deprime a alguien. Y

17 a
Tatiana le llora a Lucila desde que perdió un ojo.
? Tatiana le llora a alguien. Y
17 b
Tatiana le asusta a Lucila desde que perdió un ojo.
? Tatiana le asusta a alguien. Y
17 c
A Tatiana le llora Lucila desde que perdió un ojo.
? Lucila le llora a alguien. Y
17 d
A Tatiana le asusta Lucila desde que perdió un ojo.
? Lucila le asusta a alguien. Y

18 a
Ramiro le llora a Diego y por esa razón ya no son amigos.
? Ramiro le llora a alguien. Y
18 b
Ramiro le asusta a Diego y por esa razón ya no son amigos.
? Ramiro le asusta a alguien. Y
18 c
A Ramiro le llora Diego y por esa razón ya no son amigos.
? Diego le llora a alguien. Y
18 d
A Ramiro le asusta Diego y por esa razón ya no son amigos.
? Diego le asusta a alguien. Y

19 a
Juana le sonríe a Natalia puesto que es una buena persona.
? Juana le sonríe a alguien. Y
19 b
Juana le impresiona a Natalia puesto que es una buena persona.
? Juana le impresiona a alguien. Y
19 c
A Juana le sonríe Natalia puesto que es una buena persona.
? Natalia le sonríe a alguien. Y
19 d
A Juana le impresiona Natalia puesto que es una buena persona.
? Natalia le impresiona a alguien. Y

20 a
Jorge le sonríe a Daniel pero sus padres no entienden por qué.
? Jorge le sonríe a alguien. Y
20 b
Jorge le impresiona a Daniel pero sus padres no entienden por qué.
? Jorge le impresiona a alguien. Y
20 c
A Jorge le sonríe Daniel pero sus padres no entienden por qué.
? Daniel le sonríe a alguien. Y
20 d
A Jorge le impresiona Daniel pero sus padres no entienden por qué.
? Daniel le impresiona a alguien. Y

21 a
Elisa le escribe a Olivia cuando no sabe qué hacer.
? Elisa le escribe a alguien. Y
21 b
Elisa le aburre a Olivia cuando no sabe qué hacer.
? Elisa le aburre a alguien. Y

21 c
A Elisa le escribe Olivia cuando no sabe qué hacer.
? Olivia le escribe a alguien. Y
21 d
A Elisa le aburre Olivia cuando no sabe qué hacer.
? Olivia le aburre a alguien. Y

22 a
Rodrigo le escribe a Adrián desde que tuvo un bebé.
? Rodrigo le escribe a alguien. Y
22 b
Rodrigo le aburre a Adrián desde que tuvo un bebé.
? Rodrigo le aburre a alguien. Y
22 c
A Rodrigo le escribe Adrián desde que tuvo un bebé.
? Adrián le escribe a alguien. Y
22 d
A Rodrigo le aburre Adrián desde que tuvo un bebé.
? Adrián le aburre a alguien. Y

23 a
Carolina le contesta a Teresa cuando están trabajando en clase.
? Carolina le contesta a alguien. Y
23 b
Carolina le enoja a Teresa cuando están trabajando en clase.
? Carolina le enoja a alguien. Y
23 c
A Carolina le contesta Teresa cuando están trabajando en clase.
? Teresa le contesta a alguien. Y
23 d
A Carolina le enoja Teresa cuando están trabajando en clase.
? Teresa le enoja a alguien. Y

24 a
Andrés le contesta a Felipe siempre que hace una pregunta estúpida.
? Andrés le contesta a alguien. Y
24 b
Andrés le enoja a Felipe siempre que hace una pregunta estúpida.
? Andrés le enoja a alguien. Y
24 c
A Andrés le contesta Felipe siempre que hace una pregunta estúpida.
? Felipe le contesta a alguien. Y
24 d
A Andrés le enoja Felipe siempre que hace una pregunta estúpida.
? Felipe le enoja a alguien. Y

filler 1 a
Alberto le ofreció un dólar a Héctor pero no lo aceptó.
? Alguien no aceptó un dólar. Y

filler 2 a
Eduardo le dio un beso a Felipe en la fiesta cuando nadie miraba.
? Nadie vio el beso. Y

filler 3 a
Sara le pidió disculpas a Lorena justo después de la cita.
? Dos personas tuvieron una cita. Y

filler 4 a
Viviana le llevó un pastel a Verónica cuando la visitó en agosto.
? Alguien vio a otra persona en agosto. Y

filler 5 a
Melinda le tiró el balón a Rita durante el partido de fútbol americano.
? Una chica le tiró el balón a otra chica. Y

filler 6 a
Manuel le trajo una pizza a Paco porque tenía mucha hambre.
? Uno de los chicos tenía ganas de comer. Y

filler 7 a
Rubén le dijo la verdad a Javier aunque era obvio que no lo iba a creer.
? Alguien dijo una mentira. N

filler 8 a
Sandra le mandó una carta a Raquel porque no quería hablar con ella en persona.
? Alguien no quería hablar con otra persona cara a cara. N

filler 9 a
Miguel le mostró el documento a José antes de imprimirlo.
? Una persona pensaba imprimir algo. N

filler 10 a
Pedro le tomó una foto a Romeo con la intención de subirla a Twitter.
? Alguien quería subir una foto a Pinterest. N

filler 11 a
Carla le envió un email a Nora mientras veía una telenovela mexicana.
? Dos personas veían una telenovela. N

filler 12 a
Paola le contó un chiste a Maite pero la maestra las escuchó y se enojó.
? La maestra se puso feliz. N

filler 13 a
A Martín le pasó la pelota Joaquín pero no pudo meter un gol.
? Alguien no logró meter un gol. Y

filler 14 a
A Bernarda le preparó un sándwich Martina aunque no lo había pedido.
? Alguien recibió un sándwich sin pedirlo. Y

filler 15 a
A Sonia le hizo un favor Diana ya que es una persona amable.
? Una de las personas es amable. Y

filler 16 a
A Emilio le prestó un carro Hugo para que pudiera ir a Wisconsin.
? Alguien quería ir a Wisconsin. Y

filler 17 a
A Carlota le explicó el problema Eva aunque no lo quería hacer.
? Una persona explicó un problema. Y

filler 18 a
A Iván le vendió una bicicleta Bruno y ahora la usa todos los días.
? La bicicleta se usa siete días a la semana. Y

filler 19 a
A Julio le sacó la lengua Agustín para burlarse de él.
? Alguien sacó su lengua para comer. N

filler 20 a
A Clara le criticó el ensayo Alexia después de leerlo.
? Alguien leyó un libro. N

filler 21 a
A Josué le devolvió el libro Ramón después de usarlo para una clase.
? Una persona devolvió una película. N

filler 22 a
A Rosa le puso agua bendita Vanesa cuando entró en la iglesia.
? Algo pasó en un parque. N

filler 23 a

A Óscar le compró un regalo Enrique para el día de San Valentín.
? El regalo era para Navidad. N

filler 24 a
A Josefa le quitó el reloj Guadalupe porque el suyo se rompió ayer.
? Algo se rompió ayer. N

filler 25 a
Las corredoras que el conductor va a saludar siempre responden "hola".
? El conductor saludará a las corredoras. Y

filler 26 a
El empresario que la activista va a criticar no cuida el medioambiente.
? Al empresario no le importa el medioambiente. Y

filler 27 a
Las autoras que el bibliotecario va a recomendar son populares.
? Mucha gente conoce a las autoras. Y

filler 28 a
El paciente que la doctora va a examinar prefiere terapias alternativas.
? El paciente no prefiere las terapias estándares. Y

filler 29 a
El hombre que la mujer va a seducir está vestido de negro.
? La mujer está vestida de negro. N

filler 30 a
La intérprete que el diplomático va a necesitar tiene mucha experiencia.
? La intérprete tiene poca experiencia. N

filler 31 a
Las bailarinas que la audiencia va a aplaudir practican mucho.
? Las bailarinas no practican casi nunca. N

filler 32 a
El supervisor que la consejera va a visitar ofrece buenos consejos.
? Los consejos del supervisor son malos. N

Appendix E

Items for within-subject English subject identification task (Chapter 4)

1 a
Logan waved happily and eagerly to Harry at the high school reunion last Thursday.
? It was Harry who waved happily or eagerly. N
1 b
Logan appeared wrinkly and feeble to Harry at the high school reunion last Thursday.
? It was Harry who appeared wrinkly and feeble. N
1 c
To Harry, Logan waved happily and eagerly at the high school reunion last Thursday.
? It was Harry who waved happily and eagerly. N
1 d
To Harry, Logan appeared wrinkly and feeble at the high school reunion last Thursday.
? It was Harry who appeared wrinkly and feeble. N

2 a
Madison waved excitedly and gleefully to Amber in the black and white photo on her desk.
? It was Amber who waved excitedly and gleefully. N
2 b
Madison appeared younger and healthier to Amber in the black and white photo on her desk.
? It was Amber who appeared younger and healthier. N
2 c
To Amber, Madison waved excitedly and gleefully in the black and white photo on her desk.
? It was Amber who waved excitedly and gleefully. N
2 d
To Amber, Madison appeared younger and healthier in the black and white photo on her desk.
? It was Amber who appeared younger and healthier. N

3 a
Steve waved quickly and cheerfully to John from his hospital bed in the recovery wing.
? It was Steve who waved quickly and cheerfully. Y
3 b
Steve appeared sickly and decrepit to John from his hospital bed in the recovery wing.
? It was Steve who appeared sickly and decrepit. Y
3 c
To John, Steve waved quickly and cheerfully from his hospital bed in the recovery wing.
? It was Steve who waved quickly and cheerfully. Y
3 d
To John, Steve appeared sickly and decrepit from his hospital bed in the recovery wing.

? It was Steve who appeared sickly and decrepit. Y

4 a
Wendy waved nervously and timidly to Emma in her grotesque costume at the Halloween bash.
? It was Wendy who waved nervously and timidly. Y
4 b
Wendy appeared horrifying and monstrous to Emma in her grotesque costume at the Halloween bash.
? It was Wendy who appeared horrifying and monstrous. Y
4 c
To Emma, Wendy waved nervously and timidly in her grotesque costume at the Halloween bash.
? It was Wendy who waved nervously and timidly. Y
4 d
To Emma, Wendy appeared horrifying and monstrous in her grotesque costume at the Halloween bash.
? It was Wendy who appeared horrifying and monstrous. Y

5 a
Ralph ran quickly and gracefully to Dylan because they knew each other really well.
? It was Dylan who ran quickly and gracefully. N
5 b
Ralph seemed friendly and polite to Dylan because they knew each other really well.
? It was Dylan who seemed friendly and polite. N
5 c
To Dylan, Ralph ran quickly and gracefully because they knew each other really well.
? It was Dylan who ran quickly and gracefully. N
5 d
To Dylan, Ralph seemed friendly and polite because they knew each other really well.
? It was Dylan who seemed friendly and polite. N

6 a
Megan ran with open arms to Heather as she displayed her huge smile.
? It was Heather who ran with open arms. N
6 b
Megan seemed actually quite approachable to Heather as she displayed her huge smile.
? It was Heather who seemed actually quite approachable. N
6 c
To Heather, Megan ran with open arms as she displayed her huge smile.
? It was Heather who ran with open arms. N
6 d
To Heather, Megan seemed actually quite approachable as she displayed her huge smile.
? It was Heather who seemed actually quite approachable. N

7 a
Jason ran swiftly and deliberately to Alex with his towel cape dangling behind him.
? It was Jason who ran swiftly and deliberately. Y
7 b
Jason seemed silly and childish to Alex with his towel cape dangling behind him.
? It was Jason who seemed silly and childish. Y
7 c
To Alex, Jason ran swiftly and deliberately with his towel cape dangling behind him.
? It was Jason who ran swiftly and deliberately. Y
7 d
To Alex, Jason seemed silly and childish with his towel cape dangling behind him.
? It was Jason who seemed silly and childish. Y

8 a
Grace ran freely and recklessly to Kayla on the outdoor track as she ignored her surroundings.
? It was Grace who ran freely and recklessly. Y
8 b
Grace seemed inattentive and fatigued to Kayla on the outdoor track as she ignored her surroundings.
? It was Grace who seemed inattentive and fatigued. Y
8 c
To Kayla, Grace ran freely and recklessly on the outdoor track as she ignored her surroundings.
? It was Grace who ran freely and recklessly. Y
8 d
To Kayla, Grace seemed inattentive and fatigued on the outdoor track as she ignored her surroundings.
? It was Grace who seemed inattentive and fatigued. Y

9 a
Dennis whispered secretly and mischievously to Jeremy even though they had not known each other long.
? It was Jeremy who whispered secretly and mischievously. N
9 b
Dennis mattered a great deal to Jeremy even though they had not known each other long.
? It was Jeremy who mattered a great deal. N
9 c
To Jeremy, Dennis whispered secretly and mischievously even though they had not known each other long.
? It was Jeremy who whispered secretly and mischievously. N
9 d
To Jeremy, Dennis mattered a great deal even though they had not known each other long.
? It was Jeremy who mattered a great deal. N

10 a
Sharon whispered softly and discreetly to Nicole because they shared an important secret.
? It was Nicole who whispered softly and discreetly. N
10 b
Sharon mattered enormously and deeply to Nicole because they shared an important secret.
? It was Nicole who mattered enormously and deeply. N
10 c
To Nicole, Sharon whispered softly and discreetly because they shared an important secret.
? It was Nicole who whispered softly and discreetly. N
10 d
To Nicole, Sharon mattered enormously and deeply because they shared an important secret.
? It was Nicole who mattered enormously and deeply. N

11 a
Ryan whispered in slurred speech to Ben after their bonding experience at the festival.
? It was Ryan who whispered in slurred speech. Y
11 b
Ryan mattered profoundly and sincerely to Ben after their bonding experience at the festival.
? It was Ryan who mattered profoundly and sincerely. Y
11 c
To Ben, Ryan whispered in slurred speech after their bonding experience at the festival.
? It was Ryan who whispered in slurred speech. Y
11 d
To Ben, Ryan mattered profoundly and sincerely after their bonding experience at the festival.
? It was Ryan who mattered profoundly and sincerely. Y

12 a
Courtney whispered with great affection to Michelle after her bridesmaid speech at the wedding.
? It was Courtney who whispered with great affection. Y
12 b
Courtney mattered more than anything to Michelle after her bridesmaid speech at the wedding.
? It was Courtney who mattered more than anything. Y
12 c
To Michelle, Courtney whispered with great affection after her bridesmaid speech at the wedding.
? It was Courtney who whispered with great affection. Y
12 d

To Michelle, Courtney mattered more than anything after her bridesmaid speech at the wedding.
? It was Courtney who mattered more than anything. Y

13 a
Thomas called loudly and powerfully to Jeffrey at the party last weekend.
? It was Jeffrey who called loudly and powerfully. N
13 b
Thomas smelled overwhelmingly of cologne to Jeffrey at the party last weekend.
? It was Jeffrey who smelled overwhelmingly of cologne. N
13 c
To Jeffrey, Thomas called loudly and powerfully at the party last weekend.
? It was Jeffrey who called loudly and powerfully. N
13 d
To Jeffrey, Thomas smelled overwhelmingly of cologne at the party last weekend.
? It was Jeffrey who smelled of overwhelmingly of cologne. N

14 a
Judy called longingly and warmly to Betty when they met up after a long time.
? It was Betty who called longingly and warmly. N
14 b
Judy smelled surprisingly quite good to Betty when they met up after a long time.
? It was Betty who smelled surprisingly quite good. N
14 c
To Betty, Judy called longingly and warmly when they met up after a long time.
? It was Betty who called longingly and warmly. N
14 d
To Betty, Judy smelled surprisingly quite good when they met up after a long time.
? It was Betty who smelled surprisingly quite good. N

15 a
Andrew called enthusiastically and boldly to Bill during the soccer game at the park.
? It was Andrew who called enthusiastically and boldly. Y
15 b
Andrew smelled vaguely of alcohol to Bill during the soccer game at the park.
? It was Andrew who smelled vaguely of alcohol. Y
15 c
To Bill, Andrew called enthusiastically and boldly during the soccer game at the park.
? It was Andrew who called enthusiastically and boldly. Y
15 d
To Bill, Andrew smelled vaguely of alcohol during the soccer game at the park.
? It was Andrew who smelled vaguely of alcohol. Y

16 a
Erin called hopelessly and shakily to Allison after the spill in the science lab.

? It was Erin who called hopelessly and shakily. Y
16 b
Erin smelled like toxic chemicals to Allison after the spill in the science lab.
? It was Erin who smelled like toxic chemicals. Y
16 c
To Allison, Erin called hopelessly and shakily after the spill in the science lab.
? It was Erin who called hopelessly and shakily. Y
16 d
To Allison, Erin smelled like toxic chemicals after the spill in the science lab.
? It was Erin who smelled like toxic chemicals. Y

17 a
Randy replied sharply and crudely to Austin during their recent Skype call.
? It was Austin who replied sharply and crudely. N
17 b
Randy sounded heartbroken and lonely to Austin during their recent Skype call.
? It was Austin who sounded heartbroken and lonely. N
17 c
To Austin, Randy replied sharply and crudely during their recent Skype call.
? It was Austin who replied sharply and crudely. N
17 d
To Austin, Randy sounded heartbroken and lonely during their recent Skype call.
? It was Austin who sounded heartbroken and lonely. N

18 a
Hannah replied punctually and professionally to Teresa during the conference call this morning.
? It was Teresa who replied punctually and professionally. N
18 b
Hannah sounded wheezy and breathless to Teresa during the conference call this morning.
? It was Teresa who sounded wheezy and breathless. N
18 c
To Teresa, Hannah replied punctually and professionally during the conference call this morning.
? It was Teresa who replied punctually and professionally. N
18 d
To Teresa, Hannah sounded wheezy and breathless during the conference call this morning.
? It was Teresa who sounded wheezy and breathless. N

19 a
Noah replied obnoxiously and irritably to Aaron when he found out the terrible news.
? It was Noah who replied obnoxiously and irritably. Y
19 b

Noah sounded unhappy and frightened to Aaron when he found out the terrible news.
? It was Noah who sounded unhappy and frightened. Y
19 c
To Aaron, Noah replied obnoxiously and irritably when he found out the terrible news.
? It was Noah who replied obnoxiously and irritably. Y
19 d
To Aaron, Noah sounded unhappy and frightened when he found out the terrible news.
? It was Noah who sounded unhappy and frightened. Y

20 a
Molly replied impatiently and frankly to Melissa while talking on the phone yesterday.
? It was Molly who replied impatiently and frankly. Y
20 b
Molly sounded melancholy and sleepy to Melissa while talking on the phone yesterday.
? It was Molly who sounded melancholy and sleepy. Y
20 c
To Melissa, Molly replied impatiently and frankly while talking on the phone yesterday.
? It was Molly who replied impatiently and frankly. Y
20 d
To Melissa, Molly sounded melancholy and sleepy while talking on the phone yesterday.
? It was Molly who sounded melancholy and sleepy. Y

21 a
Bruce talked calmly and precisely to Robert while standing in the doorway.
? It was Robert who talked calmy and precisely. N
21 b
Bruce looked unattractive and unkempt to Robert while standing in the doorway.
? It was Robert who looked unattractive and unkempt. N
21 c
To Robert, Bruce talked calmly and precisely while standing in the doorway.
? It was Robert who talked calmy and precisely. N
21 d
To Robert, Bruce looked unattractive and unkempt while standing in the doorway.
? It was Robert who looked unattractive and unkempt. N

22 a
Kelly talked for several minutes to Marie during the high-stakes interview.
? It was Marie who talked for several minutes. N
22 b
Kelly looked confident and prepared to Marie during the high-stakes interview.
? It was Marie who looked confident and prepared. N
22 c
To Marie, Kelly talked for several minutes during the high-stakes interview.
? It was Marie who talked for several minutes. N
22 d

To Marie, Kelly looked confident and prepared during the high-stakes interview.
? It was Marie who looked confident and prepared. N

23 a
Blake talked gleefully and hastily to Lucas at the speed-dating event last night.
? It was Blake who talked gleefully and hastily. Y
23 b
Blake looked handsome and stylish to Lucas at the speed-dating event last night.
? It was Blake who looked handsome and stylish. Y
23 c
To Lucas, Blake talked gleefully and hastily at the speed-dating event last night.
? It was Blake who talked gleefully and hastily. Y
23 d
To Lucas, Blake looked handsome and stylish at the speed-dating event last night.
? It was Blake who looked handsome and stylish. Y

24 a
Breanna talked sincerely and openly to Leah at the Alcoholics Anonymous meeting over the weekend.
? It was Breanna who talked sincerely and openly. Y
24 b
Breanna looked pale and malnourished to Leah at the Alcoholics Anonymous meeting over the weekend.
? It was Breanna who looked pale and malnourished. Y
24 c
To Leah, Breanna talked sincerely and openly at the Alcoholics Anonymous meeting over the weekend.
? It was Breanna who talked sincerely and openly. Y
24 d
To Leah, Breanna looked pale and malnourished at the Alcoholics Anonymous meeting over the weekend.
? It was Breanna who looked pale and malnourished. Y

filler 1 a
Again and again, the hardy farmer planted green beans in his garden outside the barn.
? It was the nurse that planted green beans. N
filler 1 b
Again and again, the hardy farmer planted green beans in his garden outside the barn.
? It was the nurse that planted green beans. N
filler 1 c
The hardy farmer planted green beans, again and again, in his garden outside the barn.
? It was the nurse that planted green beans. N
filler 1 d
The hardy farmer planted green beans, again and again, in his garden outside the barn.
? It was the nurse that planted green beans. N

filler 2 a
Every single day, the young sailor towed the ship to the port in the marina.
? It was the young sailor who towed the ship. Y
filler 2 b
Every single day, the young sailor towed the ship to the port in the marina.
? It was the young sailor who towed the ship. Y
filler 2 c
The young sailor towed the ship, every single day, to the port in the marina.
? It was the young sailor who towed the ship. Y
filler 2 d
The young sailor towed the ship, every single day, to the port in the marina.
? It was the young sailor who towed the ship. Y

filler 3 a
Time after time, the jolly chef baked his cakes in the oven of the kitchen.
? Did an angry nun bake cakes? N
filler 3 b
Time after time, the jolly chef baked his cakes in the oven of the kitchen.
? Did an angry nun bake cakes? N
filler 3 c
The jolly chef baked his cakes, time after time, in the oven of the kitchen.
? Did an angry nun bake cakes? N
filler 3 d
The jolly chef baked his cakes, time after time, in the oven of the kitchen.
? Did an angry nun bake cakes? N

filler 4 a
For some time, the romantic poet wrote loving sonnets to his lover in the castle.
? The poet wrote love sonnets. Y
filler 4 b
For some time, the romantic poet wrote loving sonnets to his lover in the castle.
? The poet wrote love sonnets. Y
filler 4 c
The romantic poet wrote loving sonnets, for some time, to his lover in the castle.
? The poet wrote love sonnets. Y
filler 4 d
The romantic poet wrote loving sonnets, for some time, to his lover in the castle.
? The poet wrote love sonnets. Y

filler 5 a
Up until now, the rustic cowboy corralled runaway cattle outside the ranch in Texas.
? The cowboy lived in Oklahoma. N
filler 5 b
Up until now, the rustic cowboy corralled runaway cattle outside the ranch in Texas.

? The cowboy lived in Oklahoma. N
filler 5 c
The rustic cowboy corralled runaway cattle, up until now, outside the ranch in Texas.
? The cowboy lived in Oklahoma. N
filler 5 d
The rustic cowboy corralled runaway cattle, up until now, outside the ranch in Texas.
? The cowboy lived in Oklahoma. N

filler 6 a
After some time, the physics professor lectured his students in the classroom of the university.
? The professor taught physics. Y
filler 6 b
After some time, the physics professor lectured his students in the classroom of the university.
? The professor taught physics. Y
filler 6 c
The physics professor lectured his students, after some time, in the classroom of the university.
? The professor taught physics. Y
filler 6 d
The physics professor lectured his students, after some time, in the classroom of the university.
? The professor taught physics. Y

filler 7 a
At long last, the police inspector interrogated the prisoner at the station in downtown Chicago.
? It was the inspector who was interrogated. N
filler 7 b
At long last, the police inspector interrogated the prisoner at the station in downtown Chicago.
? It was the inspector who was interrogated. N
filler 7 c
The police inspector interrogated the prisoner, at long last, at the station in downtown Chicago.
? It was the inspector who was interrogated. N
filler 7 d
The police inspector interrogated the prisoner, at long last, at the station in downtown Chicago.
? It was the inspector who was interrogated. N

filler 8 a
In the morning, the successful fisherman caught several fish in the sea outside the city.
? The fisherman did his fishing outside the city. Y

filler 8 b
In the morning, the successful fisherman caught several fish in the sea outside the city.
? The fisherman did his fishing outside the city. Y
filler 8 c
The successful fisherman caught several fish, in the morning, in the sea outside the city.
? The fisherman did his fishing outside the city. Y
filler 8 d
The successful fisherman caught several fish, in the morning, in the sea outside the city.
? The fisherman did his fishing outside the city. Y

filler 9 a
Every so often, the film critic watched new movies in the theater at the mall.
? The film critic watched old movies at the mall. Y
filler 9 b
Every so often, the film critic watched new movies in the theater at the mall.
? The film critic watched old movies at the mall. Y
filler 9 c
The film critic watched new movies, every so often, in the theater at the mall.
? The film critic watched old movies at the mall. Y
filler 9 d
The film critic watched new movies, every so often, in the theater at the mall.
? The film critic watched old movies at the mall. Y

filler 10 a
Always when possible, the skilled lumberjack chopped pine trees in the forest outside the village.
? It was maple trees that the lumberjack chopped. N
filler 10 b
Always when possible, the skilled lumberjack chopped pine trees in the forest outside the village.
? It was maple trees that the lumberjack chopped. N
filler 10 c
The skilled lumberjack chopped pine trees, always when possible, in the forest outside the village.
? It was maple trees that the lumberjack chopped. N
filler 10 d
The skilled lumberjack chopped pine trees, always when possible, in the forest outside the village.
? It was maple trees that the lumberjack chopped. N

filler 11 a
In the evening, the cake artist spread fresh icing with his knife near the counter.
? The icing the cake artist used was stale. N
filler 11 b
In the evening, the cake artist spread fresh icing with his knife near the counter.

? The icing the cake artist used was stale. N
filler 11 c
The cake artist spread fresh icing, in the evening, with his knife near the counter.
? The icing the cake artist used was stale. N
filler 11 d
The cake artist spread fresh icing, in the evening, with his knife near the counter.
? The icing the cake artist used was stale. N

filler 12 a
In the afternoon, the hired magician performed magic tricks for the party at the house.
? The magician was paid for performing tricks. Y
filler 12 b
In the afternoon, the hired magician performed magic tricks for the party at the house.
? The magician was paid for performing tricks. Y
filler 12 c
The hired magician performed magic tricks, in the afternoon, for the party at the house.
? The magician was paid for performing tricks. Y
filler 12 d
The hired magician performed magic tricks, in the afternoon, for the party at the house.
? The magician was paid for performing tricks. Y

filler 13 a
Six months ago, the accomplished weightlifter broke a record at the gym in the city.
? The weightlifter broke a record seven months ago. N
filler 13 b
Six months ago, the accomplished weightlifter broke a record at the gym in the city.
? The weightlifter broke a record seven months ago. N
filler 13 c
The accomplished weightlifter broke a record, six months ago, at the gym in the city.
? The weightlifter broke a record seven months ago. N
filler 13 d
The accomplished weightlifter broke a record, six months ago, at the gym in the city
? The weightlifter broke a record seven months ago. N

filler 14 a
Now and again, the determined hunter trapped wild tigers in the jungle on the peninsula.
? The hunter trapped a type of large cat. Y
filler 14 b
Now and again, the determined hunter trapped wild tigers in the jungle on the peninsula.
? The hunter trapped a type of large cat. Y
filler 14 c
The determined hunter trapped wild tigers, now and again, in the jungle on the peninsula.
? The hunter trapped a type of large cat. Y
filler 14 d
The determined hunter trapped wild tigers, now and again, in the jungle on the peninsula.

? The hunter trapped a type of large cat. Y

filler 15 a
Here and there, the comic creators addressed adoring fans at the conventions in the center.
? The comic creators were disliked at the convention. N
filler 15 b
Here and there, the comic creators addressed adoring fans at the conventions in the center.
? The comic creators were disliked at the convention. N
filler 15 c
The comic creators addressed adoring fans, here and there, at the conventions in the center.
? The comic creators were disliked at the convention. N
filler 15 d
The comic creators addressed adoring fans, here and there, at the conventions in the center.
? The comic creators were disliked at the convention. N

filler 16 a
All the time, some daring pirates explored uncharted territories with their crews across the globe.
? Pirates explored the world. Y
filler 16 b
All the time, some daring pirates explored uncharted territories with their crews across the globe.
? Pirates explored the world. Y
filler 16 c
Some daring pirates explored uncharted territories, all the time, with their crews across the globe.
? Pirates explored the world. Y
filler 16 d
Some daring pirates explored uncharted territories, all the time, with their crews across the globe.
? Pirates explored the world. Y

filler 17 a
Over the weekend, the crafty plumber fixed the piping with his tools on the spot.
? The unemployed dentist fixed the piping. N
filler 17 b
Over the weekend, the crafty plumber fixed the piping with his tools on the spot.
? The unemployed dentist fixed the piping. N
filler 17 c
The crafty plumber fixed the piping, over the weekend, with his tools on the spot.
? The unemployed dentist fixed the piping. N

filler 17 d
The crafty plumber fixed the piping, over the weekend, with his tools on the spot.
? The unemployed dentist fixed the piping. N

filler 18 a
For three days, the stern blacksmith hammered hot metal on the forge in the hut.
? The blacksmith hammered for three days. Y
filler 18 b
For three days, the stern blacksmith hammered hot metal on the forge in the hut.
? The blacksmith hammered for three days. Y
filler 18 c
The stern blacksmith hammered hot metal, for three days, on the forge in the hut.
? The blacksmith hammered for three days. Y
filler 18 d
The stern blacksmith hammered hot metal, for three days, on the forge in the hut.
? The blacksmith hammered for three days. Y

filler 19 a
During the day, the thirsty kitten drank cold milk from the saucer in the kitchen.
? The kitten drank lukewarm milk. N
filler 19 b
During the day, the thirsty kitten drank cold milk from the saucer in the kitchen.
? The kitten drank lukewarm milk. N
filler 19 c
The thirsty kitten drank cold milk, during the day, from the saucer in the kitchen.
? The kitten drank lukewarm milk. N
filler 19 d
The thirsty kitten drank cold milk, during the day, from the saucer in the kitchen.
? The kitten drank lukewarm milk. N

filler 20 a
All the while, the loyal maid cooked fresh carrots in the pot by the sink.
? The maid cooked near the sink. Y
filler 20 b
All the while, the loyal maid cooked fresh carrots in the pot by the sink.
? The maid cooked near the sink. Y
filler 20 c
The loyal maid cooked fresh carrots, all the while, in the pot by the sink.
? The maid cooked near the sink. Y
filler 20 d
The loyal maid cooked fresh carrots, all the while, in the pot by the sink.
? The maid cooked near the sink. Y

filler 21 a

Whenever they could, the conniving monkeys stole fresh bananas from the tourists on the boat.
? It was children who stole the bananas. N
filler 21 b
Whenever they could, the conniving monkeys stole fresh bananas from the tourists on the boat.
? It was children who stole the bananas. N
filler 21 c
The conniving monkeys stole fresh bananas, whenever they could, from the tourists on the boat.
? It was children who stole the bananas. N
filler 21 d
The conniving monkeys stole fresh bananas, whenever they could, from the tourists on the boat.
? It was children who stole the bananas. N

filler 22 a
Way back when, the handsome hero saved the man from the villain in the mansion.
? The hero was attractive. Y
filler 22 b
Way back when, the handsome hero saved the man from the villain in the mansion.
? The hero was attractive. Y
filler 22 c
The handsome hero saved the man, way back when, from the villain in the mansion.
? The hero was attractive. Y
filler 22 d
The handsome hero saved the man, way back when, from the villain in the mansion.
? The hero was attractive. Y

filler 23 a
Up until recently, the noble samurai defended the village from the bandits of the countryside.
? The samurai still defends the village. N
filler 23 b
Up until recently, the noble samurai defended the village from the bandits of the countryside.
? The samurai still defends the village. N
filler 23 c
The noble samurai defended the village, up until recently, from the bandits of the countryside.
? The samurai still defends the village. N
filler 23 d
The noble samurai defended the village, up until recently, from the bandits of the countryside.
? The samurai still defends the village. N

filler 24 a
From then on, the spoiled patron devoured many dinners in the restaurant outside of town.
? It was a spoiled patron who gorged himself. Y
filler 24 b
From then on, the spoiled patron devoured many dinners in the restaurant outside of town.
? It was a spoiled patron who gorged himself. Y
filler 24 c
The spoiled patron devoured many dinners, from then on, in the restaurant outside of town.
? It was a spoiled patron who gorged himself. Y
filler 24 d
The spoiled patron devoured many dinners, from then on, in the restaurant outside of town.
? It was a spoiled patron who gorged himself. Y

filler 1 a
The businessman that the activist is going to criticize doesn't worry about the environment.
? The businessman does not care about the environment. Y

filler 2 a
The authors that the librarian is going to recommend are popular.
? The authors are well known. Y

filler 3 a
The barman that the mechanic is going to see after work is handsome.
? The mechanic is going to see someone before work. N

filler 4 a
The scientist that the professor is going to invite to the event is intelligent.
? The scientist is dumb. N

filler 5 a
Albert offered a dollar to Hector but he didn't accept it.
? The dollar was not accepted. Y

filler 6 a
Edward gave a kiss to Phillip at the party when no one was looking.
? Everyone saw the kiss. N

filler 7 a
To Carly, Eva explained the problem even though she didn't want to do it.

? Someone explained a problem. Y

filler 8 a
To Randall, Greg loaned a car so he could go to Wisconsin.
? Someone planned to go to Iowa. N