SOURCES OF PERFORMANCE AND PROCESSING ERRORS IN NEAR-NATIVE L2 SPANISH SPEAKERS, L1 Farsi

By

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To my family, friends and academic mentors that have supported me during my graduate studies
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While normal child language acquisition results in complete productive and comprehension abilities at a relatively young age, adult language acquisition is more belabored and often results in linguistic abilities that differ from those of native speakers in terms of both productive and comprehension abilities. A major line of research in language acquisition studies seeks to determine and explain potential causes of these differences. One current and influential hypothesis, the Interface Hypothesis (Sorace 2011), claims that dissimilarities are a product of the increased cognitive load experienced by bilinguals. That is, since bilinguals possess two grammars, they must simultaneously inhibit one language while activating the other. As a consequence of the increased cognitive load, the Interface Hypothesis predicts that bilinguals will show differences on properties requiring integration of purely linguistic information (e.g. syntax) with extralinguistic information (e.g. discourse or pragmatics). I test this prediction in near-native adult second language acquirers of Spanish who are native speakers of Farsi using offline tasks measuring grammatical accuracy and interpretation of referential and expletive subject pronouns as well as online tasks measuring language processing. The particular participant group, linguistic properties and combination of offline and online experimental methodology are especially relevant to the debate surrounding near-native speaker ultimate
attainment potential and bilingual processing. That is, the experimental group participants meet
the requirements of the Interface Hypothesis in that they are highly fluent second language
speakers that have lived in a Spanish-speaking environment for over 30 years. While the
language pairing is quite novel, the linguistic property examined is interesting in that Spanish
and Farsi are both null subject languages with analogous discourse distributions of subject
pronouns. However, the underlying syntax of each language differs therefore necessitating
restructuring in order for the speakers to converge on the syntax of subjects in Spanish. Finally,
employing both offline and online measures makes it possible to test the Interface Hypothesis’s
claim that bilingual processing is different from monolingual processing. The results, which
provide mixed evidence regarding the claims of the Interface Hypothesis in that differences were
found, but they were not isolated to overt subject pronouns, inform the field of linguistics
regarding the human capacity for language acquisition, but also have significant implications for
psycholinguistics, cognitive science and language teaching.
CHAPTER 1
OPENING TO THE DISSERTATION

1.1 General Introduction

This dissertation examines the acquisition of syntactic and external interface-conditioned properties related to the Null Subject Parameter (NSP) in near-native naturalistic adult second language (L2) acquirers who are native (L1) speakers of Farsi. Results from two offline and two online tasks provide judgments and real-time processing data regarding the participants’ knowledge of subject distribution in Spanish. The participants and methodological design were specifically constructed to test the Interface Hypothesis (IH; Sorace 2011), which predicts that processing differences will obtain for near-native speakers for external-interface conditioned linguistic properties even if the speakers have converged upon the related syntactic property. With this information in mind, the following sections of Chapter 1 outline the research problem, research proposal and research questions. Before detailing these points, a brief overview of the basics of L1 acquisition in childhood is provided as adult L2 acquisition studies are often introduced against this backdrop for comparative purposes.

1.2 Child L1 versus Adult L2 Acquisition

A salient difference that obtains when comparing child L1 acquisition with adult L2 acquisition is ultimate attainment, or the final result of in the process of language acquisition. Research shows that first language acquisition, despite its complex nature, is the only cognitive-based task for which all humans, regardless of intelligence, socio-economic status and/or motivation are universally successful (e.g. Hyams 1986; Guasti 2002; White 2003a; O’Grady 2005; Sakai 2005; Lust 2006). Chomsky (1965, 1981) explained this feat by proposing that human beings are endowed with an innate language acquisition device enabling them to converge on the grammar to which they are exposed despite the fact that the available linguistic
input is described as being of “degenerate quality” and “narrowly limited” (Chomsky 165, p. 58). Adult L2 learners, on the other hand, experience widely varying levels of ultimate attainment (see White 2003a). This is not to say that it is impossible for adult L2 learners to have native-like knowledge as much research has shown convergence across different domains of grammar, and, in particular, across properties for which the L1 and L2 differ ruling out L1 transfer (Lozano 2002; Gürel 2006; Iverson, Kempchinsky & Rothman 2008; Rothman 2008a, 2009; Hopp 2009; Ivanov 2009; Bohnacker 2010; Donaldson 2001a, 2011b; Slabakova, Kempchinsky & Rothman 2012 among many others). Rather, the lack of uniform success evidenced in child L1 acquisition must be principally explained.

Within the generative paradigm, research intending to explain the lack of universal success has moved from broad research questions concerning access to UG and the Critical Period Hypothesis (Lenneberg 1967; see Oyama 1976; Coppetiers 1987; Johnson & Newport 1989; Birdsong 1992 for review of early formulations and Long 2005; Rothman 2008b for an updated view), to more specific questions regarding the quantity and quality of input (e.g. Flege, Yeni-Komshian & Liu 1999; Rothman & Iverson 2007; Rothman & Guijarro-Fuentes 2010) and to particular points of vulnerability in adult L2 acquisition (e.g. Sorace 2011). Motivated by the claims of the IH (Sorace 2011), this dissertation explores a specific instance of vulnerability in near-native adult L2 acquisition: differences in the processing of external-interface conditioned properties related to the Null Subject Parameter (NSP).

1.3 The Research Problem

This dissertation assumes the generative framework, including the construct of UG and continued access to UG in adulthood1 (see White 1989, 2003a for evidence supporting this

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1 This is not to ignore theories that assume global impairment (e.g. Bley-Vroman 1990; Clahsen & Hong 1995; Neeleman & Weerman 1997) or local impairment (Hawkins & Chan 1997; Beck 1998; Hawkins & Hattori 2006;
assumption). However, even with full access to UG in adulthood, native-like convergence is not a guaranteed outcome (see Schwartz & Sprouse 2000), as anecdotal evidence from many L2 classrooms shows. Thus, the undeniable differences in ultimate attainment between child L1 acquisition and adult L2 acquisition cannot be and, in fact, are not ignored by theories advocating adult UG-accessibility. Rather, researchers adopting these theories are charged with the responsibility of describing and explaining these differences (see Dekydtspotter, Schwartz & Sprouse 2006). This task is complicated by the empirical evidence demonstrating the success of adult L2 acquirers (White 2003a, 2003b, 2008, 2011a), indicating that it is not the case that this learner group is globally impaired but rather that certain aspects of language appear to be more difficult to converge on than others. Various theoretical proposals over the past decade have attempted to account for specific instances of divergence. For example, the Prosodic Transfer Hypothesis (Goad, White & Steele 2003; Goad & White 2006, 2008) claims that while the underlying representation of morphosyntactic features may be native-like, the prosodic system of the native language may prevent accurate surface feature-to-form production in the second language, crucially, in predictable environments. Another example, the Feature Re-Assembly Hypothesis (Choi & Lardiere 2006; Lardiere 2008, 2009) posits that new feature acquisition is possible, but maintains that some non-convergence obtains as a result of inaccurate featural mappings on the one hand, and the task of reassembling existing L1 formal features, possibly in different feature matrices, to new language specific morphophonological forms in the L2 on the other hand. While this is certainly not an exhaustive list of recent hypotheses, what is common to them is purported accessibility to UG. That is, the source of observed non-convergence is not

Tsimpli & Dimitrakopoulou 2007). For reasons of space and due to the focus of the dissertation, I do not explain these theories.
posited to be a result of inaccessibility to UG, but rather of other factors such as difficulty with morphology, featural mappings and/or prosodic L1 influence.

A complementary approach that has received much empirical attention as of late (cf. Sorace 2011) is the IH2 (see Sorace 2011, 2012 for both the latest version as well as the history of its development), which, as it relates to adult L2 acquisition, seeks to explain L1-L2 differences much like the aforementioned hypotheses. Borrowing from psycholinguistics, the IH offers a reasonable method of explaining why some domains of non-native language acquisition seem more belabored than native language acquisition, while still acknowledging the ample evidence demonstrating convergence in adult L2 acquisition (White 2003a, 2003b, 2011a). This reconciliation of facts is possible because the IH does not seek to weigh in on all types of L2 divergence, but rather makes predictions for certain properties that are more likely to demonstrate residual optionality at the level of near-native ultimate attainment. Specifically, the IH targets properties that require the integration of linguistic and cognitive information (i.e. external interface-conditioned properties). Sorace states that vulnerability arises from the presence of two linguistic systems in a single mind. In particular, vulnerability is claimed to be a result of the stress placed on finite cognitive resources (e.g. see Wilson, Keller & Sorace 2009; Sorace 2011). That is, as compared to monolinguals that have but one language to manage, second language acquirers must divide cognitive resources to inhibit the non-relevant language. This creates an extra burden for working memory, executive function and attentional resource allocation. The IH allows for the possibility of convergence on properties related to the narrow syntax by near-native speakers. However, external interface-conditioned properties, due to their

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2 Differently from the approaches outlined above, the IH maintains agnosticism regarding accessibility to UG.

3 This is not to say that the other divergence accounts listed above predict across-the-board divergence; more precisely, evidence in favor of the null hypothesis for the majority of these accounts has been found, weakening their empirical strength and explanatory power.
combination of both linguistic and general cognitive information, are predicted to be more costly in terms of processing, and thus, points of vulnerability in bilingualism (Sorace 2011 and sources cited therein such as Pinango, Burkhardt, Brun, & Avrutin 2001; Burkhardt 2005; Pinango & Burkhardt 2005; see Section 2.2.5 for further details).

To date there is no consensus on the tenability of the IH (see Montrul 2011; Rothman & Slabakova 2011; Slabakova 2011; White 2011b). Nevertheless, the IH has proven to be largely influential in the field of generative L2 acquisition over the past decade, spurring much empirical investigation. In addition to stimulating innovative research and collaboration across sub-disciplines, the IH also stands to inform the field’s understanding of the nature of human language since it addresses the source and cause of specific asymmetrical performances between highly proficient (near-native) bilinguals and monolinguals. The following section outlines how this dissertation tests the explanatory predictions of the IH.

1.4 The Research Proposal

In an attempt to identify and isolate potential sources of non-convergence in adult L2 acquisition, this dissertation tests the competence and performance of an immigrant community living in Argentina, specifically, L1 Farsi speakers who are near-native naturalistic learners of L2 Spanish, on two properties related to the NSP. To this end, the theoretical and predictive power of the IH is tested. As the IH permits different predictions for purely syntactic properties as compared to related external interface-conditioned properties, namely syntax-discourse constraints, both types of properties are tested. Farsi and Spanish are both syntactic-discourse configurational null subject languages, meaning that pro is licensed and available in each language. While a syntactic difference exists between the two languages (Spanish, but not Farsi, permits null expletives (Karimi 2005)), the semantic and discourse interface-conditioned properties associated with the null-subject setting have been shown to be analogous across both
languages (Judy & Feizmohammadpour 2012), at least for the properties examined herein4. While the IH does not preclude transfer of the L1 value from allowing for convergence on the syntactic properties related to the NSP, the same is not true for the related external interface-conditioned properties. That is to say, the IH predicts vulnerability on external interface-conditioned properties despite the identical nature of these properties in Farsi and Spanish. This is due to the fact that the source of vulnerability is purported to be the presence of two grammars itself and, importantly, not only language-specific differences. Previous research, which employed offline tasks and varied with respect to proficiency level, examining convergence on subject distribution in two null subject languages produced conflicting results. For example, Bini (1993), Margaza & Bel (2006) and García-Alcaraz & Bel (2011) reported an overuse of overt subject pronouns in Spanish-speaking learners of Italian and Greek-speaking learners of Spanish and Dariya-speaking learners of Spanish, respectively. Similarly, the older Spanish-Italian bilinguals of Sorace et al. (2009) demonstrated overuse of overt subject pronouns when compared to monolingual children and younger bilinguals. Neither Lozano (2002) nor Prada Pérez (2009), on the other hand, reports overuse of overt subjects in L1 Greek learners of L2 Spanish for internal-interface conditioned properties related to the Overt Pronoun Constraint or in subject distribution of Spanish-Catalan and Catalan-Spanish bilinguals. Finally, Prada Pérez (2010) established that word order as a function of focus (an external-interface conditioned property) was not problematic for the Catalan-Spanish bilinguals tested therein. While the present study also examines speakers of two null subject languages, it contributes to a gap in the

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4 Differences have been reported for typologically related languages such as Spanish and Italian (Filiaci 2010a, 2010b; Filiaci, Sorace & Carreiras 2013) and Spanish and Catalan (Prada Pérez 2009), as well as among the different dialects of Spanish (Cameron 1996; Lapidus Shin 2006; Otheguy, Zentella & Livert 2007). Thus, future studies may demonstrate that differences between Farsi and Spanish do exist with respect to semantic and discourse-interface conditioned properties.
literature by examining near-native speakers of two null subject languages using both offline and online methodologies. These points are especially important for the claims of the IH.

1.5 The Research Questions

With the research problem and proposal in mind, it is important to consider the research questions guiding the methodological design and data analysis of this dissertation. In general terms, this dissertation seeks to determine if the L2 participants demonstrate native-like knowledge of and processing of the syntactic and discourse distribution of subjects in Spanish. More specifically, and considering the predictions of the IH, the language pairing and the properties tested herein, this dissertation addresses the following research questions:

1. Do near-native L2 learners demonstrate more divergence with respect to external interface-conditioned properties as opposed to purely syntactic ones in the offline tasks? Regarding this research question, the IH predicts that convergence on syntactic properties is possible (but not guaranteed) in adult L2 acquisition; however, because external interface-conditioned properties require the integration of strictly linguistic information and discourse information, the IH predicts differences between native speakers and adult near-native L2 learners. As described above in Section 1.4, pro is licensed and identifiable in both Spanish and Farsi, making them syntactic-discourse configurational null subject languages. Furthermore, their semantic and discourse distribution of overt and null subjects is analogous for the properties tested herein (Judy & Feizmohammadpour 2012). In spite of these similarities, the IH predicts vulnerability on external interface-conditioned properties, such as the discourse distribution of overt and null subjects, since it is claimed that the presence of two grammars, and not differences/similarities between the two languages, is the source of divergence. Thus, the IH would not predict convergence on external interface-conditioned properties but divergence on purely syntactic properties. Previous research employing offline tasks supports this prediction in language pairings that are non-facilitative for transfer since studies have shown convergence on
the syntax of null subjects for English-speaking learners of L2 Turkish (Gürel 2006), English-speaking learners of L2 Italian (Sorace & Filiaci 2006) and English-speaking learners of L2 Spanish (Rothman 2008a, 2009), yet mixed results obtained across these and other studies with respect to convergence on the discourse distribution of overt and null referential subjects. For example, Rothman (2009) found that advanced L2 learners converged on subject distribution in Contrastive Focus and Topic Maintenance tokens, while Sorace & Filiaci (2006) found divergence with respect to the interpretation of overt subject pronouns in forward and backward anaphora tokens. Nonetheless, and as mentioned above, studies examining convergence on subject-related properties in speakers of two null subject languages, for language pairings in which L1 transfer might benefit the learner, also produced varied results in that an overuse of overt subjects was reported in Bini (1993), Margaza & Bel (2006) and García-Alcaraz & Bel (2011). Still, Lozano (2002) and Prada Pérez (2009, 2010) reported convergence among speakers of two null subject languages. Taken together, this body of studies points to a more complex acquisition situation, one that is not solely predicated on language pairing or property, but rather is likely dependent on proficiency level and testing measures. The second research question considers the same topic in online tasks examining processing.

2. Do near-native L2 learners exhibit greater processing difficulties with external interface-conditioned properties as compared to purely syntactic ones in online tasks? Here, processing difficulties for external interface-conditioned properties are expected under the IH, but processing differences on purely syntactic properties are neither strictly expected nor precluded. Therefore, the IH predicts that adult near-native L2 learners will demonstrate processing differences (e.g. slower reaction times (RTs)) with respect to external interface-conditioned properties and that differences in RTs may also be evidenced for purely syntactic properties. It would be odd, under the IH, for processing differences to be evidenced
with respect to purely syntactic properties, but not external interface-conditioned properties.

Finally, the third research question examines testing modality.

3. Do near-native L2 learners perform more native-like in offline tasks as compared to online tasks?

Since the locus of divergence predicted to obtain in adult near-native L2 learners is taken to be language processing, more native-like performance is expected for the offline tasks as compared to the online tasks, although it is possible that non-native-like performance is evidenced in both tasks. It seems that finding more native-like performance in online tasks as compared to offline tasks would be unexpected by the IH, though, should this result obtain, metalinguistic awareness could be taken as a variable.

With these research questions in mind, the following chapter describes relevant background information regarding the IH and previous research pertinent to the current study. Chapter 3 describes the syntax of the linguistic property examined herein, while Chapter 4 presents the experimental methodology employed in the study. Finally Chapter 5 discusses the results of each of the four experimental tasks and the significance of the results is discussed in light of research questions in Chapter 6.
CHAPTER 2
BACKGROUND INFORMATION AND PREVIOUS STUDIES

2.1 General Introduction

The goal of this chapter is to present necessary background information regarding the theoretical assumptions adopted in the study as well as to present previous empirical research spanning offline and online methodologies. To this end, the chapter begins with a description of the Interface Hypothesis (IH; Sorace 2011). Next in Section 2.3, previous offline behavioral research providing evidence both for and against the claims made by the IH is described. While offline research of this type is ultimately unable to provide evidence for or against the claims of the IH, reviewing this research is nonetheless necessary as it has informed previous versions of the IH as well as shaped the goals and methodologies of the current study. Following Section 2.3, the general topic of language processing, including the parsing model assumed herein, language processing methodologies and previous neurophysiological and online behavioral studies, are presented in Section 2.4. Criticisms of both the offline and online research are provided after each respective subsection. Finally, a proposal for methodologies that more effectively test the IH’s predictions is outlined in Section 2.5.

2.2 Interface Hypothesis

The following sections describe the IH, inclusive of a brief history of the hypothesis, a modern conceptualization of the term “interface” and the changes the hypothesis has undergone over the years as a result of empirical investigation. The predictions made by the IH are also described as well as the purported source of vulnerability.

2.2.1 Genesis and Purpose of the Interface Hypothesis

The IH was originally proposed by Sorace (2005, 2006) as a hypothetical way to explain the divergence and residual optionality observed in highly advanced second language learners.
As explained by Slabakova et al. (2012), it brings together “formal linguistic analysis with research and concepts from psychology (and cognitive science more generally), building on the notion of interfaces to propose a theory of possible SLA attainment.” Sorace (2011) claims that the IH is agnostic\(^1\) about the debate concerning accessibility to Universal Grammar, although it will be shown in Section 2.1.2 that the concept of interfaces is entirely consistent with Universal Grammar.

While the term “Interface Hypothesis” was not formally coined until 2006 (Sorace & Filiaci 2006), Sorace (1993) is perhaps the first study that brought the terms “divergence,” “residual optionality” and “near-native” speakers to the linguistic arena. In Sorace’s (1993) study of native speakers of French and English learning Italian as a second language, two different types of non-convergent intuitional patterns regarding syntactic and semantic properties related to unaccusativity and clitic climbing were found between the two experimental participant groups. The native French-speaking participants demonstrated divergence\(^2\) while the native English-speaking participants demonstrated incomplete or indeterminate knowledge. Divergence was described as judgments that differed from those of native speakers while incomplete or indeterminate knowledge was viewed as the inability to produce determinate judgments. Perhaps more importantly, Sorace shed light on the term “near-native” noting that the term intrinsically implies some sort of failure or shortcoming with respect to convergence on the target language. However, Hyltenstam and Abrahamsson (2003) correctly point out that these

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\(^1\) While the Interface Hypothesis claims that narrow syntactic properties, as opposed to interface-conditioned properties, should be unproblematic, no direct claims are made about the exact nature of the underlying representation of these properties. Thus, it is possible that the underlying representation is not native-like or that domain-general learning mechanisms are employed, ultimately producing target-like knowledge at the surface level. However, if the latter scenario were true, it is unclear how semantic properties that fall out of syntax are accurately converged on, as the literature amply shows (see Rothman 2008; Slabakova 2008 and sources cited therein).

\(^2\) But see Sorace (2011, p. 10) and Sorace (2005, p. 18ff) for different interpretations of the results.
failures/shortcomings might only be exposed in near-native speakers via scrutinious and specific methodologies, a position that has influenced the methodological practices of researchers investigating the IH (see Sections 2.3 and 2.4 for details).

2.2.2 Conceptualization of Interfaces

To understand the claims of the IH, it is first necessary to examine the mechanics of linguistic interfaces and differentiate among the uses of the term in linguistics. To begin, it must be mentioned that the contemporary use of “interface” is distinct from perhaps its earliest use in Principles and Parameters (Chomsky 1981, 1986) and its later use in the Minimalist Program (Chomsky 1995). In the Principles and Parameters program, it was claimed that syntax “interfaced” with other modules (Phonological Form and Logical Form) and that compliance between syntactic computations and interface conditions was necessary in order for the derivation to survive. Similarly, in the Minimalist Program (Chomsky 1995, 2000, 2001) syntactic operations must satisfy interface conditions related to the conceptual-intentional interface (semantics) and the perceptual interface (phonological). In these programs, interfaces were levels of representation that permitted language to accomplish its function of bringing together linguistic form and meaning for communicative purposes.

Yet, Ramchand and Reiss (2007) and Rothman and Slabakova (2011), among others, call attention to the fact that the strictly linguistic domains that map form with meaning also interact with extralinguistic domains such as discourse and context. This suggests that other interfaces between purely linguistic modules and cognition must exist in order for language’s communicative function to be meaningful and anchored. Uncovering the nature of both language-specific interfaces as well as those that interface with cognition and how they interact stands to provide key insights into our understanding of the nature of language. Conceivably, it is for this reason that a number of proposals attempting to describe interfaces and their interactions
have been set forth in recent years (Jackendoff 2002; Burkhardt 2005; Ramchand & Reiss 2007; Reinhart 2006). Reinhart’s (2006) schematization of interfaces is likely the most mainstream, possibly due to its syntactocentric design (as compared to Jackendoff’s 2002 design).

As is straightforwardly seen in Figure 2-1, the Computational System (syntax) forms the nucleus of Reinhart’s design. It is the only system to interface with all other areas, lending it a privileged position. Reinhart claims that difficulties with interfaces arise as the result of reference set computations saying that comparing two or more possible syntactic derivations is burdensome on the language learner. This can be easily extended to both child and adult acquisition, effectively increasing its explanatory power. However, one drawback of Reinhart’s (2006) design is that it does not clearly differentiate between internal and external interfaces, an important concept in studies investigating the IH (especially since Sorace & Filiaci 2006; Sorace & Serratrice 2009; Tsimpili & Sorace 2006). White’s (2009) model (Figure 2-2) remedies this
drawback by separating the purely linguistic modules (seen in the upper, light gray boxes) from extralinguistic information (seen in the lower, dark gray box).

Figure 2-2. White’s (2009) Working Interface Design

To recapitulate, assuming a syntactocentric nature of language, interfaces are syntactic structures that must meet minimum conditions determined by other modules (either internal or external) in order for the structure to be grammatical/felicitous. Importantly, the purported interaction between language and extralinguistic cognition is not incompatible with the assumed modularity of language proposed by Universal Grammar.

2.2.3 Evolution of the Interface Hypothesis

Like most theories and hypotheses, the IH has evolved over the years as empirical investigation informs the hypothesis\(^3\). White (2011a) differentiates between two versions of the IH, although a third and more recent version will also be described herein. The first version juxtaposed narrow syntax with interface properties, claiming that only the former was immune to vulnerability in second language acquisition (Sorace 2005, 2006). The second version separated purely linguistic (internal) interfaces from those that interface with cognition (external

\(^3\) While empirical research informs the Interface Hypothesis, one criticism of it is that the argument is circular: vulnerability is predicted where it is found (Duffield 2011).
interfaces) while narrow syntax maintained its privileged status (Sorace & Filiaci 2006; Sorace & Serratrice 2009; Tsimpli & Sorace 2006). Specifically, the second version claimed that external interfaces posed greater difficulties than internal interfaces. There are two commonalities across both early versions: (i) narrow syntax is not predicted to be a source of inevitable vulnerability while, conversely, (ii) external interfaces are predicted to be a source of inevitable vulnerability. As such, the past decade of research has witnessed a marked increase in studies investigating whether adult second language learners converge on properties lying at the syntax-semantics, syntax-pragmatics and syntax-semantics-pragmatics interfaces (see Slabakova 2006, 2008; Sorace 2011 and sources cited therein). In a sense, the IH (and studies conducted under its banner) seeks to describe second language acquisition potential by simultaneously explaining observed divergence in non-native language acquisition and isolating the upper limits of second language acquisition. Currently, syntax-pragmatics is often seen as the benchmark.

In its most recent form (Sorace 2011), the IH maintains that only properties conditioned upon external interfaces are subject to vulnerability in second language acquisition. Different from earlier versions, language pairing is ruled out as constituting the only deterministic factor in second language learners’ potential for convergence (Sorace 2011; Sorace & Serratrice 2009). Rather, the current version places the locus of vulnerability on the presence of two linguistic systems, which purportedly prevents second language learners from processing the target language as monolinguals do. According to Sorace (2011), the problem’s source is likely found in the distribution of finite cognitive resources (e.g. the limitations in attentional resources related to inhibitory control (e.g. Green 1986, 1998)). As compared to monolinguals who have but one language to manage, cognitive resources must be divided by second language learners to inhibit the non-relevant language, among other things, creating an extra burden for working
memory, executive function and attentional resource allocation. A further clarification was made regarding the IH’s predictions for development. Sorace (2011) points out that the IH is often mistakenly applied to intermediate stages of second language development and reiterates that its predictions are valid for near-native speakers only (but see Slabakova 2008; White 2009, 2011b; Lardiere 2011 for compelling counterarguments).

2.2.4 Predictions

The most recent instantiation of the IH predicts that near-native speakers of a second language will demonstrate vulnerability/residual optionality with respect to properties lying at external interfaces only. That is to say, syntactic properties and those properties lying at internal interfaces are not predicted to be a source of inevitable vulnerability for near-native speakers. Sorace states that “both syntactic and pragmatic conditions are acquirable” but that “the integration of syntactic and pragmatic conditions remains less than optimally efficient and gives rise to optionality” (Sorace 2011, p. 26; also see Lardiere 2000, 2007, 2008, 2009; Slabakova 2009).

2.2.5 Locus of Vulnerability

The vulnerability predicted with respect to external interface-conditioned properties is seen as the result of processing problems brought about by bilingualism. In effect, it is claimed that the presence of two grammars is burdensome for bilinguals since one grammar must be deactivated or inhibited while the other is employed (i.e. Inhibitory Control, Green 1986, 1998). The cognitive resources expended for deactivation/inhibition renders memory systems, executive function and attentional resource allocation less efficient. Since evidence suggests that all languages are concurrently activated (Green 1986, 1998; Kroll & Stewart 1994; Marian &

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4 Note, however, that White (2011a, p. 578) points out that “one does not acquire levels of representation, since these are part of the grammatical apparatus (given by UG) that language acquirers bring to bear when dealing with the target language.”
Spivey 2003; Costa 2005; Dijkstra 2005; Kroll, Bobb, & Wodniecka 2006; Schwartz, Kroll, & Diaz 2007; Bialystok 2009; Kroll, Bogulski, & McClain 2012 among others), the question as to why only external interface-conditioned properties are affected is raised. As described in Sorace and Tsimpli (2006), purely syntactic computations purportedly require less cognitive-processing resources and internal interface-conditioned properties are entirely grammar-internal. Conversely, the incorporation of linguistic and extralinguistic, or cognitive, information is deemed to be more taxing on processing irrespective of language pairings.

2.3 Previous Behavioral Research

While this dissertation examines properties related to the distribution of overt and null subjects only, the literature review describes interface-conditioned properties related to subjects including overt and null subject distribution as well as word order as the claims of the IH apply to all interface-conditioned properties. The following sections describe current empirical investigations relevant to the IH and the current study. First, studies that provide evidence supporting the claims made by the IH are presented for child bilinguals (Section 2.3.1) and adult bilinguals (Section 2.3.2). These studies are presented by linguistic domain. Section 2.3.3 offers a conclusion of these studies and finally, Section 2.3.4 describes previous studies that provide evidence against the IH. These studies represent adult second language acquisition and are also presented according to the linguistic domain.

2.3.1 Divergence on Interface-conditioned Properties Related to Subjects: Child Studies

While observable differences between native speakers and adult second language speakers have been cited for certain linguistic properties, so too has evidence suggesting native-like convergence. Thus, in an attempt to, first, isolate which areas prove most problematic and, second, explain the potential cause of the observed differences, recent empirical investigations
have focused on linguistic interfaces. The following sections briefly describe some relevant studies that have found divergence on interface-conditioned properties among child learners.

Child monolingual and bilingual acquisition studies demonstrating that syntax is rather straightforwardly acquired, but that convergence on properties requiring the incorporation of linguistic information and other cognitive domains is somewhat delayed, provide evidence suggesting that certain linguistic properties (i.e. those that require integration of more than one source of information) are delayed relative to others. If empirical investigation demonstrates that purely syntactic properties emerge in children before interface-conditioned properties, it would not be surprising to find a similar developmental sequence in adults, thus highlighting the importance of examining near-native speakers’ knowledge when testing for knowledge of properties that are more costly,\(^5\) such as those that lie at the interface. That is, as is emphasized by the most recent version of the IH (Sorace 2011), its claims are not intended to apply to adult second language speakers of lower proficiency levels since it cannot be determined whether relevant differences found are due to insufficient exposure to the language at the time of testing, some intermediary process of interlanguage development or inevitable variability in ultimate attainment (see for discussion White 1989, 2003a). Additionally, if the claim that processing consequences of bilingualism are the source of differences between monolinguals and bilinguals, both child and adult bilinguals are predicted to diverge on interface-conditioned properties.

The following section summarizes select child language acquisition studies that examine the distribution of null and overt subjects in Romance languages. First, two studies examining

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\(^5\) I am purposely hedging when referring to things as “more costly.” This label can include things that are truly more formally complex, which would need to be shown in linguistic computational terms and/or properties requiring more processing resources. It is often difficult to tease these two variables apart and not immediately clear what individual authors mean when they call something (formally) complex; complexity being a theory-internal notion and not an intuitive one. Suffice it to say that interface-conditioned properties require “more,” whatever this turns out to be, since integration of multiple types of information is at play (either across linguistic systems or between linguistic systems and external domains of cognition).
monolingual Spanish acquisition are described (Lapidus Shin 2006; Austin, Blume, Parkinson, Núñez del Prado & Lust 1997). Next, Bel (2003) and Grinstead (2004), which examined both monolingual Spanish- and Catalan-speaking children and showed similar trends in the Catalan data, are outline. Paradis and Navarro (2003) and Liceras, Fernández Fuertes and Alba de la Fuerte (2012) tested English-Spanish bilingual children, with mixed results reported as a product of English influence. Finally, Sorace, Serratrice, Filiaci and Baldo (2009) examined both English-Italian and Spanish-Italian bilingual children as compared to monolinguals. While all studies examined Romance languages, varied methodologies were employed across different language learners and age groups. Across those studies that examined subject distribution in light of discourse, however, the results indicate that accessing or integrating interface-conditioned knowledge is belabored for children. Additionally, several studies point to the need to carefully consider the input to which participants are exposed.

In a study on the distribution of overt and null subject pronouns in Mexican Spanish, Lapidus Shin and Cairns (2012) tested for sensitivity to Continuity of Reference (i.e. Topic Maintenance and Topic Shift) with third person singular subjects. Stories that contained either Topic Maintenance or Topic Shift were narrated to the 139 child participants and 30 adult control participants with a target sentence that contained either an overt or a null subject and the preferences of the participants were recorded. The results pointed to differences between the children and adults, especially the younger participants. Specifically, while adults preferred overt subject pronouns in Topic Shift contexts and null subject pronouns in Topic Maintenance contexts, younger participants overextended null subject pronouns to Topic Shift contexts. With respect to the Topic Maintenance tokens, only the oldest group showed adult-like preferences.

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6 This work has its base in Lapidus Shin (2006).
Lapidus Shin & Cairns also reported that the preference for overt subject pronouns over null subject pronouns in Topic Shift contexts becomes significant around 8-9 years of age.

Austin et al. (1998) also examined the distribution of overt and null subject pronouns in their study on the spontaneous speech of 10 monolingual Spanish-speaking children ages 1;2 to 3;4 years (Mean Length Utterance (MLU) of 1.29-4.77). Null subject pronouns appeared at the earliest MLU tested, while overt subject pronouns began to appear at MLU 2.0. In general, substantially fewer overt subject pronouns were evidenced across all MLUs and across all person/number combinations (approximately 18% of subject pronouns were overt with the highest percentages evidenced for first person singular). Similar to Lapidus Shin & Cairns (2012), Austin et al. found that syntactic licensing and identification of null subject pronouns precedes their adult-like distribution.

In addition to monolingual Spanish-speaking children, Bel (2003) also investigated monolingual Catalan-speaking children’s convergence on the distribution of overt and null subject pronouns. Specifically, longitudinal recorded oral data from three Spanish- and three Catalan-speaking children ages 1;7-2;8 years were examined. The earliest evidenced overt subject pronoun in both Spanish and Catalan appeared relatively early at ages 1;9 and 1;10, respectively. The percentage of overt as compared to null subject pronouns reaches what are considered adult-like levels when MLU reaches approximately 2. Bel interprets the findings as supporting the Continuity Hypothesis in that early convergence in the domain of syntax is found.

Similarly, Grinstead (2004) investigated the distribution of subject pronouns in four monolingual Catalan-speaking children and in three monolingual Spanish-speaking children.

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7 An overuse of overt subject pronouns was also reported in Bayley and Pease-Álvarez (1996); however, this study represents a language contact scenario where English may have influenced overt subject pronoun distribution.

8 Auxiliary verb omission is also examined, but will not be discussed herein as the main focus of this study involves subject distribution.
Grinstead found that, as compared to children acquiring a non-null-subject language, children acquiring a null subject language did not use overt subjects as early. Nonetheless and complimentary to the findings of Lapidus Shin & Cairns (2012), Austin et al (1998) and Bel (2003), overt subjects were evidenced in one Catalan- and two Spanish-speaking children as early as 1;10 and more consistently around 2;0 or later. In line with previous research claiming that subjects are in the Complimentizer Phrase (CP; Contreras 1991; Otero 1993; Dobrovie-Sorin 1994; Ordóñez 1997; Alexiadou & Anagnostopoulou 1998; Ordóñez & Treviño 1999; Holmberg 2005 among many others), Grinstead argued that subjects are in the left-periphery (which is deemed inactive in child production from the onset of language use) and that there is an interface delay between syntax and pragmatics (although the discourse-pragmatics module is argued to be present since children distinguish between new and old information). While some claim that grammatical delays and deficits result from children’s developmentally-delayed discourse-pragmatics competence, Grinstead argued that children do in fact have adult-like discourse pragmatic competence (as well as relatively adult-like syntax), but that they are unable to properly access it. In line with the IH, Grinstead claimed that the difference between adult and child production is a result of an immature interface between syntax and discourse-pragmatics.

Similarities between the Spanish monolingual data presented in Lapidus Shin and Cairns (2012) and Austin et al. (1998) and the Spanish and Catalan monolingual data presented by Bel (2003) and Grinstead (2004) include early emergence of overt subject pronouns, but protracted convergence on their discourse distribution. Having formulated a base of monolingual Romance data, the following studies examine bilingual convergence on similar properties.

Paradis and Navarro (2003) examined the spontaneous speech data of two Spanish monolingual children (ages 1;8–2;7 and 1;8–1;11 years), one Spanish–English bilingual child
(age 1;9–2;6 years) and their parental interlocutors in light of subject use. They predicted that a Spanish–English bilingual child may produce more overt subjects than a typically developing monolingual child speaker of Spanish and that the bilingual child may not exhibit the same two-stage developmental pattern as the monolingual. By looking at the proportion of overt subject use versus null subject use as well as the context in which they were used, Paradis and Navarro claimed that the bilingual child overused overt subjects (35% (31% were overt pronouns)) as compared to the monolingual children (at or below 20% (25% and 16% were overt pronouns)). While all three children used overt subjects according to the five discourse-pragmatic functions identified in the study, the bilingual child’s percentage of overt subjects was more than twice as high as that of the monolingual children (26% versus 10% and ~0%). Paradis and Navarro asserted that the bilingual child’s patterns showed evidence of English influence. However, they later noted that the Spanish to which the bilingual child was exposed is different from that of the monolingual children in that the bilingual child was exposed to Cuban Spanish, which is a variety that contains more overt subjects than null as compared to the Peninsular variety the monolingual children were exposed to: 60% overt, 40% null versus 40% overt, 60% null, respectively.

Liceras et al. (2012) compare data on two English-Spanish bilingual twins that was first presented in Liceras, Fernández Fuertes and Pérez Tattam (2008) with the bilingual data reported in Paradis and Navarro (2003). The spontaneous speech data presented ranges from age 2;04 years to 4;11 years and MLUs ranging from 1.43-4.28 and 1.48-3.88 for each twin. The twins, like the Spanish-speaking children discussed in Bel (2003), produce both overt and null subject pronouns in the earliest stage reported. The fact that no significant increase in production of overt subject pronouns is evidenced between the first two testing stages indicates that children
converge on the syntax of null subjects early on, as data from aforementioned studies has also suggested. Differently from Paradis and Navarro (2003), the bilingual twins did not demonstrate an overuse of overt subject pronouns. This finding points to input, rather than the influence of English, as the factor affecting the overproduction of overt subject pronouns by bilingual child studied in Paradis and Navarro (2003).

Lastly, Sorace et al. (2009) compared two child bilingual groups, English-Italian bilinguals and Spanish-Italian bilinguals, to child and adult monolingual speakers of English and Italian. Again, participants were tested for knowledge of subject distribution in Topic Shift and non-Topic Shift contexts in both English and Italian (in the case of the English-Italian bilinguals) and Italian (in the case of the Spanish-Italian bilinguals). The participants completed an Acceptability Judgment Task comprised of short videos in which two characters that “were learning” English or Italian summarized the events of the videos. The participants were asked to choose which of the two characters spoke “better.” The Italian results showed that both the monolingual and bilingual children in the younger age group (6-7 years), especially those living in an English-speaking environment, accepted significantly more overt subject pronouns in contexts that required null subjects as compared to the older bilingual children and the adult control. However, the older Spanish-Italian bilinguals (8-10 years) also accepted more overt subject pronouns than all the other child groups. These results suggest divergence regardless of the language pairing, which is predicted by the IH since processing limitations, and not language pairing, are the purported source of divergence. Finally, as Sorace et al. pointed out, this study highlights the importance of isolating and testing for the various discourse contexts (Topic Shift, Topic Maintenance, Focus, etc.), as not all contexts may be equally difficult.
Thus, results from the subject distribution child acquisition studies described above demonstrated early production of both overt and null subject pronouns, but that, in those studies that examined this distribution in light of context, children had difficulty integrating interface-conditioned knowledge, even when the related syntax was presumed to be in place. Hulk and Mülller (2000) also echoed these findings in that the Dutch-French and German-Italian bilingual children examined had difficulties with object-drop, which they claim is an external-interface conditioned property. Contrary to the predictions of the IH, L1 effects were also evidenced in some of the literature reviewed above, which shows that, in addition to interface difficulties, language pairing may have an effect on child language acquisition. This was also evidenced in Serratrice, Sorace & Paoli (2004) who examined the distribution of subjects and objects in an English-Italian bilingual child) and Serratrice et al. (2009). In the former study, the speech of an English-Italian bilingual child was found to be influenced unidirectionally (English to Italian) in that overt subjects were used in Italian where null subjects were preferred. In the latter, bilingual English-Italian children performed less accurately with respect to specific and generic plural noun phrases in Italian than did monolingual Italian-speaking children and adults or bilingual Spanish-Italian children. As described in Section 2.3.1, we might expect adult second language (L2) learners to demonstrate divergence on properties with which children also experience difficulties, like those described in above. This highlights the necessity of testing near-native learners as they can be assumed to have converged on the grammar. Section 2.3.2 describes some adult acquisition studies that found divergence on interface-conditioned properties related to subjects.

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9 Despite this divergence, the same child bilinguals did not show difficulties with respect to Root Infinitives, which are also argued by Hoekstra and Hyams (1998) to be an interface-conditioned property.
2.3.2 Divergence on Interface-conditioned Properties Related to Subjects: Adult Studies

The following sections describe recent empirical studies that examine the acquisition of interface-conditioned properties by adult bilinguals. These studies, which examine properties such as word order, the distribution of subjects and objects and topicalization, found divergence on interface-conditioned properties and are thus taken as providing evidence in support of the IH.

2.3.2.1 Word order and null subjects

The first set of studies reviewed dealt with word order as it relates to the subject and verb as well as the distribution of null and overt subject pronouns. Importantly, these properties are related to the NSP. While Belletti and Leonini (2004), Belletti, Bennati and Sorace (2007) and Tsimipli, Sorace, Heycock and Filiaci (2004) examined different language pairings in different bilingual instances (L2 acquisition in the first two studies and L1 attrition in the later), common across all three studies is the finding that interface-conditioned properties related to the NSP are vulnerable in these populations.

Specifically, Belletti and Leonini (2004) investigated Verb-Subject (VS) word order and null subject use in a group of adult second language speakers of Italian with different native languages (Albanian, French, German, Russian, Polish, etc.) of varying lengths of stay in Italy and various amounts of Italian study in their native country. Null subject languages, like Italian and Spanish, typically allow for VS word order more freely than non-null subject languages like English. Additionally, VS word order is often the result of focus (new information coming last in the sentence as compared to topic, or old information, being presented first). The second language learners of Italian were presented with a PowerPoint presentation in which they viewed 22 short videos. Participants were asked to answer two questions after viewing each video: one

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10 Predicate type also affects word order in Spanish (Contreras 1976; Suñer 1982; Ordóñez 1997; Zubizarreta 1998).
asked by a character in the video and one asked about the video. In their answer, participants were instructed to use the verb contained in the scene in the most natural way possible. Group 1 was composed of the most fluent speakers of Italian, and they performed the most native-like; however, Belletti and Leonini claim that this is a result of first language transfer. The native speakers of French or German performed least native-like (however, they seemed to have the lowest proficiency as well), again suggesting language transfer issues as neither French nor German is a null subject language. Regarding null subject use, the native speakers of French and German used fewer null subjects than the control group and the other second language learners of Italian. However, their performance regarding null subjects was more accurate than their use of VS word order, suggesting that purely syntactic properties are converged upon prior to interface-conditioned properties.

Similarly, Belletti et al. (2007) investigated the production and interpretation of postverbal subjects, overt pronominal subjects and null subjects in near-native speakers of Italian (native speakers of English). Participants completed three production tasks: a Verb-Subject Video Task to elicit narrow focus new information postverbal subjects, a Story Telling Task to examine spontaneous production of subjects, and a Headlines Task to examine the production of preverbal and postverbal subjects according to their definiteness in focus sentences. They also completed an interpretation task, which consisted of a Picture Verification Task to test for the interpretation of overt and null subject pronouns. While all properties examined are related to the null subject setting of the NSP in Italian (English is a non-null subject language), properties such as focus implicate the syntax-pragmatics interface. Regarding subject use, Belletti et al. found that the near-native speakers of Italian overused overt subjects in contexts where null subjects are felicitous to a significantly greater extent than monolingual controls. This finding is consistent
with the patterns of interpretation of subject pronouns in forward and backward anaphora contexts: overt subject pronouns were interpreted as co-referential with the matrix subject at a significantly higher rate by the near-native speakers than by the control group. Additionally, the near-native speakers underused postverbal subjects: Subject-Verb-Object was the most frequently produced word order. Since the near-native speakers used null subjects, but seemingly did not converge on the distribution of overt and null subject pronouns in Italian, it appears that the syntax-pragmatics interface was at fault, not syntax proper (i.e. the participants had successfully reset the NSP to the null subject setting in Italian). These findings led Belletti et al. to claim that interface-conditioned properties, such as the use of overt and postverbal subjects, are somewhat problematic for the near-native speakers due to simultaneous accessibility of more than one grammatical system (which makes more options available to second language speakers than the monolinguals have at their disposal).

Finally, Tsimpli et al. (2004) tested for attrition effects in native speakers of Greek or Italian who had lived in Britain for a minimum of 6 years and were near-native speakers (according to White and Genesee’s (1996) proficiency test) of English, yet continue to use their native language on a regular basis. Specifically, this study tested the production and interpretation of overt and null subjects and for preverbal and postverbal subjects. Participants completed one production task (Headlines Task) and one interpretation task (Picture Verification Task). The purpose of the Headlines Task was to examine the production of preverbal and postverbal subjects in all-focus contexts. Participants were asked to form a sentence consisting of a given verb, a noun phrase and an adverbial phrase that were presented to them randomly on a computer screen. The phrase had to begin with Did you hear that...? The phrases were presented along with a picture depicting the action to be described by the participant. The second task, the
Picture Verification Task, tested the participants’ interpretations of overt and null pronominal subjects. Participants were presented with a bi-clausal token sentence and three pictures and then asked to point to the picture that accurately described what was said in the token sentence. The second token type, which tested for knowledge of new versus old information, contained two token sentences with the second sentence including a singular indefinite subject in either preverbal or postverbal position. Following Sorace (2000), Tsimpli et al. predicted that “syntactic attrition primarily affects morphosyntactic features that are interpretable at the LF interface but leaves unaffected uninterpretable features, which regulate parametric syntax” (2004, p. 263). Results from the two tasks were interpreted as providing evidence for the claim that narrow syntax is unaffected, but interface properties are vulnerable to language attrition.

2.3.2.2 Word order

Next, word order is examined in L2 learners. The first study, Lozano (2006) shares some crossover with the studies reviewed in Section 2.3.2.1 since it examines distribution of SV/VS word order. However, Lozano (2006) leaves aside the topic of null subjects and instead focuses solely on word order. The second, Dominguez (2007), also investigates word order as a product of two focus types. Similarly, Hertel (2003) examines SV/VS word order as it relates to broad and narrow focus. The authors conclude that syntax may be in place before and is less subject to vulnerability than interface-conditioned properties.

Lozano's (2006) investigation tested advanced adult second language learners of Spanish (native speakers of either English or Greek) for the distribution of SV and VS word orders. These word order alternations are determined both by formal syntax and by pragmatics (presentational focus). Lozano predicted that in unfocused contexts (i.e. constrained by syntax only), the second language speakers would show native-like knowledge but that in focused contexts (i.e. constrained by pragmatics), they would “show divergent intuitions as these
properties can be persistently problematic” (p. 164). Participants completed a Contextualized Acceptability Judgment Task with paired target sentences and a 5-point Likert scale. The results of the experimental task demonstrated that the second language speakers converged on the syntax of Spanish word order for the properties tested, yet diverged (by showing optionality) with discursive focus. That is, the second language learners and native speakers alike significantly preferred SV to VS word order with unergative verbs, while they significantly preferred VS word order to SV with unaccusatives verbs. However, in presentational focus contexts, the second language learners accepted both SV and VS word order regardless of the verb type, showing optionality. Lozano thus concludes that syntax is in place before interface-conditioned knowledge.

Domínguez (2007) also tested L2 learners of Spanish (native speakers of English) for convergence on SV and VS word order, but in both information focus and contrastive focus contexts. Domínguez predicted that if learners were able to restructure from their native English grammar, which does not allow the SV/VS word order alternation, they would produce and accept SV and VS word order in the correct contexts. The participants, whose proficiency ranged from advanced to intermediate to low, completed two tasks. The first was a Contextualised Production Task in which participants orally responded to a question (context was provided) and the second, an Acceptability Judgement Task, in which participants rated both possible word orders on a -2 to +2 scale according to a context. The results of the production task showed that the SV word order was preferred by participants regardless of their proficiency level. Nonetheless, the advanced group employed a cleft construction to differentiate between contrastive and non-contrastive focus. Similarly, the SVO word order was preferred in the acceptability task, but the advanced group accurately accepted VSO word order, rejecting the
SVO word order in narrow focus contexts. As some participants produced and accepted VS word order, which is not transferable from their L1, the results of Domínguez (2007), like Lozano (2006), point to earlier convergence on syntax than on the discourse distribution of word order with a positive correlation between proficiency and convergence.

In a similar study, Hertel (2003) tested native speakers of English who were learning L2 Spanish for sensitivity to the SV/VS word order alternation as a function of discourse and also verb class as in Lozano (2006). Unlike accusative verbs, which appear postverbally in both broad and narrow focus contexts, unergative verbs are split, appearing preverbally in broad focus contexts and postverbally in narrow focus contexts (Contreras 1976; Suñer 1982; Ordóñez 1997; Zubizarreta 1998). Assuming that syntax is in place before related discourse knowledge, Hertel predicted that learners would show gradual knowledge of Spanish word order alternations, and that they would demonstrate sensitivity to the word order alternations as a product of verb type before focus. Participants of beginner, low intermediate, high intermediate and advanced proficiency completed a contextualized production task in which they were asked to respond in writing (which obscures potential intonational stress placed on subjects in English) to a broad or narrow focused question. As predicted, the results showed that the advanced learners demonstrated sensitivity to word order according to verb class. Additionally, the advanced and intermediate learners showed knowledge of the word order alternation in focus contexts. While not discussed by Hertel, the fact that the intermediate learners were shown to have converged upon the discourse use of the SV/VS word order alternation but did not display this same sensitivity in the syntactic condition, provides evidence against the prediction that sensitivity to syntax emerges before sensitivity to discourse.
2.3.2.3 Null subjects

The following two sections describe some empirical work investigating the distribution of overt and null referential subject pronouns as well as anaphora interpretation. Montrul and Rodríguez Louro (2006) and Sorace and Filiaci (2006) examined native English speakers’ ability to restructure from a non-null subject grammar to a null subject grammar (i.e. Spanish in the case of Montrul and Rodríguez Louro and Italian in Sorace and Filiaci (2006)). Across both studies, evidence suggesting that the participants demonstrated null subject grammars was found; however, divergence obtained with respect to interface-conditioned properties related to the distribution and interpretation of referential subject pronouns.

Montrul and Rodríguez Louro (2006) investigated knowledge of the morphosyntax and discourse-dependent distribution of subject pronouns in native English-speaking L2 learners of Spanish. Participants were divided into three proficiency groups (intermediate, advanced and near-native) based on a proficiency measure and an oral interview that was rated by two native-speaker judges. Participants also completed an Oral Elicitation Task based on the children’s story Little Red Riding Hood. While Montrul and Rodríguez Louro acknowledged the potential limitations of only using one production task, they justify its implementation since it allowed them to examine properties related to the syntax of null subjects (i.e. subject-verb agreement, referential and expletive subjects, preverbal and postverbal subjects, etc.). Data related to the discourse distribution of subject pronouns was coded according to topic maintenance (null subjects are licit), topic shift and focus (overt subjects are licit). Both the intermediate and advanced groups produced more illicit overt subjects than the near-native and native control groups (no significant difference was found here). Interestingly, the advanced and near-native groups produced more illicit null subjects as compared to the native control group (and interestingly, the intermediate group).
In a different language pairing (near-native adult Italian L2 learners, L1 English), Sorace and Filiaci (2006) investigated knowledge of overt and null subjects in. The near-native speakers began learning Italian after puberty and had lived in Italy for a minimum of 1.5 years. Additionally, their proficiency was assessed using an adapted version of White and Genesee’s proficiency test (1996). The near-native speakers, along with a native Italian control group, completed an off-line Picture Verification Interpretation Task designed to test the interpretation of null and overt subjects in the context of forward and backward anaphora resolution. Sorace and Filiaci predicted that the near-native group would differ only in their interpretation of overt pronouns (interpreting them as being co-referential with the matrix clause subject), but not null pronouns and that the near-native group would differ from the control group more on backward anaphora tokens. The results showed that the near-native speakers interpreted null subject pronouns in both forward and backward anaphora tokens as the native speakers did. However, the near-native speakers differed from the native speaker group regarding their interpretations of overt subject pronouns in both forward and backward anaphora tokens. Specifically, they interpreted the overt subject pronoun as co-referential with the matrix clause subject significantly more often than the native speaker group. Based on these findings, Sorace and Filiaci claimed that the near-native speakers demonstrate having acquired the syntax of subjects in Italian, yet still exhibit “residual indeterminacy in the interface processing strategies they employ in interpreting pronominal forms” (p. 339).

It is necessary to acknowledge three other studies that examined subject distribution, importantly in bilinguals of two null subject languages. Both Bini (1993) and Margaza and Bel (2006) examined native Spanish-speaking participants’ convergence on another null subject grammar (Italian and Greek, respectively). Bini examined spontaneous speech data from eleven
beginning proficiency and seven low-intermediate L1 Spanish-speaking learners of Italian. 

Margaza and Bel (2006) employed two experimental tasks in their study examining 10 intermediate proficiency and 9 advanced proficiency L1 Spanish-speaking learners of Greek. The first, was a cloze task and the second a written production task. The authors reported that both participant groups overused overt subject pronouns, despite the fact that their L1 would provide facilitative transfer. Similarly, García-Alcaraz and Bel (2011), examined 10 L1 Dariya-speaking learners of Spanish and 10 Dariya-Spanish bilinguals. Dariya, like Spanish, is a null subject language. The participants’ oral and written data were examined with respect to convergence on referential subject pronoun distribution. Two important findings obtained from this study. First, while null subject pronouns were found to accurately maintain a discourse referent, overt subject pronouns had a more varied function than that of the native speakers, which was to reintroduce a referent. This result differs from that of Lozano (2002) and Prada Pérez (2009), which are discussed below in Section 2.3.4.1. Second, evidence of L1 transfer was not found in the L2 learner group, whereas the bilingual group seemed to perform more native-like than the L2 group (although the authors claim that this knowledge cannot be said to be equivalent to that of the control group). While these studies provide results on unique language pairings and all report overuse of overt subjects, it is important to point out that the linguistic and educational system of Spain presents a potential caveat: the speakers of Bini (1993) and Margaza and Bel (2006) were more likely than not third language (L3) learners of Italian and Greek, not L2 learners. This is so because of the requirement to study an L2. Similarly, García-Alcaraz and Bel (2011) disclosed that, due to their geographic location, the participants of their study were also exposed to Catalan and are, thus, trilingual. As this dissertation focuses on L2 acquisition and bilingualism, these studies will not be reviewed at length.
2.3.2.4 Subject and object expression

The ensuing paragraphs review studies investigating subject and object expression, the availability of which is dependent upon narrow syntax while the distribution is dependent upon the syntactically and pragmatically defined contexts. While Montrul (2004) examined heritage speakers of Spanish and Tsimili and Sorace (2006) examined adult naturalistic learners of Greek, both examined the oral production and ultimately found divergence at the interfaces.

Montrul (2004) examined subject and object expression in 24 Mexican-American adult heritage speakers of Spanish living in the United States. Subject and object expression were examined since these properties are tied to narrow syntax (e.g. the mere availability of both overt and null subjects in Spanish; object clitics), but their distribution is dependent upon the syntax-semantics and the syntax-pragmatics interface. It was hypothesized that the participants would demonstrate knowledge of null subjects and object clitics in Spanish, but that they would demonstrate variability on interface-conditioned distribution of related properties. Participants completed an Oral Production Task in which they recounted the story *Little Red Riding Hood*. The results indicated that the narrow syntax had not been negatively affected by English since, for example, the heritage speakers used both overt and null subjects as well as preverbal and postverbal subjects. Evidence supporting the claim that heritage speaker’s language is affected at the interface, however, was provided in that the lowest proficiency group used more overt subjects than null subjects and that heritage speakers were not accurate in the use of redundant overt subjects and illicit null subjects. Divergence was found regarding the distribution of the differential object marker *a* and the inherent dative case possession structure; hence the data indicated that interfaces are vulnerable to linguistic influence or loss. Montrul claimed that the bilinguals resorted to the least costly semantic and pragmatic option offered by the two languages. She also claimed that the semantic and pragmatic features of Spanish were eroded.
and that the heritage speakers have a reduced grammar that converges on the morpho-syntactic characteristics of English.

Finally, Tsimpli and Sorace (2006) tested for knowledge of the syntax-semantics and the syntax-pragmatics interfaces of subjects and object focusing in adult native Russian speakers who were naturalistic learners of Greek. Participants completed a 10-20 minute long oral interview in which they described their background, told a story based on a set of eight pictures, completed two instruction-giving tasks and gave a general discussion of life topics. Tsimpli and Sorace differentiated between internal-interface conditioned properties and external-interface conditioned properties, predicting that the former would cause fewer problems at the advanced proficiency level than the latter, due to the interpretability of the features involved in the study. Divergence was predicted at the external interface due to the interference of discourse factors that regulate the distribution of overt and null pronouns in L1 Russian (which are different from those responsible for the distribution in Greek). Specifically, Tsimpli and Sorace predicted an overuse of overt subject pronouns. However, the authors found that all three proficiency groups overused null subject pronouns, a fact that cannot be attributed to first language transfer since Russian is a non-null-subject language. With respect to the internal interface, Tsimpli and Sorace found that all three participant groups were aware of and used obligatory verb-raising in focus contexts only (i.e. not in topicalization contexts, which is correct). Still, clitics were problematic for all groups. Tsimpli and Sorace conclude that no developmental pattern is seen with either interface-conditioned property and that external-interface conditioned properties are more problematic for second language learners.

2.3.3 Summary of Divergence Data

The child language acquisition studies (both monolingual and bilingual) described in Section 2.3.1 investigated the distribution and interpretation of overt and null subject pronouns
and in languages/language pairings involving Romance languages (Catalan and Spanish monolinguals, English-Spanish bilinguals, English-Italian bilinguals, Spanish-Italian bilinguals.). The general consensus of these studies is that interface-conditioned properties are more problematic than narrow syntax for child monolinguals and bilinguals alike, thus lending support, in the cases of child bilinguals, for the IH. However, language pairing effects were found in Serratrice et al. (2009) (and also in Serratrice et al. (2004), which examined an English-Italian child), suggesting that other factors may affect convergence.

The adult language acquisitions studies (covering adult second language learners, heritages speakers and first language attriters) described in Section 2.3.2 investigated such properties as SV/VS word order (English-Spanish and Greek-Spanish L2 learners; Italian-English and Greek-English attriters), distribution of referential subject pronouns (English-Italian and Russian-Greek L2 learners; L3 Spanish-Italian learners, L3 Spanish-Greek learners, L3 Dariya-Spanish learners; Italian-English and Greek-English attriters), and argument expression (Spanish-English heritage speakers). As with the child studies, the studies largely found evidence supporting the IH in that, generally speaking, properties involving only the narrow syntax were less problematic while interface-conditioned properties were more problematic. Differently from the child language acquisition studies, many adult acquisition studies reported an overuse of overt subject pronouns. Still, some evidence suggesting convergence on interface-conditioned properties was found. For example, Sorace and Filiaci (2006) found that the near-native speakers interpreted null subject pronouns in both forward and backward anaphora tokens as the native speakers did; likewise, Montrul and Rodríguez Louro (2006) found no significant differences between the near-native speakers and the native control group with respect to
pragmatically-conditioned distribution of overt and null subject pronouns in their Oral Elicitation Task.

Sections 2.3.1 and 2.3.2 described both child and adult second language acquisition studies whose results showed divergence on interface-conditioned properties related to subjects. Thus, these studies largely support the IH’s claims. The following section describes several adult second language studies showing contradictory evidence. That is, the following studies report convergence on interface-conditioned properties.

2.3.4 Convergence on Interface-conditioned Properties Related to Subjects

Just as evidence has been found suggesting that interface-conditioned properties are subject to inevitable divergence in bilingual grammars, much empirical research in the generative paradigm has also provided convincing evidence that adult bilinguals demonstrate native-like knowledge of interface-conditioned properties related to overt and null subject pronouns. The following sections describe some of this research.

2.3.4.1 Subject distribution

The subsequent sections summarize experimental investigations examining properties related to the NSP. Rothman (2008a) and (2009) both examined native English-speaking L2 learners of Spanish regarding their convergence on the syntax and interface-conditioned distribution of subject pronouns in Spanish and Gürel (2006) examined native English speakers’ convergence on similar properties in L2 Turkish. Lozano (2002) compared knowledge of two pronominal constraints related to subject distribution in both Greek- and English-speaking L2 learners of Spanish while, Prada Pérez (2009) examined subject expression in Spanish in contact with Catalan. According to the authors, the results indicated that convergence on interface-conditioned properties related to the distribution of subjects is possible in adult L2 acquisition. Still, a developmental pattern was seen in Rothman (2008a) and (2009) in that only the advanced
participants demonstrated convergence on interface-conditioned properties. These studies, along with Prada Pérez (2009) point to proficiency as a factor affecting convergence.

The first study, Rothman (2008a), examined an earlier version of the IH (Sorace 2006) in two experimental participant groups, intermediate and advanced second language learners of Spanish (native speakers of English). Specifically, knowledge of the distribution of overt and null subject pronouns in Spanish was tested. Participants completed a Pragmatic Felicitousness Judgment Task and a Pragmatic Context Sentence Translation Task. The tokens of the first task were presented via recordings of native speakers of Spanish (no visual presentation of the tokens was made available to the participants), thus judging their ability to respond to real-time speech. Upon listening to each token, the participants rated its felicitousness on a 5-point scale. In the second task, participants translated an English sentence to Spanish. The results showed a developmental path: while both the intermediate and advanced learner groups demonstrated convergence on the syntax of subjects in Spanish, only the advanced learner group demonstrated mastery of the pragmatic distribution of overt and null subjects. Since the more advanced second language learners demonstrated knowledge of the pragmatically conditioned distribution of overt and null subjects, Rothman claimed that the results provided evidence against the IH. It was argued that interface-conditioned properties, such as the distribution of overt and null subject pronouns in null subject languages, are inherently more complex; thus convergence on such properties is delayed, but not impossible.

Rothman (2009) also tested Sorace’s IH (2006) by examining the interpretation and distribution of overt and null subjects in intermediate and advanced second language learners of Spanish (native speakers of English). Participants completed a Co-reference Interpretation Task which tested for knowledge of the Overt Pronoun Constraint (OPC; Montalbetti 1984), a
Pragmatic Context-Matching Felicitousness Judgment Task which tested for knowledge of the pragmatically-conditioned distribution of overt and null subjects and a Pragmatic Context Translation Task which tested for production of overt and null subjects in specific contexts. On all tasks, the advanced participants performed in a native-like fashion (no significant differences were found). Regarding the intermediate group, 28 of the 38 participants showed sensitivity to the OPC, which Rothman takes as sufficient evidence of a null subject grammar. However, in the Pragmatic Context-Matching Felicitousness Judgment Task, the intermediate participants rated infelicitous overt subjects as felicitous as well as infelicitous null subjects as felicitous significantly more often than the native control group and the advanced group. Finally, on the Pragmatic Context Translation Task, the intermediate participants used more null pronominal subjects in contexts requiring overt subjects (i.e. Contrastive Focus and answers to topic-wh questions). They also used more overt pronominal subjects in contexts requiring null pronominal subjects (non-focus contexts and yes/no questions). The intermediate participants differed significantly from the advanced and control groups. Their use of overt versus null subjects was deemed to be insensitive to the discourse. Like Rothman (2008a), the results of the three tasks employed in Rothman (2009) indicated a developmental path and demonstrate that vulnerability at the interfaces is neither inevitable nor permanent. The advanced participant group and 28 of the 38 intermediate participants demonstrated syntactic knowledge of the null subject setting of Spanish. The advanced participant group also demonstrated knowledge of the pragmatically-conditioned distribution of overt and null pronominal subjects in Spanish, thus demonstrating convergence on interface-conditioned properties. As research on first language acquisition has shown (e.g. Carroll 1983; Brownell, Carroll, Rehak & Wingfield 1992; Austin, Blume, Parkinson, Núñez del Prado & Lust 1996 among others), Rothman concluded that the syntax of
subjects is acquired before pragmatics and that, while external interface-conditioned properties were perhaps more difficult, they were not subject to inevitable vulnerability.

Gürel (2006) investigated resetting of the NSP in adult second language learners of Turkish (native speakers of English that had lived in Turkey for a minimum of 10 years). Turkish is a null subject language, however the Gürel claims that the constraint on overt pronoun binding is not a result of the OPC (Montalbetti 1984, p. 279) as in Romance languages, but rather is a result of a “Principle B requirement that disallows pronouns to be bound in their governing domain.” Still, the pragmatic distribution of overt and null subject pronouns in Turkish is similar to that of Romance languages in that overt subjects are used to introduce new topics or a change in topic, contrastive focus and the “yes/no” contrast while null subject pronouns are used when there is no topic change or contrastive focus. Twenty-eight second language speakers of Turkish and a native control group completed four experimental tasks: a Picture Selection Task, a Written Interpretation Task, a Truth-Value Judgment Task and a Picture Identification-Listening Task. The results of the picture selection task, which tested for pragmatically-conditioned uses of overt and null subjects, suggested that the second language participants converged on the distribution of null and overt subjects. While the participants converged on the syntax and pragmatics of null and overt subjects, they failed to acquire the binding properties of the overt pronoun o, presumably due to native language transfer interference. Thus, evidence against the IH was found for a unique language pairing: English-Turkish.

Next, Lozano (2002) compared two advanced L2 groups learning Spanish for knowledge of the OPC and a related property, Contrastive Focus Constraint (CFC). Unlike the L1 English speakers, the L1 Greek speakers’ native language matches the target language with respect to the properties tested (although Spanish was truly the participants’ L3 as Lozano reports that this
group learned English prior to Spanish (2006, p. 59). Participants completed an Acceptability Judgement Test (AJT) in which they determined the acceptability of two target sentences, one containing an overt subject pronoun and one containing a null subject pronoun, in light of a context. The results from the AJT showed that both the L1 English and L1 Greek speakers differentially judged overt and null subject pronouns in light of OPC tokens to a statistically significant degree and matched the native speakers. The same distinction was made with the CFC tokens, but the L1 English group differed significantly from the native speakers with respect to the target sentences containing null subjects. Thus, these results show convergence on an internal-interface conditioned property (OPC) and an external-interface conditioned property (CFC) by the L1 Greek speakers, but only the former in the case of the L1 English speakers, indicating that language pairing may play a role in convergence.

Finally, Prada Pérez (2009) explores the oral production of 11 L1 Spanish and 12 L1 Catalan bilingual speakers of Catalan-Spanish in Minorca, Spain specifically with respect to subject distribution. Catalan and Spanish, like Greek and Spanish in Lozano (2002), are both null subject languages and are typologically very similar. Speech samples were also collected from 12 monolingual Spanish speakers and 12 Catalan-dominant bilinguals to provide a basis of comparison. The data obtain from oral interviews showed, first, that production of overt subject pronouns in monolingual Spanish does not differ significantly as compared to Catalan. Nor did the bilinguals’ production of overt subject pronouns in Spanish differ significantly from the monolingual Spanish speakers. Prada Pérez did find, however, that L1 Catalan-speaking bilinguals demonstrated overt subject production in rates more similar to Catalan-dominant bilinguals than the L1 Spanish-speaking bilinguals. Proficiency effects, like those found in Rothman (2008a, 2009), were also reported in that high proficiency bilinguals from both groups
produced overt subject pronouns in rates more similar to the native speakers than those with lower proficiency in the language tested.

Thus, this set of studies examining subject distribution in L2 learners and bilinguals for whom the language pairings was either facilitative or non-facilitative demonstrated that convergence on interface-conditioned properties is not impossible (albeit in offline methodologies). In some cases, a developmental path was noted since proficiency was shown to positively correlate with native-like knowledge. The following section reviews research conducted on a property related to subjects in language pairings not discussed yet herein.

2.3.4.2 Word order

Three recent experimental studies that assessed knowledge of word order alterations in adult L2 learners are discussed below. Bohnacker (2010) examined German-speaking learners’ convergence on the prefield in Swedish. Prada Pérez (2010) investigated word order as a function of focus and predicate type in native Catalan-speaking L2 learners of Spanish. Both used offline tasks. Differently, Hopp (2009) employed both offline and online tasks in his study of L2 acquisition of scrambling in German by native speakers of English, Dutch or Russian. While these studies differ with respect to the bilingual populations, the properties studied and the experimental tasks employed therein, they are similar in that the results of these studies provided evidence that interface-conditioned properties are not subject to inevitable divergence in adult L2 learners.

Bohnacker (2010) examined properties related to word order at the syntax-discourse interface in adult second language learners of Swedish (native speakers of German). Specifically, the prefield (what precedes the verb) was examined since it is taken to be the element that situates the utterance in the overall discourse. Participants were classified as (largely naturalistic) adult second language learners of Swedish (although all participants had 7-9 years of English
instruction and some also had knowledge of French or Latin). Bohnacker also placed the learners at the advanced proficiency level based on the fact that they had all passed a language proficiency test in order to enter Swedish university prior to the experimental tasks. The data used in the analysis consisted of naturalistic written and spoken data which were collected at 3 year intervals. The results showed that the second language learners initially demonstrated more German-style prefield patterns using fewer expletives and more rhematic (new) information in the preverbal position. However, at the second and third testing interval, the second language participants demonstrated development towards the target grammar in that a substantial increase in expletive subjects, clefts and thematic information (or old information) was witnessed in the prefield. Since the participants demonstrated syntactic knowledge of related properties (namely the verb second (V2) nature of Swedish), yet demonstrated early difficulties with the associated interface-conditioned properties, Bohnacker claimed that the results are in line with previous research showing convergence on syntax but divergence on interface properties. Still, Bohnacker interpreted the overall findings as suggesting that, while interface-conditioned properties such as word order may be more difficult, convergence is possible as proficiency increases.

Building on work on English-Spanish bilinguals (e.g. Hertel 2003; Zapata, Sánchez & Toribio 2005; Lozano 2006; Domínguez & Arche 2008), Prada Pérez (2010) examined the effect that broad and narrow focus and verb type (unergatives and unaccusatives) have on word order in Spanish and Catalan. Word order as a function of focus, which is an external interface-conditioned property, behaves similarly in both Catalan and Spanish. However, as a function of verb type, which is an internal interface-conditioned property, differences obtain between the two languages. Specifically, preverbal subjects are preferred significantly more than postverbal subjects with unergative verbs in broad focus contexts in Catalan, yet this preference does not
obtain in Spanish. With respect to the IH, an interesting prediction falls out of these facts. Since the IH predicts vulnerability at external interfaces, differences are predicted with respect to word order as a function of focus but not verb type even though Spanish and Catalan behave similarly with focus, but differ with respect to verb type which is an internal-interface conditioned property. Eighteen monolingual Spanish speakers and 22 Catalan-Spanish bilinguals (16 L1 Catalan, 6 L1 Spanish) completed an Oral Contextualized Preference Task\(^{11}\). The results of this task showed that the bilingual participants demonstrated more vulnerability with subject-verb word order as a function of verb type as compared to focus. This finding provides evidence against the IH in that the bilinguals were found to converge on the external-interface conditioned property tested by Prada Pérez, but showed more differences with respect to the internal-interface conditioned property. Prada Pérez suggested that previous findings (e.g. Tsimpli & Sorace 2006) may be a product of language pairing, and not necessarily vulnerability at the external interface.

Hopp (2009) explored convergence on word order alternations as a function of the syntax-discourse interface in adult L2 learners of German. Specifically, the study examined convergence on scrambling in German by advanced to near-native proficiency level native speakers of English, Dutch or Russian. The language pairings were chosen in order to tease apart native language transfer effects from interface vulnerability effects. Participants completed an offline Acceptability Judgment Task (AJT) and an online Self-Paced Reading Task (SPRT). The first task tested for knowledge of the syntax of scrambling in German and its interaction with the syntax-discourse interface; the second task assessed online processing of scrambling. Regarding

\(^{11}\) Prada Pérez (2010) also reports on data from a Sociolinguistic Interview completed by Spanish monolinguals, Spanish dominant Spanish-Catalan bilinguals, Catalan dominant Catalan-Spanish bilinguals and Catalan monolinguals. While Catalan significantly prefers preverbal subjects, the Spanish preference did not reach significance.
the online task, Hopp was particularly interested in determining whether or not the second language learners demonstrated slower reading times on infelicitous tokens as compared to felicitous tokens (which, according to Hopp, would indicate that the learners simultaneously map discourse information onto syntax as they build phrase structure in real-time comprehension). For the AJT, Hopp found that the Russian-German learners (regardless of proficiency) made native-like distinctions regarding the syntax of scrambling in German. Additionally, the Russian-German learners were sensitive to the discourse-conditioned context with which the tokens were presented, indicating knowledge of the interface-conditioned use of word order in German. The advanced proficiency native speakers of English and Dutch, on the other hand, demonstrated divergence on the syntax of scrambling as well as the discourse-conditioned use of scrambling. Both the near-native proficiency speakers of English and Dutch demonstrated knowledge of the syntax of scrambling in German, but only the native English speakers were sensitive to the discourse-conditioned contexts. Regarding the SPRT, both proficiency levels of native speakers of English and Russian demonstrated significantly different reading times for the word order alternation according to the discourse-conditioned context than the native control group did. Neither proficiency level of native Dutch speakers showed this contrast. Hopp concluded that the overall findings indicated that properties requiring the integration of syntactic and discourse information do not represent an insurmountable difficulty for adult second language learners. This was true for offline comprehension as well as online processing.

Thus, the common finding obtained from the three studies described above that examined word order alternations is that external-interface conditioned properties were not shown to be points of inevitable divergence in adult L2 speakers. In Hopp (2009), this was shown in both offline and online tasks, and important methodological point for the claims of the IH.
Additionally, as the subject distribution studies above showed, Bohnacker’s study showed that interface-conditioned properties may be more difficult (i.e. converged upon at higher proficiency levels).

### 2.3.5 Summary of Convergence Data

The adult language acquisitions studies described in Section 2.3.4 examined such properties as overt and null subject distribution (English-Spanish, English-Turkish and Greek-Spanish L2 learners; Spanish-Catalan bilinguals), and word order alternations (German-Swedish and English, Catalan-Spanish bilinguals, Dutch or Russian-German second language learners). The results of these studies demonstrate that while not all L2 learners, specifically those at lower proficiency levels, converge on properties at the external interface, these properties do not represent an inevitable source of divergence. That is, the studies outlined above highlight advanced and near-native speakers’ ability to perform as native speakers do on properties that are perhaps more formally complex and require integration of syntactic and pragmatic/discourse information. Similar results were found in other IH studies investigating convergence on dislocations and modality alternations. Specifically, Donaldson (2011a, 2011b) examined English-speaking near-native L2 learners of French for knowledge of left- and right-dislocation and found that these learners converged upon the interface-conditioned properties examined. Ivanov (2009), which examined English-speaking intermediate and advanced L2 learners of Bulgarian, found that these learners converged on CLLD, an external-interface conditioned property. The English-speaking L2 learners of Spanish in Slabakova et al. (2012) were tested for knowledge of CLLD and Fronted Focus. Like the previous studies, the authors reported evidence demonstrating convergence on the external-interface conditioned properties tested therein. Likewise, in their examination of mood alternations in English-speaking L2 learners of Spanish, Iverson et al. (2008) found that, while the syntax-discourse interface was more difficult, the data
demonstrated that L2 learners could acquire the distinction between the subjunctive and indicative mood with negated epistemics in advanced stages of acquisition. Taken together, these studies provide evidence against the IH (Sorace 2011) in that they demonstrate convergence on external interface-conditioned properties.

2.3.6 Criticisms of Previous Behavioral Research

The empirical studies examined in Sections 2.3.1 and 2.3.2 provided evidence for the IH in that data were found suggesting that external interface-conditioned properties are subject to divergence in child and adult second language acquirers. However, Section 2.3.4 points to the opposite conclusion in that the empirical studies examined therein show convergence on external interface-conditioned properties. Still, both bodies of results indicate that related syntactic properties are not the source of any delays or divergence on external interface-conditioned properties. This finding is in line with the claims of the most recent version of the IH (Sorace 2011) since it claims that convergence on syntax is possible. Equally, these empirical studies seem to indicate that as proficiency increases, learners improve (if not converge) on external interface-conditioned properties.

Without a doubt, the empirical studies outlined in Section 2.3 have made significant contributions to the field of child and adult language acquisition. While not all studies explicitly test the predictions of the IH, their results can be, and have been, analyzed in light of the IH, especially the earlier versions. To recap, the most recent instantiation of the IH differs from earlier versions in that it claims that divergence on external interface-conditioned properties is due to the presence of two linguistic systems, which consequently results in limitations in attentional resources related to inhibitory control (Green 1986, 1998). That is, since bilinguals must divide cognitive resources to inhibit the non-relevant language, working memory, executive function and attentional resource allocation are burdened, causing processing difficulties where
syntactic information must integrate with pragmatic/discourse information. Sorace (2011) has also made explicit that the claims made by the IH are valid for near-native speakers only. With these claims in mind, some shortcomings of the research described in Section 2.3, in terms of their applicability to the current version of the IH, are described. Specifically, three shortcomings will be pointed out: lack of (standardized) proficiency tests to ensure near-native proficiency level in some of the studies, relative lack of variety of language pairings and use of largely offline experimental tasks which cannot measure the processing ability of participants.

Regarding the proficiency level of participants that took part in the studies described in Section 2.3, only the adult studies will be considered since the participants of the child monolingual and bilingual studies described in Section 2.3.1 should not be expected to have adult-like proficiency yet. Thus, of the adult studies that found divergence at the external interface described in Section 2.3.2, some (Belletti & Leonini 2004; Tsimpli & Sorace 2006) either did not employ a proficiency test or do not report on it. Of the studies that employed a proficiency test, it is not clear that all the participants of these studies have truly obtained near-native proficiency level. For example, Belletti et al. (2007), Sorace and Filiaci (2006) and Tsimpli et al. (2004) employed White and Genesee’s proficiency measure12. This proficiency measure consists of “an extensive face-to-face interview” (Belletti et al. 2007, p. 663) that is later evaluated by two native speaker judges. The native speaker evaluation, which is based on an 18-point scale, is meant to focus on “pronunciation, morphology, syntax, choice of vocabulary and overall impression of near-nativeness” (Belletti et al. 2007, p. 663). All participants except for one were judged in the near-native range by both native speaker judges in the Belletti et al. (2007) study. However, the participants of Sorace and Filiaci (2006) and Tsimpli et al. (2004)

12 In the case of Belletti et al. (2007) and Sorace and Filiaci (2006), the measure was adapted for Italian.
were not held to the same standard. That is, a lower cutoff point for near-native proficiency was employed for both studies. Sorace and Filiaci justify this decision by claiming that “unlike White and Genesee, we did not collect the data in a bilingual country and it is therefore more difficult to find speakers that satisfy the strictest criteria for L2 near-nativeness” (2006, p. 351). Tsimpli et al. (2004) offer a similar argument, claiming that near-native proficiency level participants are harder to find in monolingual countries. Differently from these studies, Prada Pérez (2009, 2010) employed a self-rating proficiency measure on a scale of 1–7. As might be expected from childhood bilinguals, the participants self-rated highly. Additionally, the type of proficiency measure employed in these studies, oral elicitation, must be carefully considered. Standard expectations of the field call for three components deemed to be key to language proficiency measures—validity, reliability and efficiency (see Bachman & Palmer 1996; Alderson 2000; Bachman 2004; Weir 2005; Hulstijn 2010). A test is deemed valid if it measures what it seeks to measure, reliable if it is consistent and precise and, lastly, efficient if the time invested in creation, implementation, coding and analysis of the test is less than the benefit gained from its employment. Since White and Genesee’s measure depends on the judgments of native speakers, which can be impressionistic and vary from one rater to the next (although inter-rater reliability tests can minimize this effect), it is reasonable to question the reliability of an oral elicitation measure, especially when the experiment examines syntax and discourse-dependent properties. Additionally, while this measure results in ample oral data in a conversation setting, due to the time required to analyze oral data, this measure is far more time-consuming than other measures, and, thus, potentially less efficient than other measures.

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13 However, see Flege and colleagues’ work which has shown that this type of task may be an accurate measure for phonological proficiency.
Lozano (2006) and Montrul (2004) both employed proficiency measures. Lozano’s participants were classified as advanced and therefore we cannot determine if they meet the requirement of being near-native speakers. Finally, the participants of Montrul (2004) are heritage speakers. Sorace (2011) specifically states that the claims and predictions of the IH have been overextended to heritage speakers since the type of speaker most typically examined are second-generation heritage speakers exposed to qualitatively and quantitatively different linguistic input (but see Montrul & Polinsky 2011 for a response to this claim). Thus, non-convergence on interface-conditioned properties, as compared to monolinguals, it is difficult to tease apart the effects of input differences and vulnerability at the interfaces. Montrul acknowledges this saying “Admittedly, it is not clear whether these speakers acquired the family language incompletely in the first place or lost aspects of it early in childhood” (2004 p. 126).

The present study addresses this shortcoming by employing a proficiency measure that is rather extensively used in generative research (e.g. Montrul 2000, 2002, 2005, 2009; White, Valenzuela, Kozlowska-MacGregor, & Leung 2004; Cuza & Frank 2011; Leeser, Brandl, & Weissglass 2011; Prada Pérez & Pascual y Cabo 2011, 2012; Pascual y Cabo, Lingwall, & Rothman 2012; Slabakova et al.2012). Employing standardized proficiency measures, which can only be labeled as such when the same measurement are employed using the same scoring criterion, is important for the field of acquisition research, but especially when testing a hypothesis such as the IH. This is so because a cross-study comparison of convergence on interface-conditioned properties is not fruitful if variables like proficiency are not controlled for.

The second shortcoming of the studies described in Section 2.3.2 and Section 2.3.4 is the relative lack of variety regarding language pairings. Of the 21 adult acquisition studies described in these two sections, 71% (15/21) include a Germanic language (Dutch, English, German or Swedish) as
either the first or second language, and of these 134 studies, 93% (14/15) include English. Another 71% (15/21) include a Romance language (Italian or Spanish) as either a first or second language. Only 42% (9/21) include a non-Germanic, non-Romance language (e.g. Greek, Russian or Turkish). While all of these studies are informative and relevant to the field of adult second language acquisition, as has been pointed out by Rothman and Slabakova (2011), a variety of language pairings must be tested in order for the results to be generalizable. If not, the results (whether demonstrating divergence or convergence) could simply be a product of the particular language pairing as pointed out by Prada Pérez (2010). Thus, researchers must test the predictions of the IH not only on the language pairings on which the claims were based and that differ with respect to the property tested, but also on language combinations in which the property is similar (as in Bini 1993; Lozano 2002; Belletti & Leonini 2004; Margaza & Bel 2006; Hopp 2009; Prada Pérez 2010; García-Alcaraz & Bel 2011) to disentangle the effect of L1 transfer. This dissertation addresses this issue in that it studies a language pairing that shares the same parameter value for the property tested (i.e. null subject languages). Differently from the studies listed above which have also examined this type of language pairing, the present study is unique in that, while Farsi and Spanish are both syntactic-discourse configurational null subject languages that license pro and also share analogous discourse distribution of subject pronouns for the contexts tested herein, the underlying syntax of the two languages differs according to Karimi (2005). Additionally, Farsi-Spanish is a completely novel language pairing.

The final shortcoming of the adult acquisition studies described in Section 2.3 is the near across-the-board implementation of offline\(^\text{14}\) behavioral methodology, either in the form of offline judgment, interpretation or production tasks, the only exception being Hopp (2009).

\(^{14}\) Offline tasks, as opposed to online tasks, are untimed (i.e. they do not gather reaction time data).
While the field of generative second language acquisition has traditionally employed offline behavioral tasks of the pen-and-paper or picture-matching sort when examining adult comprehension, these are not necessarily appropriate tasks for all current research questions. Collaborative work between psycholinguistics and generative linguistics has highlighted the superior elucidatory value of online tasks (such as self-paced reading or eye-tracking tasks among others) for current generative research questions, especially those examining language processing. As described in Marinis (2010), a distinguishing characteristic of offline behavioral and online tasks is that the former do not control for, nor do they measure, the time each participant requires to read a sentence, respond to or complete a certain task. Marinis claims that offline comprehension tasks can only measure a participant’s interpretation of a token sentence after they have listened to the entire token, which he claims taxes working memory in that three steps are required in order to complete the task. First, the participant must process the token in real time as it is presented to them. Second, the token must be maintained in working memory. Finally, the participant completes the item by answering a yes/no question, matching the target sentence with a picture, or whatever the task requires of the participant in order to measure their answer. A natural consequence of this type of task is that participants with higher working memory will likely perform better, although this result may not be indicative of their underlying linguistic competence, but rather of their higher working memory capacity. A further disadvantage to offline tasks is that participants are normally not limited by time constraints, which allows for the possibility of employing domain-general skills and metalinguistic awareness, a problem that can lead to inaccurate conclusions about the representation of language in the participant. Finally, behavioral offline tasks do not allow the researcher to examine the temporal processing of language, which means that it is not possible to determine
when and/or where ungrammaticality or infelicity is detected. Thus, the questions that can be answered with offline behavioral tasks are limited.

Many online tasks, in contrast, remedy these shortcomings by measuring participants’ unconscious and automatic responses to linguistic stimuli while the stimuli are presented to the participant. Since data is obtained during stimuli presentation, it is less affected by the strain on working memory described by Marinis above. Even so, no task is entirely free of weaknesses. Marinis acknowledges that online measures require considerable preparation because every aspect of the tokens (length of sentence, frequency of vocabulary, etc.) must be controlled for. Additionally, more tokens are required than for offline tasks, which increase the length of the study and, consequently, the burden on the participant. Data analysis is often more complex since two variables may require analysis—the participant’s response (e.g. yes/no) as well as the reaction time (RT). Nonetheless, as the IH claims that the locus of vulnerability in near-native second language speakers is an artifact of the increased processing burden experienced by bilinguals, online tasks are in the best position to test the claims and the predictions of the hypothesis. In the case that differences are found between monolingual and bilingual speakers, offline tasks are not able to distinguish between the potential sources of these differences (i.e. whether the differences obtain as a result of deficiencies in competence or in processing\textsuperscript{15}). Thus, while the studies described in Sections 2.3.1 and 2.3.2 found some level of divergence, these studies are not in a position to provide evidence for or against the IH (Sorace 2011)\textsuperscript{16} as it specifically claims that processing differences obtain as a result of the presence of two linguistic systems, which leads to limitations in attentional resource allocation (Green 1986, 1998). Section

\textsuperscript{15} Of course, this does not necessarily mean that the opposite is true, especially depending upon one’s theoretical assumptions. For example, demonstration of similar processing may not mean that the representation is the same.

\textsuperscript{16} Of course, the same could be said for the studies that found convergence on interface-conditioned properties examined in Section 2.3.4 since they also employed offline behavior tasks.
2.4 provides information regarding language processing, the parsing model adopted herein, as well as various experimental methodologies used to test participants’ processing. Finally, some previous studies, as well as their limitations, are outlined.

2.4 Language Processing

Section 2.3 above described recent behavioral research examining convergence on interface-conditioned properties while Section 2.3.6 described some shortcomings of these studies as related to the IH. The goal of the current section is to give a succinct overview of language processing including the parsing model adopted herein (Section 2.4.1) and a brief summary of various types of methodologies employed in processing studies (Section 2.4.2) and some relevant findings of recent processing research (Section 2.4.3). While much research has been conducted on the processing of garden path sentences and interpretive preferences (e.g. high or low attachment of relative clauses), the studies presented herein are limited to those that are most relevant for this study’s focus, namely those that examine the processing of grammatical versus ungrammatical stimuli. Finally, Section 2.5.4 describes some limitations of this body of research.

2.4.1 Parsing Model

As stated by Felser (2005, p. 95), a principal goal of research conducted on second language processing is to describe “the architectures, mechanisms and representations that underlie L2 processing,” often in light of native versus non-native speaker comparisons. Phillips (1996) presents two parsing models that differ in their treatment of the parser and the grammar. The first model, which he labels the PIG model (Parser is Grammar), does not distinguish between the parser and the grammar, whereas the second model does. While Phillips ultimately

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17 Sentence processing as it relates to production will not be considered herein as it is not the focus of this dissertation.
argues for the *PIG Model*, many psycholinguistic models assume a distinction between the grammar and the parser, perhaps as a function of their distinct roles in language comprehension (i.e. the grammar being the competence system and the parser being the performance system). Returning to the IH, it is claimed that the simultaneous activation of the relevant grammar and the inhibition of the irrelevant grammar in adult bilinguals taxes cognitive resources. Thus, working memory and executive function systems (i.e. cognitive resources and, importantly, not the grammar or the parser) are taken as the loci of divergence. It is not clear to me whether any theoretical implications pertinent to the present study fall out of the fusion or separation of the grammar and parser. Therefore, because Phillips’ second model aligns well with my conceptualization of language in that it separates performance (the parser) and competence (the grammar) and because the model is not problematic for the questions examined herein, I assume that the parser and grammar are separate. The assumption of this model is supported by recent work by Hopp (2007), who, in an exhaustive study covering seven experiments, examined questions similar to those presented herein. Specifically, knowledge and processing of interface-conditioned properties related to scrambling in near-native L2 German speakers (the L1s were English, Dutch or Russian) was studied.

Under this view, language comprehension is dependent on the grammar, the parser and a finite set of cognitive resources including executive function, working memory and inhibitory control (Phillips 1996)\(^{18}\). As depicted in Figure 2-3 below, the grammar includes linguistic knowledge while the parser is composed of both universal and language-specific parsing

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\(^{18}\) Phillip’s original model includes “world knowledge” and “past experiences” under Cognitive Resources; yet, as the relevancy of these items regarding the questions examined in this study is unclear, they have been replaced with two very relevant items taken to be outside the grammar and the parser: inhibitory control and executive function.
mechanisms and resolution strategies. The former is associated with the competence system, the latter with the performance system.

![Diagram](image)

Language comprehension = 

**Grammar**
- Lexicon
- Language universals
- Language-particular properties
- Economy considerations

**Parser**
- Structure-building procedures
  - universal
  - language-specific
- Ambiguity resolution strategies

**Cognitive Resources**
- Executive function
- Working Memory
- Inhibitory control

Figure 2-3. Grammar-parsing model adapted from Phillips (1996, p. 16)

The available cognitive resources delimit language processing. Each of these three components of language processing is a potential source of divergence in adult language acquisition. As described in Section 2.2, the IH does not assume that the underlying representation of language (the grammar) is divergent, nor does it make specific claims about particular processing strategies. Instead, the IH claims that performance and interpretive differences between monolinguals and bilinguals may derive as a result of the division of finite cognitive resources in the latter instance only. That is, as previously described, due to competition between multiple grammars in a single mind, attentional resource allocation related to inhibitory control (Green 1986, 1998) is taxed in bilinguals, creating an extra burden for the working memory and executive function systems. With this model of language comprehension in mind, the following section reviews several methodological paradigms employed in the examination of language processing.
2.4.2 Language Processing Methodology

Neurophysiological and behavioral tasks alike have been employed in psycholinguistic studies examining language processing, both contributing different pieces of the puzzle. On the one hand, neurophysiological tasks such as Position Emission Tomography (PET) and Functional Magnetic Resonance Imaging (fMRI) provide information regarding the areas of the brain that are activated during language processing. However, since these methods rely on changes in hemodynamic states, neither provides reliable information regarding the fine-grained time-sequencing of language processing. Event-related potentials (ERPs) and behavioral methodologies such as eye-tracking, cross-modal priming, self-paced reading and speeded grammaticality judgment tasks, on the other hand, provide more precise information regarding real-time language processing. It should be noted, though, that the granularity of precision among these methodologies varies, with ERPs and eye-tracking as providing perhaps the highest level of online resolution. The following section describes previous research that employs both neurophysiological and behavioral tasks.

2.4.3 Previous Research

While some previous research investigating second language processing has found differences between the regions of the brain that are recruited in language processing and/or the timing of language processing, it is not clear whether these differences are a result of processing differences only, or if other factors are involved. Contributing variables, such as proficiency or amount of exposure, may have an effect on second language processing, yet these variables are not always controlled for. Of course, these contributing variables may be intertwined with processing and they can be difficult to define. Referencing the parsing model illustrated in Figure 2-3 and for the purposes of the present study, proficiency is taken to be a product of the grammar and the parser, as well as being influenced by Cognitive Functions. The same difficulty in
defining proficiency is encountered with respect to amount of exposure as simple questions regarding daily exposure or length of residence in an L2 environment may obscure reality. Below, I briefly review some second language processing research conducted in the neurophysiological paradigm (Section 2.4.3.1) and behavioral paradigm (2.4.3.2). Section 2.4.4 discusses some limitations of this general body of research.

**2.4.3.1 Neurophysiological studies**

Abutalebi, Cappa and Perani (2001) review several early functional neuroimaging studies examining bilingual production and comprehension. For this paradigm and those that follow, I will focus on comprehension data only since the experimental methodology employed in the present study does not include production data. Perani et al. (1996) conducted a PET study in which a homogeneous group of nine male late bilinguals of low L2 proficiency listened to stories in their native language (Italian), their second language (English) and in a third language of which they had no knowledge (Japanese). Abutalebi, Cappa and Perani found more extensive activations for native language processing as compared to second language processing and also report that the activation pattern for the second and third unknown language is the same (see Table 1 and Figure 1, Perani et al., 1996, p. 2440-2441). A similar methodology was employed by Dehaene et al. (1997). Instead of PET scanning, fMRI was used to determine the brain activation patterns of a homogenous group of eight male bilinguals of moderate proficiency in second language English while listening to stories in their native language (French) or their

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19 None of the participants were exposed to English, the second language, before age 7, and all 9 participants had studied English for a minimum of 5 years. A word translation and a sentence comprehension measure tested for their proficiency. All had “a good understanding of spoken English” (Perani et al. 1996, p. 2439), but this is taken as low proficiency (see Abutalebi, Cappa & Perani 2001, p. 185).

20 None of the bilinguals had been exposed to English before age 7, and based on their completion of the same word translation and sentence comprehension measure employed in Perani et al. (1996), these bilinguals were deemed to have moderate proficiency in English.
second language. In line with previous research, Abutalebi, Cappa and Perani found a correlation between native language processing and activation in the left temporal lobe. However, when the participants listened to the second language, “a highly variable network of left and right temporal and frontal areas, sometimes restricted only to right-hemispheric regions” was activated (Dehaene et al., 1997, p. 3809).

Kotz (2009) provides an updated review of fMRI and ERP experiments examining L2 processing, many of which examine highly proficient bilinguals. Two ERP studies and an fMRI studies indicating differences in native and non-native processing are described. First, Hahne (2001) examined syntactic and semantic processing via ERPs. A second language group of 16 native speakers of Russian that had learned German after the age of 10\textsuperscript{21} years was compared to a group of 16 native speakers of German. Stimuli included grammatical tokens, tokens with semantic violations, tokens with syntactic violations and fillers (see Table 1, Hahne 2001, p. 254). Kotz reports that both the native and second language German groups demonstrated an N400 effect for the semantic violation tokens, which is expected as N400 effects are associated with integration of semantic information. However, there were differences between the two groups in that the N400 effect of the second language group was less pronounced in terms of amplitude and showed a longer peak latency than that of the native speakers (550 versus 750ms, respectively). Regarding the syntactic violation tokens, the native speaker group demonstrated sensitivity to syntactic violations in that, as compared to the grammatical sentences, an early anterior negativity (ELAN) was elicited by ungrammatical sentences. This too is expected as ELAN effects (often with latencies between 100-300ms) are associated with word category or phrase structure violations. This was followed by a centro-parietal positivity (i.e. a P600 effect)

\textsuperscript{21} The background of the bilingual participants is quite variable and the averages presented are misleading if the range is considered. For example, the average time learning in a formal setting was 6 years, but the range was 2-168 months. Additionally, all but one participant had knowledge of English, which could be another confounding factor.
that peaked around 800ms\textsuperscript{22}. P600 effects are also associated with syntactic processing and may be elicited by ungrammatical sentences, garden path sentences and complex sentences. The L2 group, however, did not demonstrate differences for the grammatical and ungrammatical tokens as measured by early anterior negativity. Still, like the native speakers, the syntactic violation tokens elicited a positivity, albeit with a later peak latency (approximately 950ms). This seems to point to timing differences between the two groups.

Hahne, Mueller and Clahsen (2006) examined the processing of irregular and regular participial inflection and two types of plural marking on nouns via ERPs. A bilingual group comprised of 18 native speakers of Russian\textsuperscript{23} who were late second language learners of German participated in the study. The average age of first exposure was 17 years, although there is considerable variability (8-29 years\textsuperscript{24}). A self-rating task served as a proficiency measure; the average self-rating was 5 out of 6 (=high proficiency). In the participle task, a total of 50 regular and 50 irregular participles were embedded in simple declarative sentences composed of six words each. The tokens were presented word by word on a computer screen with the participle in sentence-final position. In the noun task, a total of 480 tokens were presented to the participants. Half of the nouns were marked with the correct plural marking and half were marked with the incorrect plural marking. The nouns were embedded in sentences and always appeared in direct object position followed by an adverbial or a prepositional phrase. Regarding participle inflection, the ERP data show a regular/irregular distinction. Regularizations (i.e. the regular –t suffixed to an irregular verb) elicited an anterior negativity between 250 and 600ms as well as a small parietal positivity between 600 and 1000ms compared with their correct counterparts in the

\textsuperscript{22} Although usually occurring approximately 600ms after the presentation of the stimuli, Kaan and Swab (2003) claims the effect may appear as early as 400ms, while Friederici (2002) claims it may appear between 600-1000ms.

\textsuperscript{23} The Russian participle and noun-marking systems are substantially different than that of German.

\textsuperscript{24} A wide range of length of residence in Germany (.5-12 years) is possibly a confounding factor.
L2 participants. By contrast, irregularizations (i.e. irregular -n suffixed to a regular verb) yielded a centrally distributed negativity between 450 and 600ms relative to the correct participle forms. With respect to plural marking, regularizations (i.e. regular –s incorrectly suffixed to a noun taking –n) elicited a P600. Irregularizations (i.e. irregular –n incorrectly suffixed to a noun taking –s) elicited an N400. Differently from native German speakers, no anterior negativity was found with the L2 participants for overuse of the –s plural. This last finding suggests that overuse of the –s plural was not detected as a word category or phrase structure violation in the L2 participant group as it was in the native German speaker group.

Rüschmeyer, Fiebach, Kempe and Friederici (2005) used fMRI to explore syntactic and semantic processing in native speakers of both German (n=18) and Russian (n=7) and native speakers of Russian that are advanced learners of German (n=14). The second language learners of German are described by Rüschmeyer et al. as “highly proficient, late learners of German” (Rüschmeyer et al. 2005, p. 280) that “had been living in Germany in for an average of 5 years” (271)

25 No standardized proficiency measure is mentioned nor is the range of for age of onset of acquisition or length of residency provided. Thus, the groups may contain considerable variability with respect to these variables.
obtained in Rüschemeyer, Zysset and Friederici (2006), which also examined native Russian speaking late learners of German.

While different and similar patterns between native and non-native processing were discussed in Abutalebi et al. (2001) and Kotz (2009), both reviews highlight the role of proficiency and its positive correlation with similar activation patterns. In fact, when the methodology from Perani et al. (1996) was employed with highly proficient Italian-English bilinguals, Perani et al. (1998) found similar activation patterns between native and second language processing. This finding was interpreted as indicating that proficiency is a determining factor (see also Weber-Fox & Neville 1996; Perani et al. 2003; Wartenburger et al. 2003; Dodel, Golestani, Pallier, ElKouby, Bihan & Poline 2005; Rüschemeyer et al. 2005; Rüschemeyer et al. 2006 for age and proficiency effects). Finally, the three studies presented above are just a few of many neurophysiological studies and therefore should not be taken as representative of the larger body of research. However, across both Abutalebi et al. (2001) and Kotz (2009), the lack of standardized proficiency measures and agreement concerning the definition of early versus late bilingual is obvious. These issues should be kept in mind to rectify in future studies.

Despite the studies suggesting differences in non-native language processing, the overall conclusion of Kotz (2009) is that the body of neural data indicates that the areas of the brain activated in second language processing are similar to those activated in native language processing. Results across different language pairings, modality of stimuli presentation, linguistic domain of investigation and early versus late bilinguals offer support that this claim is not simply restricted to certain language pairings or linguistic domains. For example, Perani et al. (1998) and Luke, Liu, Wai, Wan and Tan (2002) found similar native and non-native neural

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26 In the case of the Italian-English late bilinguals, proficiency was assessed via the same word translation and sentence comprehension task used in Perani et al. (1996).
activation during sentence comprehension (involving syntax and semantics) whether presented aurally or visually. These results further contribute to the overall picture in that the language pairings examined therein are different: Perani et al. (1998) examine bilinguals of typologically similar languages (Italian-English), while Luke et al. (2002) examines typologically dissimilar languages (Chinese-English). Several ERP studies showed that even with little exposure, non-native lexical-semantic processing demonstrated native-like N400 effects (e.g. McLaughlin, Osterhout & Kim 2004; Osterhout, McLaughlin, Pitkänen, Frencck-Mestre & Molinaro 2006). Winkler et al. (1999) demonstrated that native Hungarian speakers who were second language learners of Finnish evinced native-like Mismatch Negativity (MMN)\(^\text{27}\) for a phonemic contrast in Finnish. Frenck-Mestre, Osterhout, McLaughlin and Foucart (2008) and Frenck-Mestre, Foucart, Carrasco and Herschensohn (2009) demonstrated that phonologically realized morphosyntactic errors elicited a P600 effect in French. For morphosyntactic properties related to subject-verb agreement, number agreement and gender agreement violations Bond, Gabriele, Fiorentino and Alemán Bañón (2011) found a P600 effect (for similar results in different language combinations see also Sabourin 2003; Rossi, Gugler, Friederici & Hahne 2006 for subject-verb agreement; Tokowicz & MacWhinney 2005; Gillon Dowens, Vergara, Barber & Carreiras 2010 for gender agreement). Finally, Hernandez, Hofmann and Kotz (2006) found a basic overlap for native (early Spanish-English bilinguals) and non-native (native English, late Spanish learners) gender processing. Still, retrieval differences between the early and late groups were found\(^\text{28}\). In general, then, the neural studies and results reviewed by Kotz (2009), across various language pairings, testing modality and linguistic domain, points to the conclusion that similar brain areas are

\(^{27}\) Mismatch Negativities (MMNs) are generally elicited by unexpected stimuli in a series of visual or aural stimuli.

\(^{28}\) This difference could be a product of the exposure to and use of Spanish—early bilinguals might have a higher necessity for use of Spanish (i.e. family members) than late learners.
activated in first and second language processing. The following section describes some studies from the behavioral paradigm.

2.4.3.2 Behavioral studies

As discussed by Foucart and Frenck-Mestre (2012), an advantage of the eye-tracking paradigm (as opposed to the visual presentation of stimuli in ERP studies or non-cumulative self-paced reading studies) is that the complete sentence can be presented to participants allowing them to read at their own pace and also to reread regions. I will only briefly describe the findings of two recent eye-tracking studies examining grammatical violations. These studies provide evidence that late second language processing can be similar to that of native language processing. Finally, two studies using the self-paced reading paradigm will be described. While eye-tracking and self-paced reading studies are highlighted here, behavioral tasks examining processing are not limited to these two paradigms. Nevertheless, only these will be described in this section as they are “the most widely-accepted experimental tasks for the investigation of sentence comprehension during reading” (Witzel, Witzel & Forster 2012, p. 106).

Keating (2009) examines second language processing of gender agreement between nouns and adjectives in Spanish. Specifically, Keating is interested in determining whether processing effects are found as a function of syntactic distance between the noun and adjective. Three groups of native English-speaking, late learners of Spanish (beginner, intermediate and advanced) as well as a native Spanish-speaking control group completed a sentence

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29 However, one disadvantage of the eye-tracking paradigm is that it does not provide information regarding the nature of the processing (i.e. whether syntactic or semantic processing is implicated).

30 Proficiency levels were based on years of exposure to Spanish as well as university course placement.

31 While the native Spanish speakers were reported to have resided in and (minimally) completed their high school education in a Spanish-speaking country, these participants were tested in the United States and were described as “graduate students, teaching assistants, and lecturers at the university” (Keating 2009, p. 511). Thus, it is likely that they are somewhat proficient in English.
comprehension task while eye-tracking data were recorded. Participants were presented with 48 fillers and 36 experimental stimuli evenly divided by grammaticality, gender and condition (agreement within the Determiner Phrase (DP), the Verbal Phrase (VP) or Complementizer Phrase (CP)). While the beginner and intermediate groups did not demonstrate evidence of having acquired grammatical gender in Spanish, the advanced group did. That is, the advanced group, like the native Spanish-speaking group, showed sensitivity to ungrammatical gender agreement between nouns and adjectives within the DP, via longer reading times as compared to the grammatical DP condition. However, this finding was absent for the VP and CP condition. These results demonstrate that late second language acquirers are able to converge on properties not present in their native language, for example, grammatical gender and adjectival word order. It should also be pointed out that native-like sensitivity to gender agreement in the VP and CP conditions might be evinced in near-native speakers or with participants living in a Spanish-speaking environment as recency and higher daily use of the target language may affect convergence.

Foucart and Frenck-Mestre (2012) conducted a series of ERP and eye-tracking experiments within the same group of native French speakers and native English-speaking late learners of French. While the ERP experiments elicited P600 effects for gender agreement violations with postnominal adjectives both in native and second language speakers, an N400 (rather than a P600 effect) effect was found for gender agreement violations with prenominal adjectives for second language speakers only. Finally, while no effect was found for predicative adjectives in the third ERP experiment for the late learners of French, similar patterns

32 The second language learners’ average age of onset of acquisition was 13.4 years (range 10-18 years) while the average length of formal learning was eight years (range 5-11 years). Each had passed the DELF (Diplôme d’Etudes de Langue Française) and five participants had low to intermediate knowledge of another language.

33 A P600 effect was evinced for the native speakers.
were found for the same stimuli under the eye-tracking paradigm. Specifically, longer reading times were recorded for gender violations between nouns and predicative adjectives for both participant groups. Importantly, longer reading times were recorded for first pass, gaze duration and total reading time in both groups. Foucart and Frenck-Mestre note that the second language speakers’ eye-tracking patterns with non-local gender agreement were virtually indistinguishable from those of the native speakers (contra Keating 2009).

In a recent self-paced reading study, Sagarra and Herschensohn (2011) investigate sensitivity to grammatical gender in English-speaking late acquirers of Spanish as a second language. In addition to several offline measures, beginning (n=69) and intermediate learners of Spanish (n=64) and native Spanish speakers (n=63) completed a self-paced moving window task with comprehension questions in E-Prime software. Experimental tokens included grammatical gender and number agreement, gender agreement violation and adjective and number agreement violation between the noun and adjective. While both the beginner and intermediate second language groups were slower readers for the critical regions analyzed statistically, the intermediate group showed sensitivity to gender and number agreement violations. That is, the gender and number agreement violation conditions elicited slower reading times as compared to grammatical condition; this sensitivity is qualitatively similar to that of the native Spanish speakers. Sagarra and Herschensohn interpret this finding as evidence suggesting that native speakers of languages that do not have grammatical gender, such as English, may converge on grammatical representations that are similar to those of native speakers. This is especially revealing given the relatively low proficiency level and lack of naturalistic learning (no more than 3 months in a Spanish-speaking country).

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34 Proficiency was based on both class enrollment as well as a grammar section from the DELE.
VanPatten, Keating and Leeser (2012) also examined sensitivity to grammatical structures in non-advanced late second language learners of Spanish (native English speakers). Specifically, the reading times of second language learners (n=25) were compared to those of native Spanish speakers (n=18) for subject-verb inversion in questions, adverb placement and verbal inflection. Participants completed a self-paced reading task (using the non-cumulative moving window setup and with follow-up comprehension questions) in SuperLab. With respect to verbal inflection, VanPatten et al. report that only the native speakers demonstrated sensitivity to person-number agreement violations via slower reading times as compared to the grammatical items\(^35\). However, regarding both subject-verb inversion and adverb placement, sensitivity to violations was found in both participant groups via slower reading times for ungrammatical tokens as compared to grammatical tokens. Although VanPatten et al. ultimately argue that the aforementioned results suggest a representational problem for verbal morphology for the non-native Spanish speakers, one must take into account the proficiency level of the participants. It is possible that higher proficiency second language learners tested with the same methodology would demonstrate sensitivity to verbal morphology. Importantly, even non-advanced learners showed native-like sensitivity to two structural violations.

In summary, across both eye-tracking and self-paced reading paradigms, evidence supporting native-like processing in late second language learners—at least for Romance languages—has been provided. While the four studies described above examined grammatical gender, VanPatten et al. (2012) also provides evidence that late second language learners show sensitivity to structural violations related to word order. Since the properties investigated in these

\(^35\) When the 1\(^{st}\) person singular was compared against 3\(^{rd}\) person singular, “a trend toward grammatical sensitivity” was found (VanPatten et al. 2012, p. 132). For no other comparisons (i.e. 2\(^{nd}\) person singular versus 3\(^{rd}\) person plural) or individual subjects (1\(^{st}\) person singular, 2\(^{nd}\) person singular, etc.) was sensitivity to subject-verb agreement violations found.
studies are not instantiated in the native language of the second language participants (English), the results provide two important pieces of evidence. First, late second language learners are able to converge upon the underlying representation of properties absent in their native language and, second, that their processing of these properties can also be native-like.

2.4.4 Limitations of Previous Processing Literature

Although a complete review of the second language processing literature falls outside the scope of this study, the studies described in Section 2.4.3 provide significant conclusions. It was shown across various processing paradigms, languages and linguistic properties that second language learners can demonstrate native-like processing. Even so, a variety of results have been reported (see Abutalebi et al. 2001; Kotz 2009; Foucart & Frenck-Mestre 2012) and limitations of this literature have been made apparent. Hopp (2007) points out several characteristics of previous processing research that are limiting. First, previous research has demonstrated that there exists a positive correlation between higher proficiency and native-like processing; however, many of the studies examine second language processing with participants of lower proficiency and standardized proficiency measures are largely absent. Therefore, it is impossible to determine if the variable affecting divergence is related to differences in underlying grammatical representation or language processing itself, both of which are assumed herein to contribute to proficiency. Second, differences in exposure and use of the target language (which, similar to proficiency, likely affects automaticity in processing and distribution of cognitive resources) and working memory capacity are not always controlled for, thus introducing other contributing variables. Third, systematic attention has not been given to cross-linguistic differences as a potentially confounding factor. Finally, Hopp points out that second language processing research often relies on comparisons across studies with different participant populations and different experimental methods. While this is expected and encouraged within
the field, a more complete picture of second language processing could be obtained by examining a variety of linguistic properties within the same participant group (or, at least a maximally comparable one).

2.5 Testing the Interface Hypothesis

Based on the limitations pointed out in Sections 2.3.6 and 2.4.4, this section briefly describes the type of research that is needed in order to more adequately test the most recent version of the IH. First, since Sorace’s claims are relevant for near-native speakers only, standardized proficiency measures should be administered. Additionally, it is important to ensure that the second language learners, like monolinguals, have high levels of exposure to and use of the second language as this can affect automaticity. Second, since Sorace claims that the presence of two linguistic systems creates a burden on the processing abilities of bilinguals, online testing measures must be employed. These tasks provide the type of data necessary (RT, for example) to determine if there are differences between monolingual and bilingual processing. A related matter concerns working memory and inhibitory control capacity. As lower levels of working memory or inhibitory control may affect language processing, determining a baseline for participants is essential. Finally, to determine if Sorace’s claims apply universally to languages (i.e. are not specific to a particular language pairing or directionality), a variety of languages from various language families must be tested. As Hopp (2007) points out, comprehensive methodologies employed within the same or highly comparable populations will reduce extraneous factors, allowing for greater precision of interpretation of the results within in the scope of the particular study and decreasing the need for comparisons across different methodologies, participants and paradigms.

Accordingly, the aim of the dissertation study described herein is to advance previous research by examining an interface-conditioned property, referential subject pronoun
distribution, in a novel language pairing, Farsi-Spanish, using online tasks that are able to tap into the participants’ processing as well as offline tasks tapping into their competence. As in Prada Pérez (2010), this scenario is ideal for testing the IH’s predictions in that Spanish and Farsi are both null subject languages that apparently share an analogous distribution of referential subject pronouns, as in Bini (1993), Margaza and Bel (2006) and García-Alcaraz and Bel (2011). Nevertheless, the underlying syntax of the two languages is different and, according to Karimi (2005), Farsi does not possess the null expletive subject as Spanish does. In examining this property, it is possible to test the IH’s claim that data that the source of vulnerability is based in the presence of two grammars and not a result of the specific language pairing and/or directionality. The following chapter outlines the syntactic analysis of preverbal subjects in Spanish and Farsi.
CHAPTER 3
SYNTAX OF NULL SUBJECTS

3.1 Syntax

This chapter outlines the syntactic analysis adopted for the linguistic property tested in this dissertation study. Specifically, the syntactic literature of preverbal subjects is presented for both Spanish and Farsi. Furthermore, related interface-conditioned properties regarding the discourse distribution of referential subject pronouns is also examined.

3.2 Null Subject Parameter (NSP)

The well-formedness principle pertinent to referential subject pronouns is the Avoid Pronoun Principle (APP; Chomsky 1981)\(^1\) which simply states that overt pronouns should only be employed when absolutely necessary (i.e. for interpretive or discourse/pragmatic reasons). Thus, if an overt subject pronoun is not absolutely necessary, it should be avoided in favor of a null subject pronoun\(^2\). This is illustrated in example (1) below in Spanish, which is stated in discourse-neutral context (i.e. no contrastivity is meant to be conveyed):

\[(1)a. \#Marcos_{i} \text{ dice que } \dot{\text{él}}_{i} \text{ está ocupado.}
\]
\[\text{Marcos say-3.SG.PRES that he be-3.SG.PRES busy-MASC.SG}
\]
\[b. \text{Marcos}_{j} \text{ dice que } \text{pro}_{j} \text{ está ocupado.}
\]
\[\text{Marcos say-3.SG.PRES that be-3.SG.PRES busy-MASC.SG}
\]

“Mark says that he is busy.”

Example (1a) violates the APP in that it is not necessary to use the subject pronoun \(\dot{\text{él}}\) “he” in the embedded clause when \(\dot{\text{él}}\) “he” refers to the matrix clause subject \(\text{Marcos}\); therefore, the utterance is infelicitous\(^3\) with coreferentiality between the matrix and embedded clause

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\(^1\) How this principle of economy is conceived of in more modern terms is of no consequence. I use the Avoid Pronoun Principle as shorthand following others (e.g. Rothman 2009).

\(^2\) For representational sake, \(\text{pro}\) is used to indicate null subject pronouns. \(\text{pro}\) is a pronoun without phonological form that exists only in the underlying representation.

\(^3\) Infelicitousness is indicated by a pound sign (\#) while ungrammaticality is indicated by an asterisk (*).
subjects. In comparison, example (1b) is felicitous in that it obeys the APP: there is no
unnecessary use of an overt subject pronoun in the embedded clause. Since nominal phi-features
in Spanish license and identify null subject pronouns, the discourse neutral environment of
example (1) renders (1b) the only felicitous option.\(^4\) Notice, however, that the English glosses for
both Spanish examples above use the overt pronoun “he.” In fact, this is obligatory, as example
(2b) shows:

(2)a. Mark says that he is busy.
   b. *Mark says that pro is busy.

Based on examples (1) and (2), one might ask why English seemingly disobeys the APP
if it is a universal principle of well-formedness that applies to all natural languages. The overt
pronoun “he” is used in example (2a) when there is no switch in reference, and, thus, no apparent
reason for its use. The answer to this question is related to language specific parametric settings
and how they delimit what is possible in that language. Thus, as it relates to the APP, only
Spanish syntax licenses and identifies null subjects, a necessary precursor to see some of the
refluxes of null subjects predicted by the APP. English syntax, on the other hand, does not. So,
while all languages are governed by the same grammatical principles that delimit the options
available to human languages, crosslinguistic variation is a product of the particular setting of
parameters related to how these principles are manifested in language production.

Under Minimalist assumptions, parametric differences lie in the functional lexicon of
individual grammars. In other words, lexical items encode formal features of language from
which functional categories emerge as needed to value these features. The extent to which these

\(^4\) While examples (1a) and (1b) are both grammatical, they have different interpretive biases. According to
Carminati’s (2002) Position of Antecedent Hypothesis (PAH), the preferred interpretation of example (1a) is
overwhelmingly disjoint whereas that of (1b) is co-referential with the matrix clause subject. In the latter case,
coreference obtains precisely because pro strongly biases for coreference with the subject in Spec,TP of the matrix
clause. Since this is outside the scope of this dissertation, it will not be revisited.
features are different between languages gives rise to what is perceived as crosslinguistic differences.

The NSP has traditionally been conceived of as having two settings: non-null subject and null subject (see Perlmutter 1971; Rizzi 1982). Non-null subject languages (e.g. English, French and German) require overt subjects whereas null subject languages (e.g. Farsi, Greek and Spanish) allow for both null and overt subjects. Rizzi (1982) claims that the availability of null subjects is predicated upon the fulfillment of two requirements: (i) pro must be syntactically licensed and (ii) pro must be identified. While Farsi and Spanish are both null subject languages (i.e. they both meet Rizzi’s requirements), there are important differences between them. A difference related to word order is that in Farsi, as opposed to Spanish, all phrasal elements may remain in the vP (verb shell). Only for interpretive reasons (Topic, Focus, etc.) do elements leave the vP (Karimi 2005). The second difference is related to satisfaction of the Extended Projection Principle (EPP), a principle of grammar that requires all clauses to have a subject. Chomsky (1995) proposes that, in general, the EPP is a D(eterminer) feature of T(ense) that must be checked by an element in Spec,T (Specifier position of Tense Phrase). Goodall (2001, 2002) argues that this is how the EPP is satisfied in Spanish. However, Karimi (2005) contends that the

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5 While this binary distinction describes the languages under consideration in this study, researchers have further distinguished between types of null subject languages listing as many as four (Biberauer, Holmberg, Roberts & Sheehan, 2010, p. 6-13):

(i) Consistent null-subject languages (Greek, Italian, Spanish, etc.)
(ii) Expletive null subject languages (German, Haitian, Jamaican, etc.)
(iii) Discourse pro-drop/Radical pro-drop languages (Chinese, Japanese, Korean, etc.)
(iv) Partial null-subject languages (Brazilian Portuguese, Finnish, Hebrew, etc.)

6 Cases of dropped subjects in “diary-drop” or coordinated clauses are attested to in non-null subject languages such as English, for example (see Haegemann 1997); however, this does not mean that English is a null-subject language as pro cannot be licensed or identified in English.

7 In Rizzi’s terminology, identification occurs morphologically or syntactically. As first observed by Huang (1984), many East Asian languages may identify null subjects via the discourse; it was also claimed that overt subject pronouns and pro are in free variation in some South Asian languages.
same does not hold for Farsi. She explores three possibilities for EPP satisfaction (seen in the list below), ultimately concluding that it is satisfied morphologically and without movement in Farsi:

- XP movement (or Merge) to Spec,TP (English)
- V(er)l-to-Tense movement (most null subject languages; Alexiadou & Anagnostopoulou 1998)
- Morphologically (without overt movement; Farsi, Hungarian)

The first option described above is ruled out since the subject may remain in the vP in Farsi (unless topicalized or focused). Evidence for the vP internal status of the subject is found in adverbial placement. Based on the division of adverbs proposed by Cinque (1999), two groups are pertinent to Persian: the so-called “higher” adverbs and “lower” adverbs. The higher adverbs, which correspond to the sentence level, precede the lower adverbs, which correspond to the VP level. Karimi (2005) claims that both higher and lower adverbs adjoin to vP8; thus, given the position of the adverbs with respect to the rest of the sentential elements, the following examples provide evidence that Farsi subjects do not raise to Spec,TP to check the EPP, and instead may remain in the vP.

(3) diruz Kimea bâ Rahjue da’vâ kard
    yesterday Kimea with Rahjue fight did-3.SG
    “Kimea fought with Ruhjue yesterday.”

(4) ma’mulan Kimea tu ketâbxune dars mi-xun-e
    usually Kimea in library lesson DUR-read-3.SG
    “Kimea usually studies in the library.”

(5) kâmelan Kimea be hush umade

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8 According to Karimi (2005, p. 124-125), some higher adverbs in Farsi are amdan “intentionally”, xoshbaxtâne “fortunately”, zâheran “apparently”, badbaxtâne “unfortunately”, ma’mulan “usually”, ehtemalan “possibly”, modal adverbials such as shâyad “may be” and bâyad “must” and temporal adverbs such as emruz “today” and diruz “yesterday.” Lower adverbs include zirakâne “cleverly”, hamishe “always”, âghelâne “wisely”, hanuz “still/yet”, hargez “never”, kâmelan “completely”, nâgahân “suddenly” and taghriban “almost”, among others. Three higher adverb (Hadv) positions, are proposed (all preceding the lower adverb (Ladv) position):

(i) [ CP (Hadv) [ TopP (Hadv) [ TP (Hadv) (Ladv) [ vP ]]]]
completely Kimea to sense come-3.SG
“Kimea has completely regained her senses.”

(6) xoshbakhtâne kâmelan Kimea be hush umade (Karimi 2005, p. 94)
fortunately completely Kimea to sense come-3.SG
“Fortunately, Kimea has completely regained her senses.”

Although Karimi proposes three positions (see Footnote 8 above) for higher adverbs such as “yesterday”, “usually” and “fortunately” in the examples above, the fact that the subject of (5) and (6), “Kimea”, follows the lower adverb kâmelan “completely” demonstrates that it has not raised out of the vP since lower adverbs adjoin to the vP.9

The same examples in Spanish (with adjustments for word order) show a different picture. With neutral intonation and no pause after the adverb, these examples are ungrammatical since the subject must raise out of the vP. Thus not all phrasal elements may remain in the vP.

(7) (*ayer) Carmen se peleó con Ruben (ayer)
yesterday Carmen RFLX fight-3.SG.PRET with Ruben yesterday
“Carmen fought with Ruben yesterday.”

(8) (*usualmente) Carmen (usualmente) estudia en la biblioteca
usually Carmen usually study-3.SG.PRES in the library
“Carmen usually studies in the library.”

(9) (*completamente) Carmen entró en razón (completamente)
completely Carmen enter-3.SG.PRET in reason completely
“Carmen has completely come to her senses.”

9 The following examples show that the subject may be realized in a position higher than the adverb if topicalized or focalized (A. Feizmohammadpour, personal communication, March 30, 2013).

(i) Kimea diruz bâ Rahjue da’vâ kard
Kimea yesterday with Rahjue fight did-3.SG
“Kimea fought with Ruhjue yesterday.”
(ii) Kimea ma’mulan tu ketâbxune dars mi-xun-e
Kimea usually in library lesson DUR-read-3.SG
“Kimea usually studies in the library.”
(iii) Kimea kâmelan be hush umade
Kimea completely to sense come-3.SG
“Kimea has completely regained her senses.”
(iv) Kimea xoshbakhtâne kâmelan be hush umade
Kimea fortunately completely to sense come-3.SG
“Fortunately, Kimea has completely regained her senses.”
Fortunately, Carmen has completely come to her senses.

The second option is also discarded due to the fact that Farsi is a verb-final language and that Tense is phrase-initial in this language. As follows, if the verb raised to Tense, the canonical S(subject)-O(bject)-V(erb) word order of Farsi could not be maintained. In a neutral context, VSO is ungrammatical as the V does not raise out of the vP unless for emphasis.\(^{11}\)

Conversely, if Tense were in final position and the EPP were satisfied by overt Verb-to-Tense movement, the sentential argument of V would have to appear preverbally, contrary to fact:

```
(13)a. Kimea goft ke Parviz hune nist
    Kimea said-3.SG.PRET that Parviz home not-be.3.SG.PRES
b. *Kimea ke Parviz hune nist goft
    Kimea that Parviz home not-be.3.SG.PRES said-3.SG.PRET
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In Spanish, the most natural version of example (10) above would be:

```
(i)afortunadamente, Carmen entró en razón completamente
   fortunately Carmen enter-3.SG.PRET in reason completely
   “Fortunately, Carmen has completely come to her senses.”
```

While example (12) above is ungrammatical, the presence of the accusative specificity marker –râ (labeled below as DOM) makes the sentence grammatical. This follows from the structure described by Karimi (2005, p. 7). Both specific and non-specific direct objects are base-generated as the complement of V; however, like non-specific subjects, non-specific objects also remain inside PredP (Predicate Phase). Only specific subjects and specific objects (i.e. those marked with –râ) raise to Spec,vP. Thus, the sentence-final position of the specific direct object nân- râ demonstrates that both the specific subject Ramin and the verb khord have raised out of the vP for emphasis.

```
(i) khord Ramin nân- râ
    eat-3.SG.PRET Ramin bread-DOM
    “Ramin ate the bread.”
```
Considering the canonical SOV word order of Farsi, a preverbal sentential argument is actually expected. However, the fact that SOV word order becomes ungrammatical, as in (13b) above, provides evidence that V does not raise to a sentence-final Tense. Spanish also exhibits the same ban on preverbal sentential arguments as seen in example (14b) below. Differently from Farsi, Tense is sentence-initial in Spanish. Thus, when V raises to Tense in Spanish, the canonical SVO word order of Spanish is maintained.

(14)a. Carmen dijo que Paula no está en la casa.
   Carmen said-3.SG.PRET that Paula no be.3.SG.PRES in the house
b. *Carmen que Paula no está en la casa dijo.
   Carmen that Paula no be.3.SG.PRES in the house said-3.SG.PRET
   “Carmen said that Paula is not in the house.”

Essentially, Karimi’s analysis parameterizes the EPP dividing languages according to the way in which the EPP is satisfied: either by XP-movement to Spec,TP (as in (14) above) or via a property of the verbal morphology (as in (13) above). Karimi concludes that the EPP is satisfied morphologically in Farsi and that it is not a D (nominal) feature of T(ense) that triggers V-to-T movement as is in Spanish. Rather, Karimi deems it to be a property of the verbal morphology (overt agreement). Nominative Case is checked and valued morphologically in Spec,vP in Farsi while it is checked and valued in Spec,TP in Spanish. In both languages, the referent of pro is identified via the verbal agreement morphology due to the fact that it is unique for each person. See Table 3-1 below for the verbal agreement morphology for the present tense in Farsi and Spanish. An additional difference between Spanish and Farsi, although both null subject languages, regards expletive subjects. This is further discussed in Section 3.2.1.

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12 But, see Alexiadou and Anagnostopoulou (1998) for a different analysis of the parameterization of the EPP.

13 Or V to T to C or even V to C depending on the analysis taken (e.g., whether or not one assumes a Spec,TP projection in Spanish). Since this is inconsequential to the discussion at hand, I note in passing this active debate (see for example Suñer 1994; Ordóñez & Treviño 1999; Goodall 2001).
Table 3.1. Present tense verbal morphology

<table>
<thead>
<tr>
<th></th>
<th>Farsi</th>
<th>Spanish (–ar verbs(^{14, 15}))</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Singular</td>
<td>Plural</td>
</tr>
<tr>
<td>1(^{st}) person</td>
<td>–am</td>
<td>–im</td>
</tr>
<tr>
<td>2(^{nd}) person</td>
<td>–i</td>
<td>–id</td>
</tr>
<tr>
<td>3(^{rd}) person</td>
<td>–ad/ast</td>
<td>–and</td>
</tr>
</tbody>
</table>

3.2.1 Syntactic Properties Related to the NSP

In addition to the availability of null subject pronouns, Rizzi (1982, 1986), among others, has argued that certain syntactic properties, hypothesized to be directly associated with the null subject setting of the NSP, cluster together. However, which properties actually cluster with the NSP is a controversial topic (Jaeggli & Hyams 1988; Rothman & Iverson 2007; Rothman 2009). In the original proposal by Rizzi (1982), it was claimed that four properties cluster with the NSP: (i) null referential subjects, (ii) obligatory null expletives, (iii) free word order (subject-verb inversion) and (iv) that-trace effects. As the debate concerning this cluster of properties is not fundamental for the current dissertation study, I assume, along with Rothman (2009), that null referential subjects (see example (15)) and obligatory null expletives (see example (16)) cluster with the null subject setting of the NSP (but see Biberauer, Holmberg, Roberts & Sheehan 2010).

(15)a. En mi opinión, pro habla bien el italiano.
in my opinion, she/he speaks Italian well.
b. be æqide mæn pro italya‘i xub sohbæt mikon-e
   in opinion my Italian well speak-3.SG.PRES
   “In my opinion, she/he speaks Italian well.”

Examples (15a) and (15b) above show that in Spanish and Farsi, respectively, null referential subject pronouns are grammatical. The following examples examine expletive subjects.

\(^{14}\)Spanish has three types of verbs, classified in Spanish language textbooks by their infinitive form: –ar, –er and –ir verbs. The present tense verbal paradigm for –er and –ir verbs is slightly different from that of –ar verbs; however, it is regular.

\(^{15}\)Tense, verb class and person/number morphology are conflated in the examples above for ease of exposition.
Example (16a) shows that overt subject pronouns in expletive contexts are ungrammatical in standard Spanish and that a null subject is required as in (16b). In Farsi, however, we see that both (16c), which seemingly contains an expletive—*in*, and (16d) are grammatical. Karimi ultimately argues that *in* “this” is a demonstrative (2005, p. 92-93). Additionally, Farsi lacks the impersonal “there”. Differently from Spanish and other languages that have null expletives, Karimi claims that there is no evidence suggesting that they exist in Farsi. This claim is based largely on the fact that languages with expletives are subject to the Definiteness Effect:

(17) *There is John in the room.* (Karimi 2005, p. 93)

(18) There is a boy in the room.

Upon comparing examples (17) and (18), it is clear that only an indefinite subject may remain in the vP whereas definite subjects may not. Considering again the adverbial examples seen above
in (3) through (6), Karimi demonstrates that Farsi is not subject to the Definiteness Effect. Recall that adverbs adjoin to vP in Farsi; thus the definite subject of (6), repeated as (19) below, is internal to the vP.

(19) xoshbakhtânè kâmelan Kimea be hush umade  (Karimi 2005, p. 94) 
fortunately completely Kimea to sense come-3.SG.PRET
“Fortunately, Kimea has completely regained her senses.”

The lack of expletives in Farsi is seen as compatible with Karimi’s view of EPP satisfaction in Farsi (Karimi 2005, p. 94).

While the surface instantiation of the NSP appears to be very similar in Spanish and Farsi, two differences exist between the languages. The first, described in Section 3.2.1, relates to the way the EPP is satisfied in each language. Spanish satisfies the EPP with V-to-T movement while Farsi satisfies it morphologically within the vP. The second, described above, relates to the existence of expletive subjects in each language. These differences are important as they bear on the learning task of the native Farsi-speaking second language learner of Spanish, which is discussed in detail in Section 3.2.3.

3.2.2 Interface-conditioned Properties Related to the NSP

Two interface-conditioned properties related to the null subject setting of the NSP in Spanish and Farsi are discussed in Sections 3.2.2.1 and 3.2.2.2. The first property lies at the syntax-semantics interface while the latter lies at the syntax-discourse interface.

3.2.2.1 The Overt Pronoun Constraint (OPC)

In addition to Rizzi’s list of purported properties that cluster with the null subject setting of the NSP, Montalbetti (1984) added the OPC. The OPC is a restriction on the interpretation of overt referential subject pronouns. Montalbetti (1984, p. 26) describes this restriction as follows:

“A bound variable interpretation of an overt pronoun is prohibited if pro is available in the same
position.” Based on this restriction, it is expected that overt subject pronouns in null subject languages such as Spanish and Farsi may never be interpreted as a co-referential with a variable antecedent since pro is available in almost all subject positions. Examples (20) through (22) below show that this holds true for Spanish. In example (20), either the overt (20a) or null (20b) embedded clause subject pronoun can be co-referential with the matrix clause subject ese hombre “that man,” which is a non-variable Determiner Phrase. However, in the presence of a variable antecedent, for example cada persona “each person” in (21) or quién “who” as in (22), overt embedded clause subject pronouns cannot be interpreted as co-referential with the variable antecedent. The asterisk (*) associated with the subscript linking of cada persona and quién in (21a) and (22a), respectively, indicates this prohibition.

(20)a. Ese hombre_i cree que él_i es el mejor.
that man think-3.SG.PRES that he be-3.SG.PRES the best
b. Ese hombre_i cree que pro_i es el mejor.
that man think-3.SG.PRES that pro be-3.SG.PRES the best
“That man thinks that he is the best.”

(21)a. Cada persona_i cree que él_i es el mejor.
each person think-3.SG.PRES that he be-3.SG.PRES the best
b. Cada persona_i cree que pro_i es el mejor.
each person think-3.SG.PRES that pro be-3.SG.PRES the best
“Each person thinks that he/pro is the best.”

(22)a. ¿Quién_ii cree que él_i es el mejor?
who.SG think-3.SG.PRES that he be-3.SG.PRES the best
b. ¿Quién_ii cree que pro_i es el mejor?
who.SG think-3.SG.PRES that pro be-3.SG.PRES the best
“Who thinks that he is the best?”

Regarding Farsi, data from 39 native speakers who were independently tested (Judy & Feizmohammadpour 2012) demonstrate that the OPC obtains in Farsi as well. This dataset shows strong categorical preferences. For example, no variation was seen with respect to the interpretation of the null embedded clause subject in example (23b) below. In Farsi, the bound
interpretation was categorically preferred. The opposite scenario is seen in the presence of variable antecedents. Examples (24a) and (25a) show that the overt embedded clause subject \( u \) “he” can only be interpreted as disjoint with a variable matrix subject whereas the null embedded subject was only interpreted as bound in the presence of a variable matrix clause subject (see examples (24b) and (25b)).

(23)a. \( \text{Un mard}_i \text{ fekr mikonad ke } u_{ij} \text{ az hameh behtar-ast.} \) that man thought DUR-make-3.SG that he from all better-be-3.SG.PRES
b. \( \text{Un mard}_i \text{ fekr mikonad ke } \text{pro}_{ij} \text{ az hameh behtar-ast.} \) that man thought DUR-make-3.SG that pro from all better-be-3.SG.PRES
   “That man thinks that he/pro is the best.”

(24)a. \( \text{Har kasi}_i \text{ fekr mikonad ke } u_{ij} \text{ az hameh behtar-ast.} \) each person thought DUR-make-3.SG that he from all better-be-3.SG.PRES
b. \( \text{Har kasi}_i \text{ fekr mikonad ke } \text{pro}_{ij} \text{ az hameh behtar-ast.} \) each person thought DUR-make-3.SG that pro from all better-be-3.SG.PRES
   “Each person thinks that he is the best.”

(25)a. \( \text{Ki}_i \text{ fekr mikonad ke } u_{ij} \text{ az hameh behtar-ast?} \) who thought DUR-make-3.SG that he from all better-be-3.SG.PRES
b. \( \text{Ki}_i \text{ fekr mikonad ke } \text{pro}_{ij} \text{ az hameh behtar-ast?} \) who thought DUR-make-3.SG that pro from all better-be-3.SG.PRES
   “Who thinks that he is the best?”

Summarizing Kanno (1997, 1998) and Pérez-Leroux and Glass 1999, White (2003a) argues that the OPC constitutes a poverty-of-the-stimulus property since it is attested in a variety of the world’s languages (Greek, Korean, Portuguese and Spanish, for example) despite the fact that the interpretive constraints that fall out from it are not derivable from the input alone and are not taught in the classroom, nor can they be accounted for via domain-general learning strategies (for more information see Section 1.1). For these reasons, I concur with White in assuming that
the OPC is a poverty-of-the-stimulus property. Furthermore, following Rothman (2005, 2007, 2009), I take the OPC as a diagnostic of a null subject language.\textsuperscript{16}

In conclusion, examples (20) through (25) above demonstrate that null subject languages do not always require null subjects. More accurately, these languages permit both overt and null subjects. However, where optional, the interpretation of the subject pronoun may depend on such things as the type of matrix clause antecedent.

3.2.2.2 Discourse distribution of referential subject pronouns

Across many\textsuperscript{17} null subject languages (including the two languages relevant for this dissertation, Farsi and Spanish), the distribution of overt and null subjects is constrained by the discursive context and intended meaning. Thus, it is not the case that \textit{pro} and overt subject pronouns are in free variation, occurring by chance, but rather that discursive constraints drive the use of one form of over the other. Of course, there is much variation across all null subject languages; for example, Brazilian Portuguese uses overt subject pronouns more frequently than Spanish (Duarte 1993, 1995). With respect to the languages under investigation in the present study, Spanish and Farsi, distribution of referential subject pronouns is indistinguishable for the domains examined. As opposed to non-null subject languages like English, in which overt subject pronouns are required in expletive contexts, the use of overt referential subject pronouns in Spanish and Farsi is rather restricted, as would be expected by the APP (Chomsky 1981) and the availability of \textit{pro}.

\textsuperscript{16} The native speaker and L2 speaker groups of this study completed a task examining the OPC. The L2 speakers showed the restrictive constraints on the interpretation of overt embedded clause subjects in the presence of quantified antecedents, as predicted by the OPC. However, the OPC obtains in Farsi (Judy & Feizmohammadpour 2012), rendering it difficult to rule out L1 transfer effects in the current population.

\textsuperscript{17} Kissock (1995, p. 34) observes that in Telugu, a Dravidian language of the India subcontinent, “overt pronominal subjects seem to be present with about the same frequency as \textit{pro} and do not appear to mark any added emphasis or focus.”
Ample theoretical research has examined the distribution of overt and null subjects (Rigau 1986, 1988; Luján 1987, 1999; Fernández-Soriano 1989, 1993; Picallo 1994, 1998; Rizzi 1997; Alonso-Ovalle & D’Introno 2000; Sorace 2000, 2005; Alonso-Ovalle, Fernandez, Frazier, & Clifton 2002 and sources cited within). Building on this work, Rothman (2009) demonstrates the restrictions on the distribution of subjects in Spanish. In order to illustrate the parallel nature of the distribution of null and overt referential subject pronouns in Spanish and Farsi, the same examples provided by Rothman (2009) for Spanish are considered in Farsi. Starting with topics, which is discourse-given information, examples (26) and (27) demonstrate that null subjects are felicitously used in Topic Maintenance contexts while examples (28) and (29) demonstrate that overt subjects are preferred in Topic Shift contexts to remove ambiguity.

(26) María e Hilda no almorzaron hoy.
Mary and Hilda not eat-3.PL.PRET today
“Mary and Hilda did not eat lunch today.”

a. #18 Ellas tendrán mucha hambre.
they have-3.PL.FUT much hunger
b. pro tendrán mucha hambre.
pro have-3.PL.FUT much hunger
“They must be hungry.”

(27) Shabnam va Leila em ruz nahar nakhordand.
Shabnam and Leila today lunch NEG-eat-3.PL.PRET
“Shabnam and Leila did not eat lunch today.”

a. #Unha bayad goshneh bashand.
they must hungry be-3.PL.PRES
b. pro bayad goshneh bashand.
pro must hungry be-3.PL.PRES
“They must be hungry.”

18 In Rothman (2009), the judgment of this sentence in light of the preceding context is */?. Since there is no question regarding the grammaticality of this sentence, I have changed the judgment to # to represent the infelicitous, or odd, nature of the use of the overt subject given the context.
In examples (26) and (27) and their respective follow-up sentences seen in (26a) and (26b) and (27a) and (27b), there is no change in topic; that is, the subject of the context and follow-up sentence alike refers to the same two women: María and Hilda in (26) and Shabnam and Leila in (27). Thus, the topic of the sentence has been maintained (hence the term Topic Maintenance) rendering the use of the overt subject pronoun ellas or unha “they” in (26a) and (26a) infelicitous as it is unnecessary whereas the use of pro in (27b) and (27b) is felicitous.

In contrast to the examples above, examples (28) and (29) show a Topic Shift context, or a context in which the topic changes.

(28) No almorcé hoy.
 pro not eat-1.SG-PRET today
“I did not eat lunch today.”

   a. Ellas piensan que tengo hambre ahora.
      they think-3.PL-PRES that pro have-1.SG-PRES hunger now
   b. # pro piensan que tengo hambre ahora.
      pro think-3.PL-PRES that pro have-1.SG-PRES hunger now
   “They must think I am hungry.”

(29) Man em ruz nahar nakhordam.
 I today lunch NEG-eat-1.SG-PRET
“I did not eat lunch today.”

   a. Unha fekr mikonand ke goshneh basham.
      they thought DUR-do.3.PL that pro hungry be-1.SG-PRES
   b. #pro fekr mikonand ke goshneh basham.
      pro thought DUR-do.3.PL that pro hungry be-1.SG-PRES
   “They must think that I am hungry.”

In examples (28) and (29) and the corresponding follow-up sentences, a change in topic occurs as the subject of (28) and (29) are yo and man “I,” respectively, whereas the matrix subject of the follow-up sentences is ellas and unha “they,” respectively. Consequently, the presence of the

19 In Rothman (2009), the judgment of this sentence in light of the preceding context is ungrammatical (*). Since there is no question regarding the grammaticality of this sentence, I have changed the judgment to # to represent the infelicitous, or odd, nature of the use of the overt subject given the context.
overt subject pronoun *ellas/unha* “they” is felicitously used to identify the matrix subject. On the contrary, the use of *pro* is infelicitous.

Examples (30) and (31) show a focus (discourse new information) question while examples (32) and (33) show a yes/no question.

(30) ¿Quiénes vieron la película?
   “Who all saw the movie?”

   a. Nosotros la vimos.
      we it-CL-FEM see-1.PL-PRET
   b. # pro la vimos.
      pro it-CL-FEM see-1.PL-PRET

   “We saw it.”

(31) Ki-ha film-râ didand?
   “Who all saw the movie?”

   a. Ma didim-esh.
      we see-1.PL-PRET-it-CL
   b. # pro didim-esh.
      pro see-1.PL-PRET-it-CL

   “We saw it.”

The focus questions in (30) and (31) ask for new information, specifically, for the subject of the predicate “see the movie.” Foci contexts require the use of an overt subject pronoun as in the (a) examples; the use of *pro* in this context is infelicitous. Examples (32) and (33) show a yes/no question. Answers to yes/no questions that contain overt subject pronouns are infelicitous as seen in the (a) examples, whereas those containing null subject pronouns, as in the (b) examples, are felicitous.

---

20 As in previous examples, the judgment of this sentence in light of the preceding context has been changed from ungrammatical (*) as in Rothman (2009) to infelicitous (#).
(32) ¿Vieron Uds. la película?
“Did you guys see the movie?”

a. #Sí nosotro la vimos.
  yes we it-CL see-1.PL.PRET
b. Sí pro la vimos.
yes pro it-CL see-1.PL.PRET
“Yes, we saw it.”

(33) Shoma-ha film-râ didid?
you-PL movie-DOM see-2.PL.PRET
“Did you all see the movie?”

a. #Are ma didim-esh.
yea we see-1.PL.PRET-it
b. Are pro didim-esh.
yea pro see-1.PL.PRET-it
“Yea, we saw it.”

Examples (34) and (35) show subject use in Contrastive Focus contexts, which are contexts that create a contrast between two entities of the sentence (e.g. the subjects).

(34) O te lo digo yo o te lo dice ella.
or you-DAT it-ACC tell.1.SG.PRES I or you.DAT it-ACC tell.3.SG.PRES she
“Either I will tell you or she will tell you.”

a. Quiero que me lo digas tú.
b. pro want.1.SG.PRES that me-DAT it-ACC tell.2.SG.-PRES-SUBJ you
“I want you to tell it to me [and not her].”

(35) Man be to beguyam ya Shabnam be to beguyad.
I to you tell.1.SG.PRES or Shabnam to you tell.3.SG.PRES
“Either I tell you or Shabnam tells you.”

a. Man mixam ke to be man beguyi.
  I DUR-want.1.SG that you to me tell.2.SG.PRES
b. #Man mixam ke pro be man beguyi.
  I DUR-want.1.SG that pro to me tell.2.SG.PRES
“I want you to tell me.”

21 This grammaticality of this sentence was questioned in Rothman (2009), as indicated by (?); however, it has been changed to infelicitous (#) here since it is a licit sentence in Spanish.
We see in the follow-up sentences in (34a) and (35a) that the use of the overt subject pronoun "tú" and "you" is felicitous whereas "pro", in the (b) examples, is infelicitous (but see Matos Amaral & Schwenter 2005). Finally, consider the Phonological Focus examples seen in (36) and (37).

(36) Nunca pensé que tuvieras que ir a buscar el paquete.
Never pro think-1.SG.PRET that pro have-2.SG.IMP.SUBJ. that go-INF to
get-INF the package
“I never thought you would have to go get the package.”

a. Juan me dijo que él lo recogería.
John me-DAT tell-3.SG-PRET that he it-ACC get-3.SG.COND
b. #Juan me dijo que pro lo recogería.
John me-DAT tell-3.SG-PRET that pro it-ACC get-3.SG.COND
“John told me he would get it.”

(37) Man hich vaqt fekr nemikardam ke to majboor
I no time thought NEG-IND-do-1.SG that you force
beshi beravi baste-râ begiri.
SUBJ-become.PRES-2.SG SUBJ-go.PRES-2.SG package-DOM SUBJ-grab.PRES-2.SG
“I never thought that you would have to go get the package.”

a. Shamim be man goft ke u miravad va migirad-esh.
Shamim to me say-3.SG.PRET that he DUR-go.3.SG and DUR-grab.3.SG-it
b. #Shamim be man goft ke pro miravad va migirad-esh.
Shamim to me say-3.SG.PRET that pro DUR-go.3.SG and DUR-grab.3.SG-it
“Shamim told me that he would go and get it.”

Farsi, like Spanish and English, can assign phonological stress to pronouns in order to establish focus. Clearly, the pronoun must be overt in order to do so; thus, phonological focus is properly established in example (36a) and (37a) but not (36b) (37b) due to the lack of the overt subject pronoun in the latter example. If the subject pronoun is null, no phonological stress can be assigned to it.

To summarize, Table 3-2 below shows the discourse-constrained distribution of referential subject pronouns for Spanish and Farsi.
Table 3-2. Subject distribution in Spanish and Farsi

<table>
<thead>
<tr>
<th>Topic Maintenance</th>
<th>Spanish</th>
<th>Farsi</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Topic Shift</td>
<td>Overt</td>
<td>Overt</td>
<td></td>
</tr>
<tr>
<td>Contrastive Focus</td>
<td>Overt</td>
<td>Overt</td>
<td></td>
</tr>
<tr>
<td>Yes/No question</td>
<td>Null</td>
<td>Null</td>
<td></td>
</tr>
<tr>
<td>Subject Focus question</td>
<td>Overt</td>
<td>Overt</td>
<td></td>
</tr>
<tr>
<td>Phonological Focus</td>
<td>Overt</td>
<td>Overt</td>
<td></td>
</tr>
</tbody>
</table>

It is not surprising that two null subject languages such as Spanish and Farsi should behave similarly with respect to the distribution of overt and null subjects. In fact, data from Judy and Feizmohammadpour (2012) noted above demonstrates that for Contrastive Focus contexts, the speakers overwhelmingly accept overt subject pronouns and reject null subject pronouns. However, for Topic Maintenance contexts, the speakers overwhelmingly reject overt subject pronouns and accept null subject pronouns. Finally, there is a clear preference for overt subject pronouns in Topic Shift contexts. These results are expected. Even so, the parallel behavior between the two languages is important for the aims of the current study. The most recent version of the Interface Hypothesis (IH; Sorace 2011) asserts that interface vulnerability obtains as a result of bilingualism (i.e. the presence of two grammars) and, crucially, not because of language-specific differences (parametric, semantic, discourse or otherwise). The testable prediction that derives from this claim is that underlying syntactic and/or discourse similarities between two languages do not give the language learner an advantage with respect to convergence on interface-conditioned properties. Thus, near-native second language learners of Spanish are predicted to show vulnerability regarding referential subject pronoun distribution in Spanish whether their native language has the opposite parameter setting or the same parameter value and discourse distribution of subjects as in the current study.
3.2.3 Learning Task: NSP

While Spanish and Farsi share the same setting for the NSP, important differences exist between the two languages that second language learners must overcome if they are to converge on related properties. The first difference, as explained in Section 3.2.1 above, is related to word order and movement. Spanish, as opposed to Farsi, does not allow all phrasal elements to remain in the vP. Additionally, while Spanish and Farsi are both head-first, right-branching languages, Farsi is a verb-final language. The second difference pertains to satisfaction of the EPP, with Spanish satisfying this principle via V-to-Tense movement and Farsi doing so morphologically. A related effect is that nominative Case is checked and valued in Spec,TP in Spanish, but in Spec,vP in Farsi. Finally, if Karimi’s analysis of expletive subjects in Farsi is correct, these learners must also acquire expletives in Spanish. Thus, while the superficial representation of the two grammars appears analogous, the underlying representations are such that grammatical restructuring is necessary in second language acquisition of Spanish by native Farsi speakers. The question that arises then is: how will grammatical restructuring come about? Sprouse, echoing Schwartz and Sprouse (1994, 1996) and White (2003a), claims that “interlanguage development is failure-driven, in the sense that the grammar undergoes revision in response to the inability to grammatically license parses of input” (2011, p. 98). In essence, parsing failures must obtain in order for restructuring to occur. In this case, native Farsi speakers learning Spanish as a second language must recognize that word order in Spanish is Subject-Verb-Object. There is ample evidence for this in the input. Furthermore, these same learners must recognize that Spec,vP in Spanish does not check/value nominative Case, but rather that this is accomplished in Spec,TP thus requiring subjects to leave the vP. Restrictions on adverbial placement in Spanish (see example (38) below) may provide the necessary impetus for
restructuring in this case, ultimately demonstrating to the Farsi speaker that the subject cannot
remain within the vP shell:

(38)a. Yo siempre voy a la biblioteca.
   I always go.1.SG.PRES to the library
b. *Siempre yo voy a la biblioteca.
   always I go.1.SG.PRES to the library
   “I always go to the library.”
CHAPTER 4
METHODOLOGY

4.1 General Introduction

The goals of this chapter are to describe the methodology of the present study as well as to justify the specific tasks employed in light of the Interface Hypothesis (IH). The chapter opens with a brief summary of the IH (see Section 2.2 for details) and a review of the research questions, which together motivate the particular methodological design. The remainder of the chapter describes the participants and methodological design in detail.

4.2 Motivation for the Study

In an effort to explain the observable differences between ultimate attainment in L1 acquisition and adult second language (L2) acquisition, various global and local impairment hypotheses have been put forward by generative researchers in recent decades, but to date the results are inconsistent. For example, while the Critical Period Hypothesis (Lenneberg 1967; Coppetiers 1987; Johnson & Newport 1989) and its extension to adult L2 acquisition spurred much research within the generative paradigm, the preponderance of the evidence produced by these empirical studies (see White 2003a, 2008, 2011a) indicates that global impairment of this type (i.e. inaccessibility to UG) is improbable. Importantly, adult L2 acquirers have demonstrated convergence on poverty of the stimulus properties for which the information necessary for convergence is (a) not present in the linguistic input, (b) is not explicitly taught nor (c) can be accounted for via domain-general learning strategies (Schwartz 1998; Schwartz & Sprouse 2000; Rothman 2008b; Rothman & Iverson 2008). For instance, Rothman and Iverson (2008) investigate English-speaking L2 learners’ convergence on the syntax of grammatical aspect as well as a related POS semantic property in Brazilian Portuguese. Specifically, in sentences with adverbial quantification of universal force (e.g. sempre “always”), Determiner
Phrase (DP) subjects such as *os romanos* “the Romans” may have a kind- or group-denoting reading with imperfective aspect, whereas they may only take the group-denoting reading in sentences with perfective aspect (Menéndez-Benito, p. 2001). While the imperfect and preterit aspect is quite frequent in the input the learners are exposed to, the restriction on the interpretation of the DP subject in adverbially quantified sentences is not available from the input alone nor is this distinction explicitly taught. Since the linguistic input that the learners are exposed to does not provide them with these restricted interpretations, nor would it be apparent to the learner that their interpretation was non-target-like, no domain-general learning strategies can be applied. Even so, researchers that assume continued access to UG in adult L2 acquirers are charged with describing and explaining the undeniable differences between L1 and adult L2 attainment. While numerous theoretical proposals have attempted this task over the past decade (e.g. Prosodic Transfer Hypothesis, Goad et al. 2003; Goad & White 2006, 2008; Feature Re-Assembly Hypothesis, Lardiere 2008, 2009; Choi & Lardiere 2006, among others), the proposal motivating the present study is the most recent version of the IH (Sorace 2011).

The IH, while remaining agnostic with respect to accessibility to UG, attempts to reconcile the observed convergence demonstrated by adult L2 acquirers (White 2003a, 2011a) with the observable ultimate attainment differences between L1 and adult L2 acquisition. By differentiating between properties that require the integration of linguistic and cognitive information (i.e. external interface-conditioned properties) and those that only concern linguistic information (i.e. syntactic properties), the IH endeavors to describe and explain convergence in some areas (syntax) and non-convergence in others (external interface-conditioned properties). Vulnerability in bilinguals is purported to be a result of the increased stress placed on finite cognitive resources (see Wilson et al. 2009; Sorace 2011). That is, unlike monolinguals,
must manage only one linguistic system, bilinguals must divide their cognitive resources in order to inhibit (but not completely turn off; see Marian & Spivey 2003; Costa, 2005; Dijkstra 2005; Kroll, Bobb, & Wodniecka 2006; Schwartz, Kroll, & Diaz 2007), the non-relevant linguistic system while simultaneously activating the other (Green 1986, 1998; Kroll & Stewart 1994; Bialystok 2009; Kroll, Bogulski, & McClain 2012).

Recapping the research questions first outline in Section 1.4, the present study tests the explanatory power of the IH by examining the following research questions. First, the question of whether near-native second language learners demonstrate more divergence with respect to external interface-conditioned properties as opposed to purely syntactic ones in offline tasks is examined. With respect to this question, the IH predicts that near-native L2 speakers will show divergence on external interface-conditioned properties, such as the discourse distribution of subjects. Convergence on syntactic properties is predicted to be possible, but not guaranteed, as research has shown that it is less costly to process pure syntax as compared to an interface-conditioned property (see Sorace 2011, p. 15 and sources cited therein). Secondly, this study asks whether near-native second language learners exhibit greater processing difficulties with external interface-conditioned properties as compared to purely syntactic ones in online tasks. Here again, the IH predicts processing difficulties for external interface-conditioned properties, and possibly, but not necessarily, for syntactic properties. Finally, the question of whether near-native second language learners perform more native-like in offline tasks as compared to online tasks is explored. Since the IH claims that the source of divergence in near-native L2 learners is language processing, it is expected that differences will obtain on the online tasks. However, it is also possible that differences will obtain on the offline and online tasks alike. While a number of studies have tested the IH’s predictions (see Section 2.3), a larger variety of properties and
language pairings must be tested in order for the findings to be taken as generalizable. Equally as important is the testing method employed in studies testing the predictions of the IH. That is, since the IH claims that the presence of two linguistic systems results in an increased processing burden and that this is the locus of differences in ultimate attainment, online measures must be employed in order to determine if differences in processing are indeed observable. Sorace does not preclude processing differences from affecting L2 learners’ performance in offline measures; however, in the case that convergence on external-interface conditioned properties may be found, one cannot be certain that this is not a product of metalinguistic knowledge. By employing online methodology, the potential effect of metalinguistic knowledge is lessened, and more importantly, the processing of external-interface conditioned properties may be tested via reaction time (RT) data (see Sorace 2011, p. 20).

Accordingly, the language pairing, the property tested and the type of experimental tasks of the current study were purposefully selected in order to advance previous research and address the most recent claims of the IH. Specifically, the distribution of referential subject pronouns, although extensively studied before, is examined in a new language pairing: Farsi-Spanish bilinguals. While Spanish and Farsi are both null subject languages, a combination of the likes that was studied in Bini (1993), Lozano (2002), Margaza and Bel (2006), Prada Pérez (2010) and García-Alcaraz and Bel (2011), this pairing innovates in a way that the studies cited above do not: the underlying syntax of Farsi and Spanish is different (see Section 3.2), yet they share analogous distributions of referential subject pronouns. Thus, simple transfer of the L1 values would not result in full convergence on all properties tested herein. Rather, the participants are faced with the learning task described in Section 3.2.3. Finally, both offline tasks (which tap
competence) and online tasks (which measure the participants’ processing) are employed, thus allowing the IH’s claims regarding the effect of bilingualism on processing to be tested.

4.3 Participants

Two participant groups completed all non-experimental and experimental tasks described in Sections 4.4 and 4.5 below. The native Spanish-speaking group consisted of 24 participants while the second language group (L2) consisted of eight native Farsi-speaking adults that were first exposed to Spanish after puberty. All participants had normal or corrected-to-normal vision and no linguistic or reading impairment. Completion of all tasks was voluntary; however participants were monetarily compensated for their time. Native Spanish-speaking participants were largely recruited through direct contact with the Facultad de Filosofía y Letras (Sede Puan), Universidad de Buenos Aires, word of mouth among recruited participants and personal contacts. The L2 speakers were contacted through personal contacts. With respect to the native speakers, participation in the study was contingent upon (i) having been exposed to River Plate Spanish since birth and, while most participants had basic knowledge of a second language (in most cases English), (ii) they had little fluency and used the second language minimally (see Section 4.4.1). For the L2 speakers, participation was contingent upon (i) having been born in Iran (and thus exposed to Farsi since birth), (ii) having been first exposed to Spanish naturalistically and post-puberty (see Section 4.4.1) and (iii) having scored a minimum of 45/50 on the Proficiency Measure (see Section 4.4.2). Section 4.4 describes the demographic and linguistic characteristics of both participant groups as well as the proficiency measure, the tasks measuring working memory and inhibitory control and the participants’ scores on these tasks.

4.4 Non-experimental Tasks

In addition to the online and offline experimental tasks (see Section 4.5), both participant groups completed two non-experimental tasks: a Background Questionnaire and a proficiency
measure. The motivation and significance of each task are described below in Sections 4.4.1 through 4.4.4.

4.4.1 Background Questionnaire

A short Background Questionnaire was completed by all participants in order to obtain demographical information regarding age, gender and country of origin as well as past and present linguistic experience. Specifically, participants were asked to provide information regarding items such as the age at which they were first exposed to Spanish, the language(s) spoken in their childhood homes as well as their current homes, the type and amount of formal instruction they have had with Spanish, other languages spoken and their current proficiency level. Table 4-1 below summarizes the demographical data for both participant groups while Tables 4-2 through 4-3 and 4-4 through 4-5, respectively, summarize the linguistic information obtained from the Background Questionnaire for the native speakers and the L2 speakers.

Table 4-1 shows that all native speaker participants were born in Argentina and are native speakers of Argentina Spanish. This is important since the majority of the L2 speakers’ exposure to Spanish is to this distinct dialect; thus, the linguistic group to which the L2 speakers are compared is homogenous in terms of dialect and representative of the dialect to which the L2 speakers are exposed. Of the native speaker participants, 14 were female and 10 were male. The average age of the native speaker participants at the time of testing was 29.3 years (range 20-62 years, median 25 years). Regarding the L2 speakers, all were born in Iran. Of the L2 speakers, three were female and five were male. Their average age was 51.8 years (range 43-58 years, median 53.5 years).
Table 4-1. Demographical information

<table>
<thead>
<tr>
<th>Participant</th>
<th>Age</th>
<th>Gender</th>
<th>Birth Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Native</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>21</td>
<td>Female</td>
<td>Argentina</td>
</tr>
<tr>
<td>4</td>
<td>25</td>
<td>Male</td>
<td>Argentina</td>
</tr>
<tr>
<td>5</td>
<td>21</td>
<td>Male</td>
<td>Argentina</td>
</tr>
<tr>
<td>6</td>
<td>27</td>
<td>Female</td>
<td>Argentina</td>
</tr>
<tr>
<td>7</td>
<td>23</td>
<td>Male</td>
<td>Argentina</td>
</tr>
<tr>
<td>8</td>
<td>30</td>
<td>Male</td>
<td>Argentina</td>
</tr>
<tr>
<td>9</td>
<td>24</td>
<td>Female</td>
<td>Argentina</td>
</tr>
<tr>
<td>10</td>
<td>25</td>
<td>Female</td>
<td>Argentina</td>
</tr>
<tr>
<td>11</td>
<td>27</td>
<td>Female</td>
<td>Argentina</td>
</tr>
<tr>
<td>12</td>
<td>38</td>
<td>Male</td>
<td>Argentina</td>
</tr>
<tr>
<td>13</td>
<td>25</td>
<td>Male</td>
<td>Argentina</td>
</tr>
<tr>
<td>14</td>
<td>29</td>
<td>Male</td>
<td>Argentina</td>
</tr>
<tr>
<td>15</td>
<td>48</td>
<td>Male</td>
<td>Argentina</td>
</tr>
<tr>
<td>16</td>
<td>20</td>
<td>Female</td>
<td>Argentina</td>
</tr>
<tr>
<td>17</td>
<td>24</td>
<td>Female</td>
<td>Argentina</td>
</tr>
<tr>
<td>18</td>
<td>23</td>
<td>Male</td>
<td>Argentina</td>
</tr>
<tr>
<td>19</td>
<td>25</td>
<td>Female</td>
<td>Argentina</td>
</tr>
<tr>
<td>20</td>
<td>62</td>
<td>Female</td>
<td>Argentina</td>
</tr>
<tr>
<td>21</td>
<td>61</td>
<td>Female</td>
<td>Argentina</td>
</tr>
<tr>
<td>22</td>
<td>25</td>
<td>Female</td>
<td>Argentina</td>
</tr>
<tr>
<td>23</td>
<td>24</td>
<td>Female</td>
<td>Argentina</td>
</tr>
<tr>
<td>24</td>
<td>24</td>
<td>Female</td>
<td>Argentina</td>
</tr>
<tr>
<td>25</td>
<td>30</td>
<td>Female</td>
<td>Argentina</td>
</tr>
<tr>
<td>26</td>
<td>22</td>
<td>Male</td>
<td>Argentina</td>
</tr>
</tbody>
</table>

Average 29.3
St. Dev. 11.6

L2

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>56</td>
<td>Female</td>
<td>Iran</td>
</tr>
<tr>
<td>2</td>
<td>48</td>
<td>Male</td>
<td>Iran</td>
</tr>
<tr>
<td>3</td>
<td>43</td>
<td>Female</td>
<td>Iran</td>
</tr>
<tr>
<td>4</td>
<td>44</td>
<td>Male</td>
<td>Iran</td>
</tr>
<tr>
<td>5</td>
<td>53</td>
<td>Male</td>
<td>Iran</td>
</tr>
<tr>
<td>6</td>
<td>54</td>
<td>Male</td>
<td>Iran</td>
</tr>
<tr>
<td>7</td>
<td>58</td>
<td>Female</td>
<td>Iran</td>
</tr>
<tr>
<td>8</td>
<td>58</td>
<td>Male</td>
<td>Iran</td>
</tr>
</tbody>
</table>

Average 51.8
St. Dev. 6.02

1 Participants 1 and 2 data were lost. To maintain the faithfulness of the coding schema for the remaining data, all tables begin with native speaker participant 3.
Table 4-2 provides information regarding the native speaker participants’ linguistic background. From Table 4-2, it is evident that while some of the native Spanish-speaking participants have knowledge of another language (English in most cases), their dominant language is Spanish. Of the 15 participants that have knowledge of a language besides Spanish, 13 had studied English (ranging from mostly basic proficiency levels to intermediate and advanced), two had studied French (reaching basic proficiency levels), one had studied Italian and one had studied Portuguese (each reaching basic proficiency levels).

Table 4-2. Native speaker linguistic information: languages spoken other than Spanish

<table>
<thead>
<tr>
<th>Native</th>
<th>Other languages spoken</th>
<th>Proficiency level of other language(s)</th>
<th>Dominant language</th>
<th>Language spoken as a child at home</th>
<th>Languages spoken at home currently</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>English</td>
<td>advanced</td>
<td>Spanish</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>4</td>
<td>-----</td>
<td>-----</td>
<td>Spanish</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>5</td>
<td>English</td>
<td>intermediate</td>
<td>Spanish</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>6</td>
<td>-----</td>
<td>-----</td>
<td>Spanish</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>7</td>
<td>English</td>
<td>basic</td>
<td>Spanish</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>8</td>
<td>-----</td>
<td>-----</td>
<td>Spanish</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>9</td>
<td>English/Italian</td>
<td>basic (both)</td>
<td>Spanish</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>10</td>
<td>English</td>
<td>intermediate</td>
<td>Spanish</td>
<td>Guaraní</td>
<td>-----</td>
</tr>
<tr>
<td>11</td>
<td>-----</td>
<td>-----</td>
<td>Spanish</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>12</td>
<td>-----</td>
<td>-----</td>
<td>Spanish</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>13</td>
<td>English</td>
<td>basic</td>
<td>Spanish</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>14</td>
<td>English</td>
<td>basic</td>
<td>Spanish</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>15</td>
<td>-----</td>
<td>-----</td>
<td>Spanish</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>16</td>
<td>English/French</td>
<td>basic (both)</td>
<td>Spanish</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>17</td>
<td>English</td>
<td>basic</td>
<td>Spanish</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>18</td>
<td>-----</td>
<td>-----</td>
<td>Spanish</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>19</td>
<td>English</td>
<td>intermediate</td>
<td>Spanish</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>20</td>
<td>French</td>
<td>basic</td>
<td>Spanish</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>21</td>
<td>English</td>
<td>basic</td>
<td>Spanish</td>
<td>-----</td>
<td>Daughter learning English</td>
</tr>
<tr>
<td>22</td>
<td>-----</td>
<td>-----</td>
<td>Spanish</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>23</td>
<td>-----</td>
<td>-----</td>
<td>Spanish</td>
<td>-----</td>
<td>Sister learning English</td>
</tr>
<tr>
<td>24</td>
<td>English</td>
<td>basic</td>
<td>Spanish</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>25</td>
<td>English</td>
<td>basic</td>
<td>Spanish</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>26</td>
<td>Portuguese</td>
<td>basic</td>
<td>Spanish</td>
<td>Farsi</td>
<td>-----</td>
</tr>
</tbody>
</table>
Only two participants were exposed to a language other than Spanish as a child, but both participants reported having no knowledge (other than select lexical items) of the language. Similarly, only two participants reported being exposed to a language other than Spanish in their current home: each had a family member learning English and were therefore exposed to occasional conversations or English media sources. Finally, nine participants claimed to have no knowledge of a language other than Spanish.

Table 4-3 below provides further linguistic information for the native speaker participants. All native speaker participants were exposed to Spanish from birth via family members and their surrounding environment. Twenty-two participants reported having received formal instruction regarding the Spanish language, mostly in primary and secondary language arts courses, but also at the university in some cases. The approximate number of years of formal instruction, assuming primary through secondary instruction, is 12 years. Finally, 21 native speaker participants reported using Spanish\(^2\) 100% of the time (range 80\(^3\)-100%, median 100%).

### Table 4-3. Native speaker linguistic information regarding Spanish

<table>
<thead>
<tr>
<th>Native</th>
<th>Age of first exposure</th>
<th>Formal instruction(^4)</th>
<th>Duration of instruction</th>
<th>% daily use of Spanish</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>birth</td>
<td>Yes</td>
<td>secondary school</td>
<td>100</td>
</tr>
<tr>
<td>4</td>
<td>birth</td>
<td>No</td>
<td>-----</td>
<td>100</td>
</tr>
<tr>
<td>5</td>
<td>birth</td>
<td>Yes</td>
<td>primary - secondary school</td>
<td>100</td>
</tr>
<tr>
<td>6</td>
<td>birth</td>
<td>No</td>
<td>-----</td>
<td>100</td>
</tr>
<tr>
<td>7</td>
<td>birth</td>
<td>Yes</td>
<td>secondary school/university</td>
<td>100</td>
</tr>
<tr>
<td>8</td>
<td>birth</td>
<td>Yes</td>
<td>primary - secondary school</td>
<td>100</td>
</tr>
<tr>
<td>9</td>
<td>birth</td>
<td>Yes</td>
<td>university</td>
<td>100</td>
</tr>
</tbody>
</table>

\(^2\) This item specifically asked how much time the participants read/write/speak/listen to Spanish (and not another language) on a regular day.

\(^3\) Participant 14 reported reading the New York Times in English on a daily basis, which is what he counted as 20% use of another language.

\(^4\) All participants attended primary and secondary school in Buenos Aires, Argentina and thus likely received formal instruction regarding the Spanish language.
Table 4-3. Continued

<table>
<thead>
<tr>
<th>Native</th>
<th>Age of first exposure</th>
<th>Formal instruction</th>
<th>Duration of instruction</th>
<th>% daily use of Spanish</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>birth</td>
<td>Yes</td>
<td>primary school - university</td>
<td>100</td>
</tr>
<tr>
<td>11</td>
<td>birth</td>
<td>Yes</td>
<td>12 years</td>
<td>100</td>
</tr>
<tr>
<td>12</td>
<td>birth</td>
<td>Yes</td>
<td>primary school</td>
<td>100</td>
</tr>
<tr>
<td>13</td>
<td>birth</td>
<td>Yes</td>
<td>12 years</td>
<td>100</td>
</tr>
<tr>
<td>14</td>
<td>birth</td>
<td>Yes</td>
<td>13 years</td>
<td>80</td>
</tr>
<tr>
<td>15</td>
<td>birth</td>
<td>Yes</td>
<td>secondary school - university</td>
<td>100</td>
</tr>
<tr>
<td>16</td>
<td>birth</td>
<td>Yes</td>
<td>primary school - university</td>
<td>100</td>
</tr>
<tr>
<td>17</td>
<td>birth</td>
<td>Yes</td>
<td>primary school – university</td>
<td>100</td>
</tr>
<tr>
<td>18</td>
<td>birth</td>
<td>Yes</td>
<td>primary school - university</td>
<td>100</td>
</tr>
<tr>
<td>19</td>
<td>birth</td>
<td>Yes</td>
<td>primary school - university</td>
<td>100</td>
</tr>
<tr>
<td>20</td>
<td>birth</td>
<td>Yes</td>
<td>primary - secondary school</td>
<td>95</td>
</tr>
<tr>
<td>21</td>
<td>birth</td>
<td>Yes</td>
<td>primary - secondary school</td>
<td>100</td>
</tr>
<tr>
<td>22</td>
<td>birth</td>
<td>Yes</td>
<td>primary - secondary school</td>
<td>100</td>
</tr>
<tr>
<td>23</td>
<td>birth</td>
<td>Yes</td>
<td>primary school/university</td>
<td>100</td>
</tr>
<tr>
<td>24</td>
<td>birth</td>
<td>Yes</td>
<td>primary - secondary school</td>
<td>95</td>
</tr>
<tr>
<td>25</td>
<td>birth</td>
<td>Yes</td>
<td>primary school - university</td>
<td>100</td>
</tr>
<tr>
<td>26</td>
<td>birth</td>
<td>Yes</td>
<td>11 years</td>
<td>100</td>
</tr>
</tbody>
</table>

Average 98.75  St. Dev. 4.23

Table 4-4 provides the L2 speaker participants’ linguistic information. From Table 4-4, we see that all L2 speakers were raised in Farsi-speaking homes and that in all but one case (participant 6), Farsi is currently spoken at home. Regarding other languages spoken, Farsi is spoken natively by all L2 speakers and four of the participants have basic knowledge of one other language (Arabic in the case of participant 1, Portuguese in the cases of participants 3 and 4 and English in the case of participant 6). However, none of these third languages is currently spoken by the L2 participants. Interestingly, three of the native Farsi speakers consider their dominant language to be Spanish, while five consider their dominant language to be Farsi.

---

5 All participants attended primary and secondary school in Buenos Aires, Argentina and thus likely received formal instruction regarding the Spanish language.
Table 4-4. L2 speaker linguistic information: languages spoken other than Spanish

<table>
<thead>
<tr>
<th>L2</th>
<th>Other languages spoken</th>
<th>Proficiency level of other language(s)</th>
<th>Dominant language</th>
<th>Language spoken as a child at home</th>
<th>Languages spoken at home currently</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Farsi, Arabic</td>
<td>native, basic</td>
<td>Farsi</td>
<td>Farsi</td>
<td>Farsi</td>
</tr>
<tr>
<td>2</td>
<td>Farsi</td>
<td>Native</td>
<td>Spanish</td>
<td>Farsi</td>
<td>Spanish, Farsi</td>
</tr>
<tr>
<td>3</td>
<td>Farsi, Portuguese</td>
<td>native, basic</td>
<td>Farsi</td>
<td>Farsi</td>
<td>Farsi</td>
</tr>
<tr>
<td>4</td>
<td>Farsi, Portuguese</td>
<td>native, basic</td>
<td>Farsi</td>
<td>Farsi</td>
<td>Farsi</td>
</tr>
<tr>
<td>5</td>
<td>Farsi, Portuguese</td>
<td>native, basic</td>
<td>Spanish</td>
<td>Farsi</td>
<td>Farsi</td>
</tr>
<tr>
<td>6</td>
<td>English</td>
<td>Basic</td>
<td>Farsi</td>
<td>Farsi</td>
<td>Spanish</td>
</tr>
<tr>
<td>7</td>
<td>Farsi</td>
<td>Native</td>
<td>Spanish</td>
<td>Farsi</td>
<td>Farsi</td>
</tr>
<tr>
<td>8</td>
<td>Farsi</td>
<td>Native</td>
<td>Farsi</td>
<td>Farsi</td>
<td>Farsi</td>
</tr>
</tbody>
</table>

Table 4-5. L2 speaker linguistic information regarding Spanish

<table>
<thead>
<tr>
<th>L2</th>
<th>Age of first exposure</th>
<th>Formal instruction⁶</th>
<th>Duration of instruction</th>
<th>% daily use of Spanish</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>22</td>
<td>Yes</td>
<td>One class per week, less than one year</td>
<td>95</td>
</tr>
<tr>
<td>2</td>
<td>17</td>
<td>Yes</td>
<td>2 years of secondary school</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>18</td>
<td>No</td>
<td></td>
<td>90</td>
</tr>
<tr>
<td>4</td>
<td>21</td>
<td>No</td>
<td></td>
<td>90</td>
</tr>
<tr>
<td>5</td>
<td>19</td>
<td>No</td>
<td></td>
<td>100</td>
</tr>
<tr>
<td>6</td>
<td>17</td>
<td>Yes</td>
<td>Less than 5 months</td>
<td>95</td>
</tr>
<tr>
<td>7</td>
<td>26</td>
<td>No</td>
<td></td>
<td>100</td>
</tr>
<tr>
<td>8</td>
<td>24</td>
<td>No</td>
<td></td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>Average 20.5</td>
<td></td>
<td></td>
<td>93.75</td>
</tr>
<tr>
<td></td>
<td>St. Dev. 3.34</td>
<td></td>
<td></td>
<td>6.94</td>
</tr>
</tbody>
</table>

Table 4-5 above provides further linguistic information for the L2 speaker participants.

All L2 speaker participants were exposed to Spanish for the first time post-puberty at an average age of 20.5 years (range 17-26 years, median 20). Only three participants reported having received formal instruction regarding the Spanish language, while the other five participants reported having learned the language naturalistically. Those that attended formal classes reported

⁶ All participants attended primary and secondary school in Buenos Aires, Argentina and thus likely received formal instruction regarding the Spanish language.
learning more from their environment than from the classroom. Finally, the self-reported average percent daily use of Spanish was 93.75% (range 80-100%, median 97.5%).

4.4.2 Proficiency Measure

Proficiency measures are now standard practice in L2 acquisition studies. However, since the claims made by the IH are only valid for near-native speakers (non-convergence at lower proficiency levels may simply be a result of insufficient exposure to input), the proficiency scores obtained herein are crucial for the goals of the experiment. Hulstijn (2010) reviewed several proficiency tests, two of which are relevant for the goals of this study: the vocabulary and cloze tests. Vocabulary and cloze tests were rated as highly efficient in terms of test construction, administration and analysis (Hulstijn 2010). Additionally, Hulstijn claims that the vocabulary test is very reliable while the cloze test ostensibly measures everything from productive vocabulary knowledge, productive and receptive grammar knowledge, orthographic knowledge and knowledge of semantics, pragmatics and discourse. For these reasons, all participants (in the case of the L2 speakers, to ensure near-native proficiency) completed an abbreviated version of the Diploma del Español como Lengua Extranjera (DELE 2002), which is widely used in generative second language acquisition studies of Spanish in North America (e.g. Montrul 2000, 2002, 2005, 2009; White et al. 2004; Cuza & Frank 2011; Leeser et al. 2011; Prada Pérez & Pascual y Cabo 2011, 2012; Pascual y Cabo et al. 2012; Slabakova et al. 2012). The abbreviated version of the DELE is comprised of 50 items divided across two sections: a vocabulary section (n=30) and a cloze section (n=20).

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7 As with any self-reported data, the data regarding how participants felt they learned Spanish and how much they use Spanish on a daily basis, should be taken with a certain level of reservation. However, it is clear that great differences exist regarding the amount of formal instruction about Spanish the native speaker participants and the L2 speakers received. Regarding the percent daily use of Spanish (and not another language), it should be noted that each of the L2 speakers forms part of the workforce, actively participates in religious events in the community, seven of eight have Spanish-speaking children and the majority of their media sources are in Spanish.
<table>
<thead>
<tr>
<th>Participant</th>
<th>Vocabulary</th>
<th>Cloze</th>
<th>Composite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Native</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>29</td>
<td>19</td>
<td>48</td>
</tr>
<tr>
<td>4</td>
<td>30</td>
<td>19</td>
<td>49</td>
</tr>
<tr>
<td>5</td>
<td>29</td>
<td>20</td>
<td>49</td>
</tr>
<tr>
<td>6</td>
<td>30</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>7</td>
<td>30</td>
<td>17</td>
<td>47</td>
</tr>
<tr>
<td>8</td>
<td>30</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>9</td>
<td>28</td>
<td>19</td>
<td>47</td>
</tr>
<tr>
<td>10</td>
<td>30</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>11</td>
<td>30</td>
<td>19</td>
<td>49</td>
</tr>
<tr>
<td>12</td>
<td>30</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>13</td>
<td>30</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>14</td>
<td>30</td>
<td>19</td>
<td>49</td>
</tr>
<tr>
<td>15</td>
<td>30</td>
<td>19</td>
<td>49</td>
</tr>
<tr>
<td>16</td>
<td>30</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>17</td>
<td>30</td>
<td>18</td>
<td>48</td>
</tr>
<tr>
<td>18</td>
<td>29</td>
<td>20</td>
<td>49</td>
</tr>
<tr>
<td>19</td>
<td>30</td>
<td>20</td>
<td>50</td>
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<tr>
<td>20</td>
<td>30</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>21</td>
<td>29</td>
<td>17</td>
<td>46</td>
</tr>
<tr>
<td>22</td>
<td>30</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>23</td>
<td>28</td>
<td>19</td>
<td>47</td>
</tr>
<tr>
<td>24</td>
<td>29</td>
<td>19</td>
<td>48</td>
</tr>
<tr>
<td>25</td>
<td>30</td>
<td>16</td>
<td>46</td>
</tr>
<tr>
<td>26</td>
<td>30</td>
<td>18</td>
<td>48</td>
</tr>
<tr>
<td>Average</td>
<td>29.63</td>
<td>19.08</td>
<td>48.71</td>
</tr>
<tr>
<td>St. Dev.</td>
<td>0.65</td>
<td>1.14</td>
<td>1.33</td>
</tr>
</tbody>
</table>

L2

<table>
<thead>
<tr>
<th>Participant</th>
<th>Vocabulary</th>
<th>Cloze</th>
<th>Composite</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>29</td>
<td>18</td>
<td>47</td>
</tr>
<tr>
<td>2</td>
<td>30</td>
<td>18</td>
<td>48</td>
</tr>
<tr>
<td>3</td>
<td>29</td>
<td>16</td>
<td>45</td>
</tr>
<tr>
<td>4</td>
<td>29</td>
<td>16</td>
<td>45</td>
</tr>
<tr>
<td>5</td>
<td>28</td>
<td>17</td>
<td>45</td>
</tr>
<tr>
<td>6</td>
<td>30</td>
<td>18</td>
<td>48</td>
</tr>
<tr>
<td>7</td>
<td>28</td>
<td>17</td>
<td>45</td>
</tr>
<tr>
<td>8</td>
<td>29</td>
<td>18</td>
<td>47</td>
</tr>
<tr>
<td>Average</td>
<td>29.00</td>
<td>17.25</td>
<td>46.25</td>
</tr>
<tr>
<td>St. Dev.</td>
<td>0.76</td>
<td>0.89</td>
<td>1.39</td>
</tr>
</tbody>
</table>
In Table 4-6 above, the scores of each section as well as the composite score for both participant groups are shown. The average vocabulary and cloze component scores as well as the composite proficiency scores for the L2 speaker participants (29, 17.25 and 46.25, respectively) are similar to those of the native speaker participants (29.63, 19.08 and 48.71, respectively). Additionally, the L2 speaker participants’ vocabulary and cloze component scores fall within the same range as the native speaker participants (28-30 and 16-18, 28-30 and 16-20, respectively). The standard cutoff for near-native proficiency is 45, which all L2 speaker participants meet.

**4.5 Experimental Tasks**

In this section, the experimental tasks are described in detail and examples of all token types are provided. In total, there are five experimental tasks. The three offline tasks were completed in Microsoft Word documents while the two online tasks were completed via E-prime software (Schneider, Eschman & Zuccolotto 2002). The specific tasks, the inclusion of both online and offline versions and the particular properties examined were expressly employed to test the IH’s prediction that the presence of two linguistic systems in bilinguals results in processing differences for certain linguistic properties.

**4.5.1 Offline Experimental Tasks**

In order to capture behavioral data, two offline experimental tasks were completed by both participant groups. Obtaining behavioral (offline) and processing (online) data from the same participant groups is an important aspect of this study in that it makes it possible to test the IH’s claim that bilinguals’ processing may be different. That is, while bilinguals are predicted to differ from monolinguals on online measures according to the IH, convergence on offline measures is not precluded. By using the same experimental stimuli in the offline and online tasks, this claim can be tested.
In total, two offline tasks were completed by both participant groups. Each task was completed in a Microsoft Word document on the same laptop computer on which the online tasks were completed. The offline version of the Grammaticality Judgment/Correction Task is described below in Section 4.5.1.1, followed by the offline version of the Context-Matching Felicitousness Task in Section 4.5.1.2. Examples of all experimental stimuli are provided in each section.

4.5.1.1 Grammaticality Judgment/Correction Task

The GJCT was designed to test for knowledge of the syntactic distribution of overt and null subjects in Spanish. It contained 106 tokens (n=24 subject tokens, n=72 Differential Object Marking tokens\(^8\), n=10 filler tokens; see Appendix A). In this task, participants were informed that they would read short sentences written in a Microsoft Word document. Upon reading each sentence, participants were asked to correct any sentences they deemed as having errors\(^9\). Tokens related to subjects are described in Sections 4.5.2.1.1 and 4.5.2.1.2 below while the filler agreement tokens are described in Section 4.5.2.1.3.

4.5.1.1.1 Referential subject tokens. Of the 24 tokens related to subjects, half were related to referential subjects (n=12) and half were related to expletive subjects (n=12). Of the referential subject tokens, half were designed to test for acceptance of null referential subjects (n=6) and half for overt referential subjects (n=6). As discussed in Section 3.2.1, both null and overt referential subjects are possible in both Farsi and Spanish. Examples (39a) and (39b) below show a null and an overt referential subject token, respectively.

---

\(^8\) The Differential Object Marking (DOM) tokens will not be discussed in the present study.

\(^9\) Participants were instructed to do nothing to sentences they deemed as error-free. Additionally, they were instructed to circle a box containing the phrase Agramatical, no sé corregirla “Ungrammatical, I don’t know how to fix” if they felt the sentence was ungrammatical but were not sure how to make it grammatical.
(39)a. En mi opinión pro siempre\textsuperscript{10} toma muchas vitaminas por la mañana.

  in my opinion pro always take-3.SG.PRES many vitamins for the morning

b. En mi opinión ella toma muchas vitaminas por la mañana.

  in my opinion she take-3.SG.PRES many vitamins for the morning

“In my opinion, she (always) takes a lot of vitamins in the morning.”

Half (n=3) of the overt referential subject tokens contained the third person singular masculine referential subject pronoun (i.e. él “he”) and half (n=3) contained the third person singular feminine referential subject pronoun (i.e. ella “she”). The same three disyllabic verbs were equally distributed across the null and overt referential subject tokens: toma “drinks,” hace “makes” and come “eats.” That is, the verb toma “takes” appeared four times in the Grammaticality Judgment/Correction Task: once with the third person masculine overt referential subject él “he,” once with the third person feminine overt referential subject ella “she”\textsuperscript{11} and twice with null subjects. The verbs were transitive activities, all conjugated for third person singular present tense to control for person and tense variables as per research in the variationist tradition. Barrenechea and Alonso (1977) and Silva-Corvalán (1994) reported that overt subject pronouns were more likely to be used in singular than in plural and a comparison across Quesada and Blackwell (2009) and Blackwell and Quesada (2010) reveals that first person singular was used more frequently in the Mexican speakers studied therein (this was also found in Lapidus Shin (2012) for Mexican children. Silva Corvalán (1982) reported less likelihood of overt subject pronouns with preterite and present tense than with imperfect or

\textsuperscript{10} Unlike the overt referential subject token seen in example (39b), the null subject token seen in example (39a) contains the adverbial \textit{siempre} “always”. The motivation for this difference has its base in the complementary online Grammaticality Task: the overt subject pronoun, verb and direct object serve as the regions of interest examined in the overt tokens, while the adverbial, verb and direct object serve as the regions of interest examined in null tokens.

\textsuperscript{11} Note that neither I nor the IH make predictions with respect to differences between masculine and feminine referential subject pronouns as I am not aware of research that has shown an effect of gender here.
conditional tense and continuity of tense-aspect-mood (TAM) has been shown to favor null subjects (Silva Corvalán 1982, 1994; Otheguy et al. 2007).

4.5.1.1.2 Expletive subject tokens. Of the 12 expletive subject tokens, half were designed to test for acceptance of pro (n=6) and half for rejection of overt subjects (n=6) since, with the exception of some Caribbean dialects (Toribio 2000; Martínez-Sanz 2011), Spanish does not allow for overt expletive subjects (Jaeggli 1982; Rizzi 1982; Picallo 1998). Example (40a) shows a null expletive token while (40b) shows an overt expletive token.

(40)a. Los vecinos dicen que pro siempre llueve mucho en esa región.
the neighbors say-3.PL.PRES that pro always rain-3.SG.PRES mucho in this region
b. *Los vecinos dicen que ello llueve mucho en esa región.
the neighbors say-3.PL.PRES that it rain-3.SG.PRES mucho in this region

"The neighbors say that it (always) rains a lot in this region."

Only three weather verbs were employed in this token type (llueve “rains,” nieva “snows” and llovizna “drizzles”) and they were equally dispersed across the null and overt expletive subject tokens. Therefore, participants saw each verb four times, twice in null subject tokens and twice in overt subject tokens. The ungrammatical subject pronoun ello “it” appeared in all six overt tokens.

4.5.1.1.3 Fillers. Finally, 10 filler tokens were employed to divert the participants’ attention from the actual experimental tokens described above as well as to ensure that they were paying attention to the stimuli. Six of the filler tokens contained subject-verb number agreement errors of the type seen in example (41) below while four contained noun-adjective number agreement errors such as those seen in example (42) below.

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12 Section 3.2.1 discussed one difference between Spanish and Farsi: Farsi optionally permits in “this” in subject position. As Karimi (2005) claims that this is a demonstrative, the Spanish equivalent demonstrative este “this” could be considered a viable candidate for the ungrammatical overt expletive subject. However, este is commonly used as a filler (like “um” in English) in Argentine Spanish and research has shown that hesitations or fillers of this type in speech and in offline tasks affect the learners’ processing and rating of the target sentence. Thus, ello was used.
(41). *Las princesas ricas compró muchas decoraciones de la mueblería. 

“The rich princesses bought many decorations from the furniture shop.”

(42). *Los políticos corrupto aceptaron muchos sobornos la semana pasada. 

“The corrupt politicians accepted a lot of bribes last week.”

Importantly, the offline version of the Grammaticality Judgment/Correction Task was taken after the online version in order to avoid priming effects. The next section describes the second offline task.

4.5.1.2 Context-Matching Felicitousness Task

The second offline task was a CMFT, the goal of which was to test for knowledge of the distribution of overt and null subjects in three discourse-constrained contexts. This task contained 36 tokens (n=12 Contrastive Focus tokens, n=12 Topic Shift tokens, n=12 Topic Maintenance tokens; see Appendix B). Participants were instructed to read short contexts followed by a short sentence, which they were to judge based on the context. Specifically, participants were asked to judge the target sentence based on how well it was expressed on a scale of 1 (100% bien “good”) to 4 (100% mal “bad”). Contrastive Focus tokens are described in Section 4.5.1.2.1, Topic Shift tokens are described in Section 4.5.1.2.2 and Topic Maintenance tokens are described in Section 4.5.1.2.3.

4.5.1.2.1 Contrastive Focus. All Contrastive Focus contexts employed in this study introduced two subjects such that a contrast between them could be made. Each context began with an adverbial time phrase such as Cuando salimos a cenar “When we go out for dinner” and

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13 The use of a reverse scale (where the better linguistic option is scored lower than the inferior options) was an oversight. Future research of the same kind will employ standard scales.
the two subjects employed were always the third person singular feminine DP, such as mi novia “my girlfriend” and the first person singular pronoun yo “I.” Half (n=6) of the Contrastive Focus tokens contained overt subject pronouns as in (43a) while half (n=6) contained null subject pronouns as in example (43b) below. Recall from Section 3.2.2.2 that overt subject pronouns are felicitous in Contrastive Focus contexts, whereas null subject pronouns are infelicitous (but see Amaral Matos & Schwenter 2005).

(43). Cuando salimos a cenar, mi novia prefiere comer platos livianos, pero yo prefiero comer algo sustancioso. “When we go out to eat, my girlfriend prefers to eat light dishes, but I prefer to eat something of substance.”

a. Así que ella come ensaladas y yo como milanesas en los restaurantes.

b. #Así que pro come ensaladas y pro como milanesas en los restaurantes.

“So, she eats salads and I eat breaded meats in restaurants.”

4.5.1.2.2 Topic Shift. All Topic Shift contexts also introduced two subjects such that a shift in reference can be made. The third person singular feminine subject was always introduced in the first sentence of the context. Then, the first person singular subject pronoun was introduced in the second sentence and used in any subsequent sentences. As variationist literature has found a positive correlation for distance since last mention (Cameron 1995; Flores-Ferrán 2002; Cameron & Flores-Ferrán 2004; Travis 2005, 2007), a minimum of three verbs conjugated for first person singular separated the first sentence of the context in which the third person referent was introduced and the target sentence in which it was reintroduced, reinforcing the Topic Shift context. Half (n=6) of the Topic Shift tokens contained overt subject pronouns as in
(44a) while half (n=6) contained null subject pronouns as in example (44b) below. Like Contrastive Focus contexts, overt subject pronouns are preferred in Topic Shift contexts (see Section 3.2.2.2; Bentivolgio 1987; Silva-Corvalán 1994; Cameron 1994, 1995; Flores-Ferrán 2002; Cameron & Flores 2003; Travis 2005, 2007).

(44). Mi hija quiere ser autora y no tiene otros intereses. Yo creo que es mejor tener varios intereses y sugiero otras actividades, pero no importa lo que diga yo. “My daughter wants to be an author and she has no other interests. I think that it is best to have various interests and I suggest other activities, but it doesn’t matter what I say.”

a. Finalmente ella escribe cuentos y pasa todo el día en su cuarto.
   finally she write-3.SG.PRES stories and spend-3.SG.PRES all the day in her bedroom

b. #Finalmente pro escribe cuentos y pro pasa todo el día en su cuarto.
   finally pro write-3.SG.PRES stories and spend-3.SG.PRES all the day in her bedroom

“In the end, she writes stories and she spends the whole day in her room.”

4.5.1.2.3 Topic Maintenance. Differently from the two contexts described above, the Topic Maintenance contexts employed in this task only introduced one third person singular feminine subject. This subject was initially introduced in the first sentence of the context. From there, the context contained a minimum of three verbs conjugated for third person singular with null subjects. Half (n=6) of the Topic Shift tokens contained overt subject pronouns as in (45a) while half (n=6) contained null subject pronouns as in example (45b) below. Recall from Section 3.2.2.2 that overt subject pronouns are less preferred in Topic Maintenance contexts; instead, the null subject pronoun is preferred (Bentivolgio 1987; Silva-Corvalán 1994; Cameron 1994, 1995; Flores-Ferrán 2002; Cameron & Flores 2003; Travis 2005, 2007).

(45). Mi cuñada es muy sociable. Tiene muchos amigos y por eso va a muchas cenas a la canasta donde tiene que contribuir con algo.
“My daughter-in-law is very social. She has a lot of friends and for that reasons, she goes to a lot of potluck dinners where she has to share something.”

a. #Así que ella lleva postres y pro comparte todo con sus amigos.
   So that she take-3.SG.PRES desserts and pro share-3.SG.PRES all with her friends.

b. Así que pro lleva postres y pro comparte todo con sus amigos.
   So that she take-3.SG.PRES desserts and pro share-3.SG.PRES all with her friends.

“So, she takes desserts and shares everything with her friends.”

Importantly, all subjects, matrix clause verbs and DOs were counterbalanced across token type (Contrastive Focus, Topic Shift and Topic Maintenance) and subject type (null or overt) in order for the tokens to be maximally comparable. Twelve matrix clause verbs (come “eat,” hace “make,” prepara “prepare,” toma “drink,” ofrece “offer,” lleva “take,” vende “sell,” escribe “write,” lee “read,” compra “buy,” pinta “paint,” dibuja “draw”) were distributed evenly across the three token types and subject types. All were transitive verbs (and most were activities) and as described above in Section 4.5.2.1.1, tense and person were controlled for. The same is true for the 12 matrix clause DOs (ensaladas “salads,” alfajores “cookies with dulce de leche,” empanadas “savory pastries,” agua “water,” café “coffee,” postres “desserts,” revistas “magazines,” cuentos “stories,” poemas “poems,” esculturas “sculptures,” paisajes “landscapes,” figuras “figures”) employed in the task. The offline version of this task was taken after the online version to avoid priming.

4.5.2 Online Experimental Tasks

In addition to the offline tasks, complementary online tasks were employed in E-prime software (Schneider, Eschman & Zuccolotto 2002) in order to capture RT data for the regions of interest and corresponding spillover regions. This was done to determine if these regions of interest are processed differently (i.e. more slowly) in the L2 speaker group than in the native
speaker group. Specifically, a Self-Paced Reading Task (SPRT; Aaronson & Scarborough 1976; Mitchell & Green 1978) was adopted for both online tasks. In order to mimic normal reading and to measure RT for each designated region of interest, a non-cumulative moving window technique (Just, Woolley & Carpenter 1982) was employed. In this type of display, participants are presented with a blank screen that contained several underscored sentence items whose content only became visible as the participant pressed a button to advance along in the sentence in a region-by-region fashion. This way, participants saw the sentence in a non-cumulative manner (only one region was visible at a time) and in linear fashion (as opposed to the centered technique in which each region is presented in the center of the screen). Example (46) provides a short English example of this technique. Each line below (e.g. (46a), (46b), etc.) represents what the participant would see as they progressed through the sentence, which starts with all regions of the sentence being hidden (as in (46a)) and ends with the final word (as in (46f)), but never seeing more than one region at a time.

(46)a. ___ _____ ___ __ _______
    b. The _____ ___ __ _______
    c. ___ black ___ __ _______
    d. ___ _____ cat __ _______
    e. ___ _____ ___ is _______
    f. ___ _____ ___ __ hungry.

Upon completion of the moving window (i.e. having read the entire sentence in the region by region fashion described above), participants were asked to answer a short meaning-based yes/no comprehension question designed to focus their attention on the content of the experimental stimuli and not the grammaticality/felicitousness of the tokens themselves. Sections 4.5.2.1 and 4.5.2.2 below describe the online version of the Grammaticality Task and the online version of
the Context-Matching Felicitousness Task, respectively, in detail and provide examples of all experimental stimuli.

4.5.2.1 Online Grammaticality Task

Like the offline version, the online GT was designed to test for knowledge of the syntactic distribution of overt and null subjects via RT data. It also contained 106 tokens, 24 of which were subject tokens, 72 of which were DOM tokens\textsuperscript{14} and 10 of which were filler agreement tokens (see Appendix C for examples). In this task, participants were asked to read short sentences via the moving window technique described above in Section 4.5.2 and then answer brief yes/no comprehension questions about each sentence. Comprehension questions were employed to check for understanding of the sentences and mask the purpose of the task. Participants were instructed to read the sentences at a normal rate and respond to the comprehension questions as quickly and as accurately as possible. Prior to the experimental task, participants completed a training session consisting of eight practice tokens, after which they were instructed to clarify any questions they had with the researcher. The actual experiment began with two additional non-experimental tokens, after which the 106 experimental tokens were presented in random fashion in E-prime. Sections 4.5.2.1.1 and 4.5.2.1.2 below describe the subject tokens while Section 4.5.2.1.3 describes the filler agreement tokens.

4.5.2.1.1 Referential subject tokens. The same token distribution described in 4.5.1.1 was employed in the online version. Yet, as this task was designed to measure the RT to specific regions of interest within the sentence, sentences of the same token type were purposefully and consistently divided to allow for statistical comparison of the RTs to each region of interest.

\textsuperscript{14} The 72 experimental tokens examining the distribution of DOM are not discussed herein.
With respect to the regions of interest, referential subject tokens were divided as follows, where the forward slash (/) indicates a division in the presentation of the token in E-prime.

(47)a. En mi opinión/siempre/toma/muchas/vitaminas/por la mañana.
    b. En mi opinión/ella/toma/muchas/vitaminas/por la mañana.
    “In my opinion, she (always) takes a lot of vitamins in the morning.”

That is, in example (47a), the first region seen by participants is en mi opinión “in my opinion,” then siempre “always” and so on. The regions of interest analyzed for RT in referential subject tokens such as example (47a) above are siempre “always,” toma “takes” and the spillover region muchos/muchas “many”. These regions were chosen for analysis since they surround the syntactic position of the verb (between the adverb siempre “always” and the direct object muchas vitaminas “a lot of vitamins”). Since example (47b) contains an overt referential subject, the regions of interest analyzed for RT in these tokens above are ella “she,” toma “takes” and the spillover region muchos/muchas “many.” In all tokens, the regions of interest and the spillover region neither began nor ended the token as those regions may have disproportionate RTs (Just & Carpenter 1980). Additionally, the spillover region was the masculine or feminine plural form of the quantifier mucho “many” (i.e. muchos or muchas, respectively).

4.5.2.1.2 Expletive subject tokens. As with the previous token type, all null and overt expletive subject tokens were purposefully and consistently divided to allow for statistical comparison of the RTs to each region of interest. With respect to the regions of interest, tokens such as (48a) and (48b) above were divided as follows (again, the forward slash (/) indicates a division in the presentation of the token in E-prime).

(48)a. Los vecinos/dicen/que/siempre/llueve/mucho/en esa región.
     “The neighbors say that it (always) rains a lot in this region.”
The regions of interest in expletive subject tokens such as example (48a) above are *siempre* “always,” *llueve* “rains” and the spillover region *mucho* “a lot”. These regions were chosen for analysis since they surround the syntactic position of the weather verb (between the adverb *siempre* “always” and *mucho* “a lot”). Since example (48b) contains an overt expletive subject, the regions of interest analyzed for RT of this token type are *ello* “it,” *llueve* “rains” and the spillover region *mucho* “a lot.”

**4.5.2.1.3 Fillers.** Finally, the same 10 filler tokens from the offline version were employed to divert the participants’ attention from the actual experimental tokens described above. Six contained subject-verb number agreement errors of the type seen in example (49) below, while 4 contained noun-adjective number agreement errors such as those seen in example (50) below.

(49). *Las princesas ricas compró muchas decoraciones de la mueblería.*  
“The rich princesses bought many decorations from the furniture shop.”

(50). *Los políticos corrupto aceptaron muchos sobornos la semana pasada.*  
“The corrupt politicians accepted a lot of bribes last week.”

While the filler tokens will not be examined with respect to RT, they were presented with the same moving window technique and the regions were divided in the same manner. Experimental tokens and filler tokens alike were randomly distributed by E-prime.

**4.5.2.2 Online version of Context-Matching Felicitousness Task**

The final online task was an online version of the CMFT that was designed to test for knowledge of the distribution of overt and null subjects via RT data in three discourse-constrained contexts. This task contained the same 36 contexts employed in the offline version (n=12 Contrastive Focus tokens, n=12 Topic Shift tokens, n=12 Topic Maintenance tokens; see Appendix D). Recall that each context had two possible target sentences. In the case that a
participant saw the overt subject version of the target sentence in the offline task, the same participant saw the null subject version of the target sentence in the online task. In this task, participants were informed that they would read short contexts presented in their entirety followed by a sentence presented via a moving window task (see Section 4.5.2) and then answer a brief yes/no comprehension question about each sentence. They were instructed to read the sentences at a normal rate and respond to the comprehension questions as quickly and as accurately as possible. Participants completed a training session consisting of three practice tokens and then were instructed to clarify any questions they had with the researcher. The actual experiment began with two additional non-experimental tokens, after which all 36 experimental tokens were presented in random fashion in E-prime. Sections 4.5.2.2.1, 4.5.2.2.2 and 4.5.2.2.3 below describe the Contrastive Focus, Topic Shift and Topic Maintenance tokens, respectively.

4.5.2.2.1 Contrastive Focus. The same token distribution described in Section 4.5.2.1 was employed in the online CMFT. The context was seen and read prior to the target sentence. All Contrastive Focus target sentences were purposefully and consistently divided for presentation in E-prime to allow for statistical comparison of the RTs for each region of interest. With respect to the regions of interest, the target sentences were divided as shown in example (51), where the forward slash (/) indicates a division in the presentation of the token in E-prime.

(51)a. Así que/ella/come/ensaladas/y/yo/como/milanesas/en los restaurantes.
   b. #Así que/come/ensaladas/y/como/milanesas/en los restaurantes.
   “So, she eats salads and I eat breaded meats in restaurants.”

The regions of interest to be examined in tokens like (51a) which contain overt subjects are the subject, verb and the DO (the spillover region) of the matrix clause, in this case: ella “she,” come

15 For example, ¿Mi novia come ensaladas? “Does my girlfriend eat salads?”.
“eats,” *ensaladas* “salads.” In examples like (51b), which contain infelicitous null subjects, the regions of interest are *come* “eats,” and *ensaladas* “salads.”

**4.5.2.2.2 Topic Shift.** The Topic Shift tokens were divided in the same manner such that statistical comparisons of the RTs for each region of interest could be performed. Specifically, the target sentences were divided as seen in example (52), where the forward slash (/) indicates a division in the presentation of the token in E-prime. Recall that the context was seen and read prior to seeing the target sentence.

(52)a. Finalmente/ella/escribe/cuentos/y/ella/pasa/todo/el día/en su cuarto.
   b. #Finalmente/escribe/cuentos/y/pasa/todo el día/en su cuarto.
   “In the end, she writes stories and she spends the whole day in her room.”

The regions of interest to be examined in tokens like (52a) which contain overt subjects are the subject, verb and the DO (the spillover region) of the matrix clause, in this case: *ella* “she,” *escribe* “writes” and *cuentos* “stories.” In examples like (52b), which contain infelicitous null subjects, the regions of interest are *escribe* “writes” and *cuentos* “stories.”

**4.5.2.2.3 Topic Maintenance.** Finally, and as with the other context types, all Topic Maintenance tokens were divided as seen in example (53) such that statistical comparisons of the RTs for each region of interest could be conducted.

(53)a. #Así que/ella/lleva/postres/y/comparte/todo/con sus amigos.
   b. Así que/lleva/postres/y/comparte/todo/con sus amigos.
   “So, she takes desserts and shares everything with her friends.”

The regions of interest to be examined in tokens like (53a’) which contain overt subjects are the subject, verb and the DO (the spillover region) of the matrix clause, in this case: *ella* “she,” *lleva* “takes” and *postres* “desserts.” In examples like (53b’), which contain infelicitous null subjects, the regions of interest are *lleva* “takes” and *postres* “desserts.”
As described at the close of Section 4.5.2.2.3, all subjects, matrix clause verbs and DOs were counterbalanced across token type (Contrastive Focus, Topic Shift and Topic Maintenance) and subject type (null or overt) and the online tasks were taken before the offline tasks to avoid priming.

4.6 Conclusion

This chapter presented the methodological design of the study as well as the theoretical claims motivating it. Since the IH maintains that differences in processing are a likely source of non-convergence, especially for external interface-conditioned properties in near-native speakers, both online and offline tasks examining the distribution of overt and null subjects were described. Collecting online and offline data makes it possible to determine if participants perform differently according to the task, which in turn gives insight into their processing abilities as compared to the associated behavioral data collected.
CHAPTER 5
RESULTS

5.1 General Introduction

The goals of this chapter are to present the results of the offline and online experimental tasks described in Chapter 4 and to interpret their respective results. Results for both the native speaker and second language (L2) speaker participant groups are provided, first for the offline experimental tasks and then for the online experimental tasks. For each task, the descriptive results are presented first along with the statistical analysis and, finally, the interpretation of the results. An analysis of how these findings relate to the research questions of this dissertation will be offered in Chapter 6.

5.2 Offline Experimental Results

Two offline experimental tasks that examined participants’ knowledge of the distribution of subjects in Spanish were described in Section 4.5.1: the Grammaticality Judgment/Correction Task and the Context-Matching Felicitousness Task. A brief recap of the purpose of each task, the types of tokens examined and the empirical findings of token type are presented below.

5.2.1 Grammaticality Judgment/Correction Task (GJCT)

As described in Section 4.5.1.1, the goal of the GJCT was to test for knowledge of the syntactic distribution of overt and null subjects across 106 tokens, 24 of which examined the distribution of subjects, 72 of which examined the distribution of Differential Object Marking (DOM) and 10 of which were fillers. Recall that in this task, participants were simply asked to read short sentences written in a Microsoft Word document. Since some of the sentences were
ungrammatical, participants were asked to correct any sentences they deemed as having errors\(^1\). The following sections first discuss the referential and expletive subject tokens.

### 5.2.1.1 Referential subject tokens

The 12 tokens related to referential subjects were designed to test for acceptance of overt and null referential subject tokens (RSO and RSN, respectively) both of which are grammatical in Spanish (see Section 3.2.1). An equal number of tokens for each subject type was employed. Example (39), which is reproduced below as (54), shows an RSN and a RSO token, respectively. Recall that the overt referential subjects were always third person singular (divided equally between masculine él “he” and feminine ella “she”) and that three disyllabic verbs (toma “drinks,” hace “makes” and come “eats”) were distributed across the null and overt referential subject tokens (see Appendix A).

\[(54)a. \text{En mi opinión pro siempre toma muchas vitaminas por la mañana.}\]
\[b. \text{En mi opinión ella toma muchas vitaminas por la mañana.}\]

“In my opinion, she (always) takes a lot of vitamins in the morning.”

Figure 5-1 below shows the group average number of items accepted for both the RSO and RSN tokens. An ungrammatical item was only deemed to be accurately rejected (i.e. not accepted) when the participant made the appropriate correction. All participants accepted 6 of 6 RSO tokens. With the exception of one native speaker participant (19), all native speaker and L2 speaker participants accepted a minimum of 4 of 6 RSN tokens. The average number of RSN tokens accepted by the native speaker group is 5.50 (standard deviation 1.31) while the average number of tokens accepted by the L2 speaker group is 5.75 (standard deviation 0.46). These results are analyzed along with the results for the expletive subject tokens in Section 5.2.1.4.

---

\(^1\) Recall that when the participants deemed the sentence to be error-free, they were instructed to simply continue on with the task. Additionally, participants were instructed to circle a box containing the phrase Agramatical, no sé corregirla “Ungrammatical, I don’t know how to fix” if they felt the sentence was ungrammatical, yet were not sure how to correct it.
5.2.1.2 Expletive subject tokens

The 12 tokens related to expletive subjects were designed to test for acceptance of *pro* \((n=6)\) and for rejection of *ello* \((n=6)\) in expletive subject contexts. Recall from Section 3.2.1 that in Argentine Spanish, *pro* is required in expletive subject contexts. Example (55), reproduced below as (40), shows a null expletive subject token (ESN) and an overt expletive subject token (ESO). Recall that three weather verbs were equally dispersed across the null and overt expletive subject tokens: *llueve* “rains,” *nieva* “snows” and *llovizna* “drizzles.” That is, half \((n=2)\) of the *llueve* “rains” tokens, for example, appeared with a null subject while half \((n=2)\) appeared with the ungrammatical overt subject *ello* “it.”

\[
\begin{align*}
\text{(55)a. Los vecinos dicen que } & \text{pro siempre llueve mucho en esa región.} \\
\text{b. *Los vecinos dicen que } & \text{ello llueve mucho en esa región.} \\
\text{“The neighbors say that } & \text{it (always) rains a lot in this region.”}
\end{align*}
\]

Figure 5-2 below provides the group averages for both the overt and null expletive subject tokens. With the exception of one L2 speaker participant (7), all native speaker and L2
speaker participants accurately rejected all ESO tokens. The average number of overt expletive subject tokens accepted by the native speaker group is 0.00 (standard deviation 0.00) while the L2 speaker group’s average acceptance is 0.13 (standard deviation 0.35). Similarly, with the exception of one L2 speaker participant (2), all native speaker and L2 speaker participants accepted all ESN tokens. The average number of ESN tokens accepted by the native speaker group is 6.00 (standard deviation 0.00) while the average number of tokens accepted by the L2 speaker participant group is 5.88 (standard deviation 0.35)

<table>
<thead>
<tr>
<th></th>
<th>ESO</th>
<th>ESN</th>
</tr>
</thead>
<tbody>
<tr>
<td>NS</td>
<td>0.00</td>
<td>6.00</td>
</tr>
<tr>
<td>L2</td>
<td>0.13</td>
<td>5.88</td>
</tr>
</tbody>
</table>

Figure 5-2. GJCT group results: expletive subject tokens. NS=native speaker; L2=second language speaker; ESO=overt expletive subject; ESN=null expletive subject

5.2.1.3 Statistical analysis and interpretation of results

A Generalized Mixed Models ANOVA with Subject Type (overt or null), Condition Type (referential or expletive) and Group (native speaker or L2 speaker) was conducted. Finding

\footnote{L2 speaker participant P02 changed a grammatical ESN token that read *Mis amigas dicen que ello llueve mucho en la costa* “My friends say that it rains a lot in the coast” to *Mis amigos dicen que hay mucha lluvia en la costa* “My friends say that there is a lot of rain at the coast”, replacing the weather verb *lllover* “to rain” with the existential *hay* “there is”. The change is grammatical but avoids the weather verb. L2 speaker participant P07 failed to correct an ungrammatical token that read *La doctora dice que ello llueve mucho en el verano.*}
a main effect for Subject Type would indicate that overt and null subjects were treated differently. Similarly, finding a main effect for Condition Type would indicate that referential and expletive subjects were treated differently. Finally, finding a main effect for Group would indicate that the native speaker and L2 speaker participants performed differently. Finding an interaction between Subject Type and Condition Type would indicate that overt and null subjects are treated differently in referential and expletive tokens. Finding interactions between Subject Type and Group would indicate that overt and null subjects were treated differently by the two participant groups. Finding interactions between Condition Type and Group would indicate that expletive and referential tokens were treated differently by the participant groups. Finally, finding an interaction between Subject Type, Condition Type and Group would indicate that the native speaker and L2 speaker participants treated overt and null subjects in referential and expletive conditions differently from each other. Bonferroni post-hoc two-way and three-way analyses were also conducted to examine the sources of any interactions that obtained. The alpha level was set at 0.05; thus, \( p \)-values less than 0.05 are reported as statistically significant.\(^3\) The sequential Bonferroni adjusted significance level is 0.05. The analysis revealed a significant main effect for Subject Type (\( F(1,120) \ 71.210, \ p = 0.000 \)) and Condition Type (\( F(1,120) \ 707.017, \ p = 0.000 \)), but not for Group (\( F(1,120) \ 0.097, \ p = 0.766 \)). There was an interaction between Subject Type and Condition Type (\( F(1,120) \ 3,120.097, \ p = 0.000 \)) and an interaction between Subject Type and Group (\( F(1,120) \ 969.897, \ p = 0.000 \), but not between Condition Type and Group (\( F(1,120) \ 0.131, \ p = 0.718 \)). Finally, a three-way interaction between Subject Type, Condition Type and Group was found (\( F(1,120) \ 484.122, \ p = 0.000 \)).

\(^3\) This is true of all analyses conducted herein and will, therefore, not be repeated.
In order to compare the differential treatment between overt and null subjects, a post-hoc pairwise t-tests for independent samples (with Bonferroni adjustment) were conducted across conditions and groups. Native speakers accepted overt and null subjects in referential tokens to the same degree ($p = 0.083$), which is an expected finding since both are grammatical. With respect to expletive tokens, native speakers accepted null subjects significantly more than overt subjects ($p = 0.000$), which is expected since only null expletives are permitted in Argentine Spanish. Like the native speaker group, the L2 speaker group accepted overt and null subjects in referential tokens to the same degree ($p = 0.139$), an expected result as both are grammatical. This is true for both groups despite the difference in categorical acceptance of the RSO tokens and non-categorical acceptance of the RSN tokens (four native speakers participants changed the verbal morphology of the verb and two added a subject; one L2 speaker participant added a subject). This is not problematic, however, as both overt and null referential subjects are permissible in Spanish. The L2 speaker group also accepted null subjects significantly more than overt subjects ($p = 0.000$), which is expected if their grammar does not permit overt expletive subjects.

Regarding the comparison between referential and expletive tokens, the post-hoc pairwise t-tests for independent samples (with Bonferroni adjustment) showed that both the native speaker and L2 speaker groups accepted significantly more RSO tokens than ESO tokens ($p = 0.000$ and $p = 0.000$), which is also expected since overt subjects are grammatical in referential contexts only. In contrast but as expected, both groups accepted referential and expletive tokens with null subjects to the same degree ($p = 0.083$ and $p = 0.559$, respectively).

Finally, with respect to the comparison between the native speaker and L2 speaker groups, the post-hoc pairwise t-tests for independent samples (with Bonferroni adjustment)
showed that the two groups accepted the referential tokens with overt subjects to the same degree ($p = 0.426$). The same is true of the referential tokens with null subjects ($p = 0.588$). Regarding the expletive tokens with overt subjects, both groups accepted the expletive tokens with overt subjects to the same degree ($p = 0.286$). Lastly, both the native speaker and L2 speaker groups accepted the expletive tokens with null subjects to the same degree ($p = 0.329$). All of these results are expected if both groups have converged on the syntactic distribution of subjects in Spanish.

5.2.1.4 Summary of Grammaticality Judgment/Correction Task results

In conclusion, both the native speaker and L2 speaker group showed differential treatment of overt and null subjects in expletive subject contexts, while accepting both subject types in referential subject contexts. The near-rejection of overt expletive subjects and simultaneous near-categorical acceptance of null expletive subjects in Spanish provides evidence of convergence on the Spanish syntax of subjects. Additionally, both groups differentiated between context type in the presence of an overt subject, but not null subjects. Finally, the results described in the preceding paragraph indicate that the L2 speaker group does not differ from the native speaker group with respect to their acceptance of the four token types described in Sections 5.2.1.2 (RSO and RSN) and 5.2.1.3 (ESO and ESN). Perhaps more importantly, both the native speaker and L2 speaker groups made a statistically significant distinction ($p = 0.000$ for both groups) between the ESO and RSO tokens, showing that they reject overt subjects in ungrammatical expletive tokens but accept them in grammatical referential tokens. Taken together, the findings outlined above are in line with theoretical syntactic descriptions (Rizzi 1982; Jaeggli & Hyams 1988) in that overt expletive subjects are not permissible in Spanish, but overt and null referential subjects are.
5.2.2 Context-Matching Felicitousness Task (CMFT)

As described in Section 4.5.2.1, the objective of the second offline task, the CMFT, was to test for knowledge of the discourse distribution of overt and null subjects in three specific contexts: Contrastive Focus, Topic Shift and Topic Maintenance. The 36 tokens were divided evenly across these contexts and an equal number of tokens of each type contained overt subjects (always ella “she”) as compared to null subjects. In a Microsoft Word document, participants read the context and following target sentence, which they judged in light of the context. Specifically, participants were asked to judge the target sentence based on how well it was expressed on a scale of 1 (100% bien “good”) to 4 (100% mal “bad”). Recall from Section 4.5.2.1 that all subjects, matrix clause verbs and direct objects were counterbalanced across the experimental items. Contrastive Focus tokens are discussed first below, then Topic Shift tokens and finally Topic Maintenance tokens.

5.2.2.1 Contrastive Focus tokens

The following paragraphs provide the descriptive results only for Contrastive Focus tokens like example (56); a comprehensive statistical analysis and interpretation of the CMFT is provided in Section 5.2.2.4.

(56). Cuando salimos a cenar, mi novia prefiere comer platos livianos, pero yo prefiero comer algo sustancioso.
“When we go out to eat, my girlfriend prefers to eat light dishes, but I prefer to eat something of substance.”

a. Así que ella come ensaladas y yo como milanesas en los restaurantes.

b. #Así que pro come ensaladas y pro como milanesas en los restaurantes.
“So, she eats salads and I eat breaded meats in restaurants.”

While participants rated the target sentences on a scale of 1 through 4, the data were ultimately collapsed. As a four point scale was provided, gradiency was expected. Yet, as the contingency table below shows, the participants’ ratings largely corresponded to either end of the
scale. That is to say that participants’ favored a rating of 1 (=100% good) or 4 (=100% bad) as opposed to the intermediary ratings of 2 (= more or less good) and 3 (=more or less bad).

<table>
<thead>
<tr>
<th>Rating</th>
<th>1 = 100% good</th>
<th>2 = more or less good</th>
<th>3 = more or less bad</th>
<th>4 = 100% bad</th>
</tr>
</thead>
<tbody>
<tr>
<td>NS</td>
<td>60.4%</td>
<td>9.4%</td>
<td>9.6%</td>
<td>2.6%</td>
</tr>
<tr>
<td>L2</td>
<td>70.5%</td>
<td>6.3%</td>
<td>10.1%</td>
<td>13.2%</td>
</tr>
</tbody>
</table>

Based on this finding, ratings of 1 and 2 have been combined as “good” and ratings of 3 and 4 have been combined as “bad” for all token types. The following graphs and the statistical analyses performed below will be based on this binary distinction.

Figure 5-3 below provides the group average number of “good” ratings for the overt and null subject Contrastive Focus tokens (CFO and CFN, respectively) using the binary distinction described above. The average number of CFO tokens rated as “good” was quite high for both the native speaker and L2 speaker groups (5.92 and 5.75 out of 6, respectively). Additionally, there was minimal variation regarding the number of CFO tokens rated as “good” by both groups. All but two participants in the native speaker group and two in the L2 speaker group rated all six CFO as “good.” These participants (10 and 23 and 7 and 8, respectively) rated 5 of 6 as “good.” The standard deviation for the native speaker group was 0.28 and that of the L2 speaker group was 0.46. In contrast, the number of CFN tokens rated as “good” was rather low for both the native speaker group and the L2 speaker group: 0.71 and 0.25, respectively. The L2 speaker group showed very little variation (only participants 2 and 6 rated 1 of the 6 tokens as “good” and the standard deviation was 0.46); however, the native speaker group demonstrated more variation with two participants rating 1 of 6 tokens as “good” (4 and 16), one participant rating 2 of 6 tokens as “good” (12), three participants rating 3 of 6 tokens as “good” (8, 10 and 13) and one participant rating 4 of 6 tokens as “good” (9). The native speaker group standard deviation
was 1.27. Despite the variation seen in the native speaker group, all participants rated more CFO tokens as “good” than CFN tokens. The same is true for the L2 speaker group. These results are analyzed and interpreted in Section 5.2.2.4.

![Graph showing group average number of "good" ratings for CFO and CFN tokens.

<table>
<thead>
<tr>
<th>Group</th>
<th>CFO Rating</th>
<th>CFN Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>NS</td>
<td>5.92</td>
<td>0.71</td>
</tr>
<tr>
<td>L2</td>
<td>5.75</td>
<td>0.25</td>
</tr>
</tbody>
</table>

Figure 5-3. CMFT group results: Contrastive Focus. CFO=Contrastive Focus token with overt subject; CFN=Contrastive Focus token with null subject

5.2.2.2 Topic Shift tokens

Descriptive results for Topic Shift tokens like (57) are provided below, while a comprehensive statistical analysis and interpretation of the results is found in Section 5.2.2.4.

(57). Mi hija quiere ser autora y no tiene otros intereses. Yo creo que es mejor tener varios intereses y sugiero otras actividades, pero no importa lo que diga yo. “My daughter wants to be an author and she has no other interests. I think that it is best to have various interests and I suggest other activities, but it doesn’t matter what I say.”

a. Finalmente ella escribe cuentos y ella pasa todo el día en su cuarto.
b. #Finalmente escribe cuentos y pasa todo el día en su cuarto.
“In the end, she writes stories and she spends the whole day in her room.”

Figure 5-4 below provides the group average number of “good” ratings for the Topic Shift tokens. The average number of TSO tokens rated as “good” was quite high for both the native speaker and L2 speaker groups (5.54 and 5.75 out of 6, respectively). For the L2 speaker
group, there was very minimal variation; with the exception of one participant who rated 4 of 6 TSO tokens as “good,” all other L2 speakers rated 6 of 6 as “good.” The standard deviation was 0.71. While the majority of the native speaker participants rated 6 of 6 TSO tokens as “good,” six rated 5 of 6 as “good” (7, 9, 13, 15, 16 and 22), one rated 4 of 6 as “good” (8) and one rated 3 of 6 as “good” (3). The standard deviation for the native speaker group was 0.78. A higher proportion of TSN tokens was rated as “good” across the native speaker and L2 speaker groups than was evidenced for the Contrastive Focus contexts. Specifically, the native speaker group average number of TSN tokens rated as “good” was 2.75 and the L2 speaker group average was even higher at 4.38. More variation in the number of tokens rated as “good” was seen across both participants groups, with the native speaker group’s range spanning 0-6 and the L2 speaker group’s range spanning 1-6. The standard deviations of each group are 1.70 and 1.51, respectively. In spite of the variation, all but one native speaker participant (8) and two L2 speaker participants (4 and 8) rated more TSO tokens as “good” than TSN tokens.

Figure 5-4. CMFT group results: Topic Shift. TSO=Topic Shift token with overt subject; TSN=Topic Shift token with null subject
5.2.2.3 Topic Maintenance tokens

The descriptive results for Topic Maintenance tokens like example (58) are presented below. The statistical analysis and interpretation of these tokens, along with Contrastive Focus and Topic Shift tokens, is provided in Section 5.2.2.4.

(58). Mi cuñada es muy sociable. Tiene muchos amigos y por eso va a muchas cenas a la canasta donde tiene que contribuir con algo.
“My daughter-in-law is very social. She has a lot of friends and for that reasons, she goes to a lot of potluck dinners where she has to share something.”

a. #Así que ella lleva postres y comparte todo con sus amigos.
b. Así que lleva postres y comparte todo con sus amigos.
“So, she takes desserts and shares everything with her friends.”

Table 5-5 below provides the group average number of good ratings for the Topic Maintenance tokens. Perhaps unexpectedly, the average number of TMO rated as “good” was rather high for both the native speaker and L2 speaker groups (4.58 and 5.50 out of 6, respectively). For the L2 speaker group, there was little variation; with the exception of one participant who rated 4 of 6 TMO tokens as “good” (1) and two participants who rated 5 out of 6 as “good” (2 and 6), all other L2 speakers rated 6 of 6 as “good.” The standard deviation was 0.76. The native speaker participants showed slightly more variation with a range of 0-6 TMO tokens rated as “good” and a standard deviation of 1.61. Regarding the TMN tokens, both the native speaker and L2 speaker groups’ average rating was quite high: 5.54 and 6.00, respectively. Less variation, as compared to the TMO tokens, was evidenced for each group; the native speaker group range of average number of TMN tokens rated as “good” spanned from 3-6 (standard deviation 0.88) while no variation was evidenced for the L2 speaker group. Based on this information, it is not surprising that fewer participants demonstrated the expected differential rating between TMO and TMN tokens. In fact, only 11 of 24 native speaker participants and 3 of 8 L2 speakers did so. Of the 13 native speaker participants that did not make the expected
distinction, 11 rated an equal number of TMO and TMN tokens as “good” (3, 9, 10, 11, 13, 14, 
16, 18, 23, 24 and 25) and two rated more TMO than TMN tokens as “good” (15 and 19). The 
five L2 speakers that did not make the expected distinction (3, 4, 5, 7 and 8) all rated an equal 
number of TMO and TMN tokens as “good.”

<table>
<thead>
<tr>
<th>Group</th>
<th>#TMO</th>
<th>TMN</th>
</tr>
</thead>
<tbody>
<tr>
<td>NS</td>
<td>4.58</td>
<td>5.54</td>
</tr>
<tr>
<td>L2</td>
<td>5.50</td>
<td>6.00</td>
</tr>
</tbody>
</table>

Figure 5-5. CMFT group results: Topic Maintenance. TMO=Topic Maintenance token with 
over subject; TMN=Topic Maintenance token with null subject

5.2.2.4 Statistical analysis and interpretation of results

As with the GJCT, a Generalized Mixed Models ANOVA was conducted for the CMFT. 
Subject Type (overt or null), Context Type (Contrastive Focus, Topic Shift and Topic 
Maintenance) and Group (native speaker or L2 speaker) constituted the factors. Finding a main 
effect for Subject Type would indicate that overt and null subjects were treated differently. 
Similarly, finding a main effect for Context Type would indicate that Contrastive Focus, Topic 
Shift and Topic Maintenance contexts were treated differently. Finally, finding a main effect for 
Group would indicate that the native speaker and L2 speaker participants performed differently. 
Finding an interaction between Subject Type and Context Type would indicate that overt and 
null subjects are treated differently in the different contexts. Finding interactions between
Subject Type and Group would indicate that overt and null subjects were treated differently by the two participant groups. Finding interactions between Context Type and Group would indicate that Contrastive Focus, Topic Shift and Topic Maintenance tokens were treated differently by the participant groups. Finally, finding an interaction between Subject Type, Context Type and Group would indicate that the native speaker and L2 speaker participants treated overt and null subjects in Contrastive Focus, Topic Shift and Topic Maintenance contexts differently from each other. Bonferroni post-hoc two-way and three-way analyses were also conducted to examine the sources of any interactions found. The analysis revealed a significant main effect for Subject Type (F(1, 1,140) 5.397, p = 0.020), Context Type (F(2, 1,140) 89.487, p = 0.000) and Group (F(1,25) 37.641, p = 0.000). Additionally, interactions were found between Subject Type and Context Type (F(2, 1,140) 181.232, p = 0.000), Subject Type and Group (F(1, 1,140) 35.774, p = 0.000) and Context Type and Group (F(2, 1,140) 58.946, p = 0.000). Lastly, a three-way interaction between Subject Type, Context Type and Group was found (F(2, 1,140) 32.776, p = 0.000).

With respect to the Subject Type and Context Type interaction, the post-hoc pairwise t-tests for independent samples (with Bonferroni adjustment) showed that the native speaker group rated significantly more CFO tokens as “good” as compared to CFN tokens (p = 0.000). The native speaker also group rated significantly more TSO tokens than TSN tokens as “good” (p = 0.000) while simultaneously rating significantly more TMN tokens as “good” than TMO tokens (p = 0.012). Regarding the L2 speaker group, they too rated significantly more CFO than CFN tokens as “good” (p = 0.000). The same result obtained for the Topic Shift contexts in that significantly more TSO tokens were rated as “good” as compared to TSN tokens (p = 0.000). Lastly, significantly more TMN tokens were rated as “good” than TMO tokens (p = 0.044). All
of these results are expected since overt subjects are preferred in Contrastive Focus and Topic Shift contexts, while null subjects are preferred in Topic Maintenance contexts.

For the Subject Type and Group interaction, the post-hoc pairwise t-tests for independent samples (with Bonferroni adjustment) showed that the native speaker group rated significantly more CFO tokens as “good” than TSO tokens ($p = 0.031$). The same is true of when comparing CFO tokens and TMO tokens ($p = 0.001$). The native speaker group also rated significantly more TSO tokens than TMO tokens ($p = 0.014$). These results are not surprising as the preference for overt subjects is preferred in both Contrastive Focus and Topic Shift contexts, although less categorical in Topic Shift (Silva-Corvalán 1982, 1994; Enríquez 1984; Bentivolgio 1987; Bayley & Pease-Álvarez 1996, 1997; Otheguy et al. 2007; Prada Pérez 2009; Lapidus & Shin 2012), hence the significant difference between the CFO and TSO tokens and the CFN and TSN tokens.

Regarding the null subject tokens, the native speaker group rated significantly less CFN tokens as “good” as compared to TSN tokens ($p = 0.000$). Similarly, significantly less CFN tokens were rated as “good” as compared to TMN tokens ($p = 0.0000$). Lastly, significantly less TSN tokens were rated as “good” when compared to TMN tokens ($p = 0.000$). Again, these results are expected as only in Topic Maintenance contexts are null subjects preferred. The L2 speaker group, however, rated CFO and TSO tokens similarly ($p = 1.000$), which is does not indicate divergence as both Contrastive Focus and Topic Shift contexts prefer overt subjects. A difference was expected, yet did not obtain, for the CFO versus TMO tokens ($p = 1.000$) and the TSO versus TMO tokens ($p = 1.000$). These results are unexpected in that no difference in rating was seen between the Contrastive Focus or Topic Shift tokens as compared to the Topic Maintenance tokens. With respect to the null subject tokens, the L2 group rated significantly less CFN tokens as “good” as compared to TSN tokens ($p = 0.000$). The same result obtained for the CFN versus
TMN comparison ($p = 0.000$). Finally, the L2 speaker group rated significantly less TSN tokens as “good” as compared to TMN tokens ($p = 0.002$). Here, the expected results obtained, matching the native speaker group.

Regarding the Context Type and Group interaction, the post-hoc pairwise t-tests for independent samples (with Bonferroni adjustment) showed that the native speaker and L2 speaker groups rated CFO tokens to the same degree ($p = 0.312$). The same is true of the CFN tokens ($p = 0.148$). These findings are expected if both participant groups have converged on the distribution of subject pronouns in Contrastive Focus contexts in Spanish. With respect to the Topic Shift tokens, the native speaker and L2 speaker groups rated TSO tokens to the same degree ($p = 0.492$); however the L2 group rated the TSN tokens significantly better than the native speaker group ($p = 0.011$). Here, the L2 speaker group is showing more optionality, accepting more null subject pronouns in Topic Shift contexts. Previous child and adult research supports this finding (Sorace 2000, 2003; Tsimpli et al. 2004; Prada Pérez 2009; Rothman 2009; Lapidus Shin & Cairns 2012). Finally, the L2 speaker group rated significantly more TMO and TMN tokens as “good” than the native speaker group ($p = 0.037$ and $p = 0.009$, respectively), which is unexpected if the participant groups have converged on the distribution of subject pronouns in Topic Maintenance contexts.

**5.2.2.5 Summary of Context-Matching Felicitousness Task results**

To summarize, the results described above point to several similarities between the native speaker and L2 speaker groups. First, both the native speaker and the L2 speaker group showed differential treatment of overt versus null subjects within each context. Second, the native speaker and the L2 speaker group showed the same distinctions in ratings for the null subject tokens in that less CFN tokens than TSN and TMN tokens were rated as “good” and less TSN tokens than TMN tokens were rated as “good”. However, one important difference did obtain:
the native speaker group rated significantly more CFO than TSO tokens as “good”, more CFO than TMO tokens as “good” and more TSO than TMO tokens as “good”, but this same result did not obtain for the L2 speaker group as they rated these three token types similarly. Finally, recall that the three-way interaction described above showed no statistically significant differences between the native speaker and L2 speaker groups for the CFO tokens nor for the CFN tokens, thus demonstrating that the L2 speaker group performs native-like for the Contrastive Focus tokens. Concerning the Topic Shift tokens, both the native speaker and L2 speaker group’s average number of “good” ratings of overt subject tokens was high, while their average number of “good” ratings for TSN tokens for each group was somewhat lower. The same three-way interaction revealed no statistically significant difference between the native speaker and L2 speaker group for TSO tokens; nevertheless, a significant difference was found for the TSN tokens, suggesting that the L2 group does not make an entirely native-like distinction for Topic Shift tokens in the CMFT. Finally, with respect to the average number of “good” ratings for overt subjects in Topic Maintenance contexts, the native speaker group’s average was higher than in previous contexts. Since null subjects are preferred in Topic Maintenance contexts, these numbers are higher than expected. Nevertheless, both the native speaker and L2 speaker group average number of “good” ratings are significantly higher for the null subject tokens than the overt subject tokens. However, the three-way interaction revealed statistically significant differences between the native speaker and L2 speaker group for both TMO and TMN tokens, which is likely due to the L2 speaker group’s higher ratings for both overt and null subject tokens. Although a significant difference obtained between the native speaker and L2 speaker group, this finding is not entirely problematic for the claims made herein since Topic Maintenance contexts prefer null subjects. That is, since the null subject is the default subject
that is employed when an overt subject is not required for contrast or reference to a previously mentioned topic, an overt subject pronoun in a Topic Maintenance context is perhaps less infelicitous than the opposite scenario (i.e. when a null subject is used in lieu of an overt subject in Contrastive Focus or Topic Shift contexts). Specifically, since overt subjects are required to mark contrastive focus or to refer to a distinct yet known (within the common ground) antecedent, we should not expect to see similar rating of overt and null subjects in Contrastive Focus or Topic Shift contexts. This is in fact what the data show: the ratings of both the native speaker and L2 speaker group are more polarized with regard to Contrastive Focus and Topic Shift contexts as compared to Topic Maintenance contexts. Additionally, in spite of the apparent mixed results (i.e. the L2 speakers showing native-like convergence on only half of the tokens), the Subject Type and Context Type comparison demonstrated that both the native speaker and L2 speaker groups made a distinction between overt and null subjects in all context types, thus establishing their differential treatment of overt subjects as compared to null subjects according to the discourse context. As a whole, these results support prior studies’ findings in that Contrastive Focus contexts were seen to be largely unproblematic even at the advanced proficiency level in Rothman (2009) while Sorace and colleagues found difficulties with Topic Shift contexts.

5.2.3 Summary of Offline Experimental Results

Having described the results of the GJCT and the CMFT, this section brings together the findings of these two tasks. The GJCT tested for knowledge of the syntactic distribution of overt and null subject pronouns in Spanish. Regarding both referential and expletive subjects, the results showed that the L2 speaker group performed as the native speaker group in that they rejected ungrammatical overt expletive subjects but accepted grammatical overt and null referential subjects and null expletive subjects. Importantly, both groups distinguished between
ungrammatical ESO and grammatical RSO tokens. Thus, it seems that the L2 speakers have converged upon the syntactic distribution of subjects in Spanish, including the presence of the null expletive, which Karimi (2005) argues is not permitted in Farsi. This is consistent with the IH’s predictions. The second task, the CMFT, tested for knowledge of the discourse distribution of subjects in Spanish in three contexts: Contrastive Focus, Topic Shift and Topic Maintenance. While some quantitative differences were found between the native and L2 speaker groups, it is important to note that both groups distinguished between the counterbalanced tokens (e.g. CFO versus CFN) showing that their ratings were dependent upon both the context type (Contrastive Focus, Topic Shift or Topic Maintenance) and the subject type (overt versus null). Taken together, the results of the offline experimental tasks provide some evidence of the L2 speaker group’s native-like knowledge of the distribution of overt and null subjects in Spanish. However, since these results come from offline methodology, they might be viewed as compatible with the claims of the Interface Hypothesis (IH) (whether convergence or divergence is found).

Additionally, the differences found between the native speaker and L2 speaker group for TSN, TMO and TMN tokens are also predicted by the IH. The following section examines the processing of the distribution of overt and null subjects in two online tasks, as this is precisely where the IH predicts that measurable differences between native speakers and near-native L2 speakers on external-interface conditioned properties will obtain.

### 5.3 Online Experimental Results

Recall from Section 4.5.2 that two complementary online experimental tasks were completed by the participants in order to examine their processing of the syntactic and discourse distribution of subjects in Spanish: a Grammaticality Task and the online Context-Matching Felicitousness Task. The experiments were presented using E-prime software (Schneider et al. 2002) in order to gather reaction time (RT) data for the regions of interest, where slower RTs are
expected when participants detect ungrammaticality or infelicitousness. A brief recap of the purpose of each task, the token types examined and the descriptive results for each token type are presented below in Sections 5.3.1 and 5.3.2.

5.3.1 Online Grammaticality Task (GT)

As outlined in Section 4.5.2.1, the purpose of the online GT was to test for knowledge of the syntactic distribution of overt and null subjects via RT data. Like the offline version, the GT contained 106 tokens, 24 of which examined the distribution of subjects, 72 of which examined the distribution of DOM\(^4\) and 10 of which were fillers. Recall that in the online version of this task, which was a Self-Paced Reading Task (SPRT), participants were simply asked to read short sentences presented to them via a non-cumulative moving window technique (Just, Woolley & Carpenter 1982) (see Section 4.5.2 for details) and then answer a yes/no comprehension question. The following section provides a macro-analysis of the results of the online GT, while Sections 5.3.1.2 and 5.3.1.3 discuss the results specific to referential and expletive subject tokens.

5.3.1.1 Macro-analysis of the online GT

Just as in the offline tasks, a Generalized Mixed Models ANOVA was conducted for each region of interest in the online tasks. For the online GT, Subject Type (overt or null), Condition Type (expletive or referential) and Group (native speaker or L2 speaker) constituted the factors. Finding a main effect for Subject Type would indicate that overt and null subjects were treated differently. Similarly, finding a main effect for Condition Type would indicate that referential and expletive subjects were treated differently. Finally, finding a main effect for Group would indicate that the native speaker and L2 speaker participants performed differently. Finding an

\(^4\) As stated in Footnote 1, the 72 tokens examining the distribution of DOM are not discussed herein.
interaction between Subject Type and Condition Type would indicate that overt and null subjects are treated differently in referential and expletive tokens. Finding interactions between Subject Type and Group would indicate that overt and null subjects were treated differently by the two participant groups. Finding interactions between Condition Type and Group would indicate that expletive and referential tokens were treated differently by the participant groups. Finally, finding an interaction between Subject Type, Condition Type and Group would indicate that the native speaker and L2 speaker participants treated overt and null subjects in referential and expletive conditions differently from each other. Bonferroni post-hoc two-way and three-way analyses were also conducted to examine the sources of any interactions that obtained.

For the first region of interest, which was comprised of either the overt subject *ella/él/ello* “she/he/it” or the adverb *siempre* “always,” main effects were found for Subject Type (F(1, 17) 4.484, \( p = 0.049 \)) and Group (F(1, 12) 9.831, \( p = 0.008 \)), but not for Condition Type (F(1, 23) 2.549, \( p = 0.124 \)). No interactions were found between Subject Type and Condition Type (F(1, 54) 0.353, \( p = 0.555 \)), Condition Type and Group (F(1, 23) 0.008, \( p = 0.928 \)), Subject Type and Group (F(1, 17) 1.394, \( p = 0.254 \)) or between Subject Type, Condition Type and Group (F(1, 54) 0.025, \( p = 0.874 \)). For the second region of interest, which was the verb, main effects were found for Condition Type (F(1,15) 24.645, \( p = 0.000 \)) and Group (F(1,17) 9.027, \( p = 0.008 \)), but not for Subject Type (F(1, 20) 3.981, \( p = 0.060 \)). No interactions were found between Subject Type and Condition Type (F(1, 40) 0.867, \( p = 0.357 \)), Condition Type and Group (F(1, 15) 3.040, \( p = 0.102 \)), Subject Type and Group (F(1, 20) 0.413, \( p = 0.528 \)) or between Subject Type, Condition Type and Group (F(1, 40) 2.238, \( p = 0.142 \)). Finally, for the last region of interest, which was comprised of either the quantifier *muchos/muchas* “many” or the adverb *mucho* “a lot,” a main effect was found for Group (F(1, 7) 17.134, \( p = 0.004 \)), but not for Subject Type.
(F(1, 13) 2.015, p = 0.179) nor for Condition Type (F(1, 9) 0.764, p = 0.404). An interaction was found between Subject Type and Condition Type only (F(1, 13) 14.422, p = 0.002). No interactions were found between Condition Type and Group (F(1, 9) 0.322, p = 0.584), Subject Type and Group (F(1, 13) 1.438, p = 0.252) or between Subject Type, Condition Type and Group (F(1, 13) 0.593, p = 0.456). The corresponding post-hoc analyses are presented below in the statistical analysis of referential and expletive subject tokens after each region of interest, respectively.

5.3.1.2 Referential subject tokens

The 12 tokens related to referential subjects were of two types: overt referential subject tokens (RSO; n=6) and null referential subject tokens (RSN; n=6). As reviewed in Section 3.2.1, both null and overt referential subjects are permissible in Spanish. Example (39), reproduced below as (59), shows an RSN and RSO token, respectively, with the divisions between regions of interest indicated by forward slashes (/).

(59)a. En mi opinión/siempre/toma/muchas/vitaminas/por la mañana.
   b. En mi opinión/ella/toma/muchas/vitaminas/por la mañana.
   “In my opinion, she (always) takes a lot of vitamins in the morning.”

To allow for statistical comparison of the RTs to each region of interest, the regions of interest within sentences of the same token type were consistently divided in the manner seen in (59). The regions of interest analyzed for RT in null referential subject tokens such as example (59a) above are the adverb siemøpre “always,” the verb toma “takes” and the spillover region muchas “many”. As previously explained, these regions were chosen for analysis since they surround the syntactic position of the verb (between the adverb siem\u00f8pre “always” and the quantifier muchas “many”). Since example (59b) contains an overt referential subject, the regions of interest analyzed for RT in these tokens are the subject ella “she,” the verb toma
“takes” and the spillover region *muchas* “many.” Appendix C provides the full list of tokens for the online GT. The following subsections provide the descriptive results, statistical analysis and interpretation for all three regions of interest.

### 5.3.1.2.1 Descriptive and statistical analyses

This section provides descriptive and statistical analyses of the RT data for the RSO and RSN tokens. Before beginning, the manner in which the RT data was treated must be explained. First, all RTs corresponding to missed comprehension questions (i.e. incorrect responses to the yes/no comprehension questions that followed the tokens) were excluded from the analysis. Secondly, the RT data was trimmed by excluding all RTs slower than 2 seconds\(^5\). Additionally, the mean RT and standard deviation for each region of interest were calculated across the task. All RTs higher than 2 standard deviations from the mean RT were replaced with the cutoff value \((x = \text{mean } RT + (\text{standard deviation } \times 2))\)\(^6\). Figures and statistical analyses are provided according to the region of interest. To begin, Figure 5-6 provides a visual representation of the group average RT for the native speaker and L2 speaker groups for the first region of interest, which for the RSO tokens was the subject *ella/el* “she/he” while for the RSN token it was the adverb *siempre* “always.” For the RSO tokens, the average RT for the native speaker group for the first region of interest, *ella/el* “she,” was 507.12ms while that of the L2 speaker group was 577.39ms. The native speaker range was \(381.17-679.50\)ms with a standard deviation of 96.72ms. The L2 speaker range was a bit higher at \(471.60-749.80\)ms with a standard deviation of 88.68ms. Regarding the RSN tokens, the average RT for the native speaker group for the first region of interest, the adverb *siempre* “always,” was 516.52 while that of the L2 speaker group was 622.14ms. The native speaker range was 326.80-

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\(^5\) These data were excluded on the grounds that it is likely that such high RTs represent external distractions (e.g. asking the researcher a question, pausing to look up, a loud noise).

\(^6\) See Hopp (2007, p. 224) and Leeser et al. (2011) for similar treatment of data.
692.17ms with a standard deviation of 100.51ms. The L2 speaker range was higher at 523.40-772.67ms with a standard deviation of 102.10ms. Individual RTs and standard deviations for all GT tokens are found in Appendix F. From Figure 5-7, it is clear that the native speaker group average RT for the RSO and RSN tokens is faster than that of the L2 speaker group.

![Figure 5-6. Online GT group results: referential subject tokens for first region (ella/él/siempre).](image)

NS=native speaker; L2=second language speaker; RSO=overt referential subject; RSN=null referential subject

To compare the treatment of overt and null subjects, a post-hoc pairwise t-tests for independent samples (with Bonferroni adjustment) were conducted across conditions and groups. The results showed that the native speaker group’s average RT to RSO and RSN tokens did not differ for the first region of interest ($p = 0.668$). The same finding obtained for the L2 group in that their average RT to RSO and RSN tokens did not differ significantly ($p = 0.331$). These results are expected since both token types are grammatical.

With respect to the comparison between the native speaker and L2 speaker groups, the post-hoc pairwise t-tests for independent samples (with Bonferroni adjustment) showed that the
two groups’ RTs to the RSO tokens did not differ \((p = 0.065)\). However, for the RSN tokens, the native speaker group RT was significantly faster than that of the L2 speaker group \((p = 0.012)\).\(^7\)

Next, Figure 5-7 below provides a visual representation of the group average RT for the native speaker and L2 speaker groups for the second region of interest, the verb. Regarding the RSO tokens, the average RT for the native speaker group was 464.48ms while that of the L2 speaker group was 575.98ms. The native speaker group range spanned from 307.67-796.00ms with a standard deviation of 114.18ms. Here again, the L2 speaker group range was a bit higher at 379.40-888.60ms with a standard deviation of 167.97ms. With respect to the RSN tokens, the average RT for the native speaker group was 463.52ms while that of the L2 speaker group was 497.74.

![Figure 5-7. Online GT group results: referential subject tokens for second region (verb).](image)

<table>
<thead>
<tr>
<th>Subject Type</th>
<th>Condition Type</th>
<th>Group</th>
<th>Average RT (milliseconds)</th>
<th>Range (milliseconds)</th>
<th>Standard Deviation (milliseconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RSO</td>
<td>Referential</td>
<td>NS</td>
<td>464.48</td>
<td>307.67-796.00</td>
<td>114.18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>L2</td>
<td>575.98</td>
<td>379.40-888.60</td>
<td>167.97</td>
</tr>
<tr>
<td>RSN</td>
<td>Expletive</td>
<td>NS</td>
<td>463.52</td>
<td>307.67-796.00</td>
<td>114.18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>L2</td>
<td>497.74</td>
<td>379.40-888.60</td>
<td>167.97</td>
</tr>
</tbody>
</table>

\(^7\) Recall that three statistical comparisons were conducted and described in the offline tasks: Subject Type (overt versus null), Condition Type (referential versus expletive) and Group (native speaker versus L2 speaker). This was possible as just one set of comparisons between the participants’ acceptance or rejection of the tokens was made in the offline task. Three sets of comparisons are necessary for the online task since three regions of interest were examined. Therefore, the second comparison (referential versus expletive) will be presented for all three regions of interest in Section 5.3.1.4.
The native speaker group range was 212.75-754.20ms with a standard deviation of 117.45ms. The L2 speaker range (364.00-628.83ms) fell within that of the native speaker range and the standard deviation was lower (96.18ms). As was seen for the first region of interest, the native speaker group average RT to the RSO tokens and RSN tokens alike (although to a lesser extent in the latter case) is faster than that of the L2 speaker group.

To compare the treatment of overt and null subjects, a post-hoc pairwise t-tests for independent samples (with Bonferroni adjustment) were conducted across conditions and groups. The results showed that the native speaker group’s average RT to RSO and RSN tokens did not differ for the second of interest \( (p = 0.951) \). The same result obtained for the L2 group; their average RT to RSO and RSN tokens did not differ significantly \( (p = 0.158) \). Again, these results are expected since both are token types grammatical.

With respect to the comparison between the native speaker and L2 speaker groups, the post-hoc pairwise t-tests for independent samples (with Bonferroni adjustment) showed that the two groups’ RTs did not differ for the RSO tokens \( (p = 0.069) \) or for the RSN tokens \( (p = 0.411) \).

Finally, Figure 5-8 provides a visual representation of the group average RT for the native speaker and L2 speaker groups for the third region of interest, the quantifier *muchos/muchas* “many.” The native speaker group average for the RSO tokens was 514.50ms while that of the L2 speaker group was 575.98ms. The range of the native speaker group was 335.33-819.00ms with a standard deviation of 102.32ms. Here, the range of the L2 speaker group (456.00-699.00ms; 78.55ms range) fell within that of the native speaker group. Regarding the RSN tokens, the native speaker group average was 481.69ms while that of the L2 speaker group was 632.63ms. The native speaker group range was 314.33-643.60ms with a standard deviation of 94.96ms. The range of the L2 speaker group was higher (437.33-864.00ms) with a
standard deviation of 148.04ms. Here again, the native speaker group average RT for the RSO and RSN tokens is faster than that of the L2 speaker group.

![Graph showing Group Average Reaction Time for RSO and RSN tokens]

Figure 5-8. Online GT group results: referential subject tokens for third region (muchos/muchas). NS=native speaker; L2=second language speaker; RSO=overt referential subject; RSN=null referential subject

The same comparison of the treatment of overt and null subjects was conducted via a post-hoc pairwise t-tests for independent samples (with Bonferroni adjustment) analysis across conditions and groups. It was found that neither the native speaker group’s average RT to RSO and RSN tokens nor that of the L2 speaker group differed for the third of interest (\( p = 0.396 \) and \( p = 0.179 \), respectively). These results are expected since both are token types grammatical.

For the comparison between groups, the post-hoc pairwise t-tests for independent samples (with Bonferroni adjustment) showed that the two groups’ RTs differed significantly for both RSO tokens (\( p = 0.009 \)) and for RSN tokens (\( p = 0.011 \)). The following section provides and interpretation of the results found for all three regions of interest.

**5.3.1.2.2 Interpretation of results.** The first comparison made for the three regions of interest examined each participant group’s RT to RSO tokens as compared to RSN tokens.
Across all three regions of interest, neither the native speaker nor the L2 speaker group’s RTs to RSO versus RSN tokens differed significantly. This is the expected result as both tokens are grammatical and indicates that both groups have converged on the syntactic distribution of overt and null referential subject pronouns in Spanish. Lastly, when the native speaker RT was compared to the L2 speaker RT, statistically significant differences obtained between the two groups for RSO tokens in the third region of interest and RSN tokens in the first and third regions of interest. However no statistically significant difference in RT was found between the two groups for the second region of interest. These results are attributable to the L2 speaker group’s slower RTs to all regions of interest in the referential tokens (sometimes by as much as 150ms as in the spillover region for RSN tokens). Importantly, these differences do not indicate lack of convergence on the target grammar, but rather slower overall RTs. The following section reviews the expletive subject tokens.

5.3.1.3 Expletive subject tokens

The 12 expletive subject tokens consisted of two types: overt expletive subjects (ESO; n=6) and null expletive subjects (ESN; n=6). As discussed in Section 3.2.1, Argentine Spanish requires null expletive subjects; overt expletive subjects are ungrammatical. Example (60) below shows this distinction. As with the referential subject tokens, divisions between regions of interest are indicated by forward slashes (/).

(60)a. Los vecinos/dicen/que/siempre/llueve/mucho/en esa región.
   “The neighbors say that it (always) rains a lot in this region.”

The regions of interest analyzed for RT in null expletive subject tokens such as example (60a) above are the adverb siempre “always,” the verb llueve “rains” and the spillover region mucho “a lot”. These specific regions were chosen for analysis since they surround the syntactic position of
the verb (between the adverb *siempre* “always” and the adverb *mucho* “a lot”). Since example (60b) contains an overt expletive subject, the regions of interest analyzed for RT of this token type are the expletive subject *ello* “it,” the verb *llueve* “rains” and the spillover region *mucho* “a lot.” The following subsections provide the descriptive results, statistical analysis and interpretation.

**5.3.1.3.1 Descriptive and statistical analyses.** Like Section 5.3.1.2.1, this section provides a description and a statistical analysis of the RT data for the ESO and the ESN tokens. The data were treated as described in Section 5.3.1.2.1. Figures and statistical analyses are provided according to the region of interest. Thus, Figure 5-9 provides a visual representation of the group average RT for the native speaker and L2 speaker groups for the first region of interest, which for the ESO tokens was the subject *ello* “it” while for the ESN tokens was the adverb *siempre* “always.” With respect to the ESO tokens, the average RT for the native speaker group was 469.88ms while that of the L2 speaker group was 538.69ms. The native speaker range was 318.83-777.75ms with a standard deviation of 104.79ms. The L2 speaker range fell within the native speaker range at 416.60-662.60ms with a standard deviation of 89.17. For the ESN tokens, the average RT for the native speaker group was 492.31ms while that of the L2 speaker group was 606.02ms. The native speaker range was 230.00-730.00ms with a standard deviation of 130.56ms. The L2 speaker range was a bit higher at 434.33-790.50ms, but their standard deviation (131.04ms) was almost identical to that of the native speaker group. As is seen in Figure 5-9, the native speaker group average RT for the ESO and ESN tokens is faster than that of the L2 speaker group.
In order to compare the treatment of overt and null subjects, a post-hoc pairwise t-test for independent samples (with Bonferroni adjustment) was conducted across conditions and groups. The results indicated that the native speaker group’s average RT to ESO and ESN tokens did not differ for the first region of interest \( (p = 0.165) \), which is expected since both are grammatical. The same result obtained for the L2 speaker group’s average RT to ESO and ESN tokens in that no significant difference was found between them in the first region of interest \( (p = 0.084) \). These results are not unexpected as the ungrammaticality of the ESO token may not yet be detected by either group.

Regarding the comparison between the native speaker and L2 speaker groups in the first region of interest, the post-hoc pairwise t-tests for independent samples (with Bonferroni adjustment) showed that the two groups’ RTs to the ESO tokens did not differ \( (p = 0.075) \). However, the native speaker group RT to the ESN tokens was significantly faster than that of the L2 speaker group \( (p = 0.029) \).
Figure 5-10 below provides a visual representation of the group average RT for the native speaker and L2 speaker groups. For the ESO tokens, the native speaker group average RT was 592.67ms while that of the L2 speaker group was 762.26ms. The native speaker range spanned from 278.67-1000.60ms with a standard deviation of 189.08ms. The L2 speaker group range (486.33-956.33ms) fell within that of the native speaker group and their standard deviation was quite similar (182.82ms). Regarding the ESN tokens, the native speaker group average RT was 521.87ms while that of the L2 speaker group was 700.18ms. The native speaker range spanned from 304.00-811.33ms with a standard deviation of 139.72ms. The L2 speaker group range (466.33-985.60ms) was higher than that of the native speaker group but their standard deviation was similar (157.58ms). From Figure 5-10, it is clear that the native speaker group average RT for the ESO and ESN tokens alike is faster than that of the L2 speaker group.

![Graph showing group average reaction time for ESO and ESN tokens](image)

**Figure 5-10.** Online GT group results: expletive subject tokens for second region (verb).

<table>
<thead>
<tr>
<th></th>
<th>ESO</th>
<th>ESN</th>
</tr>
</thead>
<tbody>
<tr>
<td>NS</td>
<td>592.67</td>
<td>521.87</td>
</tr>
<tr>
<td>L2</td>
<td>762.26</td>
<td>700.18</td>
</tr>
</tbody>
</table>

To compare the treatment of overt and null subjects, a post-hoc pairwise t-test for independent samples (with Bonferroni adjustment) was conducted across conditions and groups.
For the second region of interest, the results indicated that the native speaker group’s average RT to ESO and ESN tokens differed ($p = 0.031$), which is expected since only ESN tokens are grammatical. However, this result did not obtain for the L2 speaker group. Their average RT to ESO and ESN tokens showed no significant difference ($p = 0.288$), which is unexpected since ESO tokens are ungrammatical and should therefore elicit slower RTs.

For the comparison between groups, the post-hoc pairwise t-tests for independent samples (with Bonferroni adjustment) showed that the two groups’ RTs to both the ESO tokens and ESN tokens differed ($p = 0.025$ and $p = 0.004$, respectively).

Lastly, Figure 5-11 provides a visual representation of the group average RT for the native speaker and L2 speaker groups for the final region of interest. For the ESO tokens, the native speaker group average RT was 540.54ms while that of the L2 speaker group was 641.28ms. The range of the native speaker group was 361.00-932.75ms with a standard deviation of 151.03ms. Here again, the L2 speaker group range (499.20-704.33ms) fell within that of the native speaker group and their standard deviation was substantially lower at 61.16ms. Finally, the native speaker group average RT for the ESN tokens was 467.39ms while that of the L2 speaker group was 573.82ms. The range of the native speaker group for the spillover region was 320.17-690.25ms with a standard deviation of 90.29ms. Differently from the previous two regions, the L2 speaker group range (447.50-690.17ms) fell within that of the native speaker group and their standard deviation was lower at 68.46ms. As seen in all previous regions, the native speaker group average RT for the ESO and ESN tokens is faster than that of the L2 speaker group.
Figure 5-11. Online GT group results: expletive subject tokens for third region (*mucho*).

<table>
<thead>
<tr>
<th>Group</th>
<th>ESO</th>
<th>ESN</th>
</tr>
</thead>
<tbody>
<tr>
<td>NS</td>
<td>540.54</td>
<td>467.39</td>
</tr>
<tr>
<td>L2</td>
<td>641.28</td>
<td>573.82</td>
</tr>
</tbody>
</table>

The same post-hoc pairwise t-test for independent samples (with Bonferroni adjustment) was conducted across conditions and groups for the third region of interest. The results showed that the native speaker group’s average RT to ESO and ESN tokens differed ($p = 0.007$), which is expected since only ESN tokens grammatical. The same result obtained for the L2 speaker group in that their average RT to ESO and ESN tokens was significantly different as well ($p = 0.000$). Thus, in the third region, both participant groups demonstrated the expected differentiation between overt and null subjects in expletive tokens.

As in the previous region of interest, the comparison between groups, the post-hoc pairwise t-tests for independent samples (with Bonferroni adjustment) showed that the two groups’ RTs to both the ESO tokens and ESN tokens differed ($p = 0.026$ and $p = 0.016$, respectively) in the third region of interest.

**5.3.1.3.2 Interpretation of results.** The first of two comparisons made for the three regions of interest examined each participant group’s RT to ESO tokens as compared to ESN
tokens. The fact that neither the native speaker nor the L2 speaker group’s RT to the ungrammatical ESO tokens differed significantly from their RTs to the grammatical ESN tokens indicates that they did not detect the ungrammaticality of the former token type in the first region of interest. This is not necessarily unexpected since, at this point in the sentence, they have not yet seen the verb. Without knowing what follows (a weather verb), the overt ello “it” may not be detected as ungrammatical yet. With respect to the second region of interest, the native speaker group, but not the L2 speaker group, showed a significantly slower RT to the ungrammatical ESO tokens as compared to the ESN tokens. In the case of the native speaker group, this is expected as only the ESN tokens are grammatical; thus, this indicates that the native speakers detect the ungrammaticality in the second region. In the final region, both participant groups showed significantly slower RTs to the ungrammatical ESO tokens, indicating that the ungrammaticality is detected by both groups. Lastly, when the native speaker RT was compared to the L2 speaker RT across all three regions of interest, statistically significant differences obtained in five of the six comparisons: ESN tokens in the first region of interest, ESO and ESN tokens in the second and third regions of interest. No statistically significant difference in RT was found between the two groups for the ESO tokens in the first region of interest. These differences are likely a product of the L2 speaker group’s overall slower RT and do not indicate lack of convergence on the target grammar. After all, they notice the ungrammaticality of the ESO tokens. The following section examines the second comparison made in the offline tasks, that of Condition Type.

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8 At this point in the sentence, participants have seen a matrix clause subject (los vecinos), a matrix clause verb (dicen), the complementizer que and ello. The sentence could be felicitously completed as follows:

(i) Los vecinos dicen que ello implica muchos cambios en el vecindario.  
The neighbors say-3.PL.PRES that/this imply-3.SG.PRES many changes in the neighborhood  
“The neighbors say that that implies many changes in the neighborhood.”
5.3.1.4 Condition Type comparison (referential versus expletive)

This section presents the second comparison between referential and expletive tokens described in Footnote 7 above. The results for each region of interest are presented, beginning with the first. The post-hoc pairwise t-test for independent samples (with Bonferroni adjustment) showed that native speaker group’s RT to the grammatical RSO tokens did not differ significantly from that of the RT to the ungrammatical ESO tokens \((p = 0.071)\). The same result obtained for the L2 speaker group \((p = 0.427)\). These results are expected since it was shown in Section 5.3.1.3 above that neither group detected the ungrammaticality of the ESO token in the first region of interest. Regarding the RSN versus ESN comparison, neither the native speaker group’s nor the L2 speaker group’s RT differed significantly \((p = 0.202 \text{ and } p = 0.668, \text{ respectively})\). This is expected, as no difference between these two grammatical tokens is necessarily expected.

For the second region of interest, the post-hoc pairwise t-test for independent samples (with Bonferroni adjustment) showed that native speaker group’s RT to the grammatical RSO tokens was significantly faster than that of their RT to the ungrammatical ESO tokens \((p = 0.000)\). The same is true of the L2 speaker group \((p = 0.010)\). These findings are expected if the participant groups detect the ungrammaticality of the ESO tokens in the second region. With respect to the RSN versus ESN comparison, both the native speaker and L2 speaker group’s RT to the RSN tokens was significantly faster than their RTs to the ESN tokens \((p = 0.007 \text{ and } p = 0.002, \text{ respectively})\). Since both tokens are grammatical, this finding is not necessarily expected.

Finally, for the third region of interest, the post-hoc pairwise t-test for independent samples (with Bonferroni adjustment) revealed that both the native speaker group RT and the L2 speaker group RT to the RSO tokens is significantly faster than their respective RTs to the ESO tokens \((p = 0.005 \text{ and } p = 0.015, \text{ respectively})\). This is expected since only the RSO tokens are
grammatical. For the RSN versus ESN comparison, neither group was shown to have significantly different RTs ($p = 0.269$ and $p = 0.343$, respectively). This is expected as both token types are grammatical.

5.3.1.5 Comparative analysis of RTs

The analyses described in Sections 5.3.1.2.1 and 5.3.1.3.1 did not consider the differential RTs between the tokens; therefore, they do not inform us if the two participant groups are different with respect to the ungrammaticality of the ESO tokens (as evidenced by comparatively slower RTs). As such, a comparison between the RTs to grammatical tokens and those of ungrammatical tokens must be performed. Recall that out of the four token types examined in both the offline and online versions of the grammaticality task, three are grammatical (RSO, RSN and ESN) while one is ungrammatical (ESO) in Spanish. As a consequence, two necessary comparisons will be made, first between overt and null expletive subjects and then between overt expletive subjects and overt referential subjects. Since two comparisons are made from within the same data set, a Bonferroni correction was applied, effectively lowering the original $p$-value of 0.05 to 0.025. In both comparisons made below, slower RTs are expected for the overt expletive subjects since this is the ungrammatical token type. As in Sections 5.3.1.2.1 and 5.3.1.3.1, the comparison will be made for all three regions of interest, starting with the subject region (either ella/él “she/he” or ello “it”), followed by the verb and then the spillover region (either muchos/muchas “many” or mucho “a lot”).

Figure 5-12 below shows the average differential RT for the first region of interest for the two comparisons described above: overt expletive subjects (ESO) versus null expletive subjects (ESN) and overt expletive subjects (ESO) versus overt referential subjects (RSO). The average differential RT was calculated by subtracting the group average RT to the grammatical token
type (in this case, ESN and RSO) from the group average RT to the ungrammatical token type (in both cases ESO).

Figure 5-12. Online GT comparative group results for first region (subject/adverb). NS=native speaker; L2=second language speaker; ESO-ESN=group average RT to ESO tokens minus group average RT to ESN tokens; ESO-RSO=group average RT to ESO tokens minus group average RT to RSO tokens

From Figure 5-12 above, it is clear that the equations outlined above resulted in a negative differential RT for both the native speaker group and the L2 speaker group for the first region of interest. The native speaker group difference in average RT for the ESO-ESN tokens was less than that of the L2 speaker group: -22.43ms versus -67.33ms, respectively. For the ESO-RSO comparison, the differential RT of each group was nearly identical: -37.24ms for the native speaker group and -38.69ms for the L2 speaker group. The fact that the results are negative indicates that, on average, the effect of detecting ungrammaticality (i.e. slower RTs) is not evidenced in the first region of interest. If it were, we would expect the result to be positive since in both equations the first element, ESO, would demonstrate a comparatively slower RT than that of the second element, either ESN or RSO. This finding is not unexpected, however,
since without knowing what the following element of the sentence is, no syntactic crash occurs. That is, until the participants see the verb that follows the ungrammatical overt expletive subject *ello* “it,” the ungrammaticality of the sentence is not evident. The independent samples t-tests showed no statistically significant difference in average differential RT between the two groups for either the ESO-ESN counterbalance (t(30) = 1.254, \( p = 0.220 \)) or for the ESO-RSO counterbalance (t(30) = 0.032, \( p = 0.975 \)). This shows that the L2 speaker group’s performance matched that of the native speaker group.

Figure 5-13 examines the differential RT to the second region of interest, the verb. As shown, the native speaker group average differential RT for the ESO-ESN tokens was slightly greater than that of the L2 speaker group: 70.80ms versus 62.09ms, respectively. However, with respect to the group average differential in RT for the ESO-RSO tokens, the native speaker group average differential RT was less than that of the L2 speaker group: 128.19ms versus 186.28ms, respectively.

![Graph showing differential RT comparison between NS and L2, ESO-ESN, and ESO-RSO](image)

**Figure 5-13.** Online GT comparative group results for second region (verb). NS=native speaker; L2=second language speaker; ESO-ESN=group average RT to ESO tokens minus group average RT to ESN tokens; ESO-RSO=group average RT to ESO tokens minus group average RT to RSO tokens
Different from the first region of interest, the results for the second region were positive which indicates that the participants have detected the ungrammaticality (i.e. they have slower RTs for the ungrammatical tokens than they do for the grammatical tokens). The independent samples t-tests revealed no statistically significant difference in average differential RT between the two groups for either the ESO-ESN counterbalance \((t(30) = 0.132, p = 0.896)\) or for the ESO-RSO counterbalance \((t(30) = -0.901, p = 0.375)\), thus suggesting that the distinction the L2 speaker group makes between the ungrammatical and grammatical tokens matched that of the native speaker group.

Figure 5-14 below shows the average differential RT to the third and final region of interest, the spillover region \((muchos/muchas “many” or mucho “a lot”)\). As is seen, the native speaker and L2 speaker group average differential RT for the ESO-ESN and ESO-RSO tokens was remarkably similar. The native speaker group difference in average RT for the ESO-ESN tokens was 73.15ms while that of the L2 speaker group was 67.46ms.

Figure 5-14. Online GT comparative group results for third region \((muchos/muchas “many” or mucho “a lot”)\). NS=native speaker; L2=second language speaker; ESO-ESN=group average RT to ESO tokens minus group average RT to ESN tokens; ESO-RSO=group average RT to ESO tokens minus group average RT to RSO tokens
Regarding the group average differential RT for the ESO-RSO tokens, the native speaker group average RT was 71.76ms while that of the L2 speaker group is 71.04ms. As with the second region, the results for the third region are positive. This indicates that the participants have detected the ungrammaticality. The independent samples t-tests revealed no statistically significant difference for either the ESO-ESN counterbalance \((t(30) = 0.458, p = 0.650)\) or for the ESO-RSO counterbalance \((t(30) = -0.314, p = 0.756)\). This finding suggests that the distinctions the two participant groups make between the ungrammatical and grammatical tokens are equal.

5.3.1.6 **Summary of online GT results**

Sections 5.3.1.2 through 5.3.1.5 above examined the RT data to three regions of interest (the subject/adverb, the verb and the spillover region) for overt referential subject (RSO) tokens, null referential subject (RSN) tokens, overt expletive subject (ESO) tokens and null expletive subject (ESN) tokens. Regarding the referential tokens, both participant groups demonstrated knowledge of the grammatical nature of both RSO and RSN tokens in all regions of interest in that their RTs to the RSO and RSN tokens did not differ statistically. With respect to the expletive tokens, both the native speaker and L2 speaker groups showed significantly different RTs to the ungrammatical ESO tokens as compared to the grammatical ESN tokens in the third region, indicating their knowledge of the ungrammaticality of the overt subject in an expletive context. However, the native speaker group also showed this distinction in the second region of interest thus revealing that their detection of the ungrammaticality is more spread out. Regarding the comparison between Condition Type, the L2 speaker group demonstrated significantly different RTs to the counterbalances in the same regions as the native speaker group: ESO versus RSO and ESN versus RSN tokens in the second region of interest and ESO versus RSO tokens in the third region of interest. This highlights the native-like performance of the L2 speaker group.
The third comparison made examined the RTs of the native speaker group versus those of the L2 speaker group. While the L2 speaker group was found to have significantly slower RTs for the RSN and ESN tokens in the first region of interest, the ESO and ESN tokens in the second region of interest and the RSO, RSN, ESO and ESN tokens in the third region of interest, recall that the comparative analysis of average differential RTs conducted in Section 5.3.1.5 showed no statistically significant differences between the two participant groups. This ultimately establishes the native-like distinction made between ungrammatical ESO tokens and grammatical ESN and RSO tokens (via comparison of RTs) on the part of the L2 speaker group.

5.3.2 Online Context-Matching Felicitousness Task (CMFT)

As outlined in Section 4.5.2., the purpose of the online CMFT was to test for knowledge of the discourse distribution of overt and null subjects via RT data. Like the offline version, the online CMFT contained 36 tokens, 12 of which pertained to Contrastive Focus contexts, 12 to Topic Shift contexts and 12 Topic Maintenance contexts. Recall that the online version of the CMFT was a Self-Paced Reading Task (SPRT) in which participants read short contexts (presented in their entirety) followed by a target sentence presented via a moving window task (see Section 4.5.2). The target sentence was followed by yes/no comprehension question. The subsequent sections discuss the descriptive results, statistical analyses and interpretation of the results for all three token types.

5.3.2.1 Macro-analysis of the online CMFT

As with the GT, a Generalized Mixed Models ANOVA was conducted for the online CMFT. Subject Type⁹ (overt or null), Context Type (Contrastive Focus, Topic Shift and Topic Maintenance), and Group (native speaker or L2 speaker) were the factors. As in the offline

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⁹ Subject Type is not a factor for the first region of interest since only overt subjects were analyzed. Therefore, the first region of interest has two factors, Token Type and Group.
CMFT, finding a main effect for Subject Type would indicate that overt and null subjects were treated differently by the participants. Similarly, finding a main effect for Context Type would indicate that Contrastive Focus, Topic Shift and Topic Maintenance contexts were treated differently. Finally, finding a main effect for Group would indicate that the native speaker and L2 speaker participants performed differently across the task. Finding an interaction between Subject Type and Context Type would indicate that overt and null subjects are treated differently in the different contexts. Finding interactions between Subject Type and Group would indicate that overt and null subjects were treated differently by the two participant groups. Finding interactions between Context Type and Group would indicate that Contrastive Focus, Topic Shift and Topic Maintenance tokens were treated differently by the participant groups. Lastly, finding an interaction between Subject Type, Context Type and Group would indicate that the native speaker and L2 speaker participants treated overt and null subjects in Contrastive Focus, Topic Shift and Topic Maintenance contexts differently from each other. Bonferroni post-hoc two-way and three-way analyses were also conducted to examine the sources of any interactions found.

As first mentioned in Footnote 7, the analysis for the first region of interest, which is the overt subject *ella* “she”, has two factors only: Context Type and Group. Main effects were found for Context Type (F(2, 6) 10.257, p = 0.010) and Group (F(1,18) 63.805, p = 0.000). No interaction was found between Context Type and Group (F(2, 6) 1.029, p = 0.410). For the second region of interest, which was the verb, a main effect was found for Group (F(1,29) 67.546, p= 0.000), but none were found for Subject Type (F(1, 7) 0.731, p = 0.422) or for Context Type (F(2, 36) 0.813, p = 0.451). No interactions were found between Subject Type and Context Type (F(2, 10) 0.444, p = 0.654), Subject Type and Group (F(1, 7) 0.128, p = 0.731), Context Type and Group (F(2, 36) 0.652, p = 0.527) or between Subject Type, Context Type and Group (F(2, 10) 0.003, p =
0.997). With respect to the final region of interest, the DO, no main effects were found for 
Subject Type (F(1, 0) 0.964, \( p = 0.771 \)), Context Type (F(2, 2) 5.909, \( p = 0.139 \)) or Group (F(1, 
1) 38.143, \( p = 0.192 \)). Neither were interactions found between Subject Type and Context Type 
(F(2, 180) 1.040, \( p = 0.356 \)), Subject Type and Group (F(1, 0) 3.942, \( p = 0.689 \)), Context Type 
and Group (F(2, 2) 4.009, \( p = 0.193 \)), or between Subject Type, Context Type and Group (F(2, 
180) 2.149, \( p = 0.120 \)). The corresponding post-hoc analyses are presented below in the 
statistical analysis of Contrastive Focus, Topic Shift and Topic Maintenance tokens for each 
region of interest.

5.3.2.2 Contrastive Focus tokens

Of the 12 tokens related to Contrastive Focus contexts, half of the target sentences 
contained overt subject pronouns while half contained null subject pronouns. Recall from 
Section 3.2.2.2 that overt subjects are felicitous in Contrastive Focus contexts while null subjects 
are infelicitous. Example (43), reproduced below as (61), first provides a Contrastive Focus 
context which is then followed by an overt and null subject target sentence, respectively. Here 
again, the forward slashes (/) indicate the divisions between the regions of interest.

(61). Cuando salimos a cenar, mi novia prefiere comer platos livianos, pero yo prefiero 
comer algo sustancioso.
“When we go out to eat, my girlfriend prefers to eat light dishes, but I prefer to eat 
something of substance.”

b. #Así que/come/ensaladas/y/como/milanesas/en los restaurantes.
“So, she eats salads and I eat breaded meats in restaurants.”

To allow for statistical comparison of the RTs for each region of interest, all regions of 
interest were consistently divided as is seen in example (61) above. The regions of interest 
analyzed in the following sections for Contrastive Focus tokens with overt subjects such as 
example (61a) above are the subject ella “she,” the verb come “eats,” and the spillover region
ensaladas “salads.” In examples like (61b), which contains a null subject, the regions of interest are the verb come “eats” and the spillover region ensaladas “salads.” Importantly, none of these regions began or ended the target sentence. Additionally, the overt referential subjects were always third person singular feminine (ella “she”) and the same 12 disyllabic verbs (come “eat,” hace “make,” prepara “prepare,” toma “drink,” ofrece “offer,” lleva “take,” vende “sell,” escribe “write,” lee “read,” compra “buy,” pinta “paint” and dibuja “draw”) employed in the offline CMFT were distributed evenly across the overt and null subject tokens. The same is true of the 12 spillover region DOs (ensaladas “salads,” alfajores “cookies with dulce de leche,” empanadas “savory pastries,” agua “water,” café “coffee,” postres “desserts,” revistas “magazines,” cuentos “stories,” poemas “poems,” esculturas “sculptures,” paisajes “landscapes,” figuras “figures”). These methodological points apply to all three token types (Contrastive Focus, Topic Shift and Topic Maintenance) and will not be repeated below. The descriptive and statistical analyses are provided below along with a description.

5.3.2.2.1 Descriptive and statistical analyses. This section provides a statistical analysis of the RT data for the Contrastive Focus with overt subject (CFO) tokens and the Contrastive Focus with null subject (CFN) tokens. The data were treated in the same way as described in Section 5.3.1.2.1. That is, all RTs corresponding to missed comprehension questions (i.e. incorrect responses to the yes/no comprehension questions that followed the target sentences) were excluded from the analysis. Next, the RT data was trimmed by excluding all RTs slower than 2 seconds. Finally, the mean RT and standard deviation for each region of interest were calculated across the task. All RTs higher than 2 standard deviations from the mean RT were replaced with the cutoff value ($x = \text{mean RT} + (\text{standard deviation} \times 2)$). As in the online GT, figures and statistical analyses are provided according to the region of interest. Thus, Figure 5-15
below provides a visual representation of the group average RT for the native speaker and L2 speaker groups for the first region of interest, which for the CFO tokens was the subject *ella* “she.” Here, the native speaker range was 205.50-409.60ms with a standard deviation of 51.20ms. The L2 speaker range was higher at 327.67-564.17ms with a standard deviation of 80.30ms.

![Graph showing group average RT for the native speaker and L2 speaker groups.](image)

**Figure 5-15.** Online CMFT group results: Contrastive Focus tokens for first region (*ella* “she”).

NS=native speaker; L2=second language speaker; CFO=Contrastive Focus with overt subject

To compare the two group’s RT to the CFO tokens in the first region, a post-hoc pairwise *t*-test for independent samples (with Bonferroni adjustment) was conducted across contexts and groups. The result of this analysis showed that the native speaker group’s average RT was significantly faster than that of the L2 speaker group’s for (*p* = 0.001).\(^{10}\)

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\(^{10}\) In the offline version of the Context-Matching Felicitousness Task, three statistical comparisons were conducted and described: Subject Type (overt versus null), Context Type (Contrastive Focus versus Topic Shift versus Topic Maintenance) and Group (native speaker versus L2 speaker). This was possible as just one set of comparisons between the participants’ rating of the tokens was made in the offline task. Three sets of comparisons are necessary for the online task since three regions of interest were examined. Therefore, the second comparison (Contrastive Focus versus Topic Shift versus Topic Maintenance) will be presented for all three regions of interest in Section 5.3.2.5.
Next, Figure 5-16 provides a shows the group average RT for the native speaker and L2 speaker groups for the second region of interest, the verb. For this region, the average RT for the CFO tokens for the native speaker group was 319.82ms while that of the L2 speaker group was 521.718ms. The native speaker range spanned from 190.60-502.50ms with a standard deviation of 68.66ms. Here again, the L2 speaker range was higher at 389.67-618.17ms with a standard deviation of 92.88ms. Regarding the CFN tokens, the average RT for the native speaker group was 307.88ms while that of the L2 speaker group was substantially higher at 517.33ms. The native speaker range for the first region of interest was 190.50-398.40ms with a standard deviation of 51.70ms. The L2 speaker range was higher at 464.00-661.80ms with a standard deviation of 87.56ms.

<table>
<thead>
<tr>
<th></th>
<th>CFO</th>
<th>CFN</th>
</tr>
</thead>
<tbody>
<tr>
<td>NS</td>
<td>319.82</td>
<td>307.88</td>
</tr>
<tr>
<td>L2</td>
<td>521.71</td>
<td>517.33</td>
</tr>
</tbody>
</table>

Figure 5-16. Online CMFT group results: Contrastive Focus tokens for second region (verb). NS=native speaker; L2=second language speaker; CFO=Contrastive Focus with overt subject; CFN=Contrastive Focus with null subject

With respect to the Subject Type and Context Type interaction in the second region of interest, the post-hoc pairwise t-test for independent samples (with Bonferroni adjustment) showed that the native speaker group’s average RT to CFO tokens and CFN tokens was not significantly
different ($p = 0.236$). No significant difference was found between the RTs to the CFO tokens and the CFN tokens for the L2 speakers ($p = 0.914$). Both of these findings are unexpected if the participants have detected the infelicitousness of the CFN tokens.

Regarding the Group comparison, the native speaker group average RT was found to be significantly faster than that of the L2 speaker group for CFO tokens in the second region ($p = 0.000$). The same result was found for the CFN tokens ($p = 0.000$).

Lastly, Figure 5-17 provides a visual representation of the group average RT for the native speaker and L2 speaker groups for the third region of interest, the direct object (DO). With respect to the spillover region, the average RT for the native speaker group was 354.39ms while that of the L2 speaker group was again higher at 792.78ms. The native speaker group range was 196.67-493.50ms with a standard deviation of 85.99ms. The L2 speaker range was again higher at 511.60-1171.00ms and the standard deviation was 219.62ms. For the TSN tokens, the native speaker group average was 374.63ms while that of the L2 speaker group was 726.68ms. The range of the native speaker group was 245.00-530.33ms with a standard deviation of 81.58ms. The range of the L2 speaker group (557.75-969.40ms) and their standard deviation was 158.17ms.

For the Subject Type and Context Type interaction in the third region of interest, the post-hoc pairwise t-test for independent samples (with Bonferroni adjustment) showed that the native speaker group’s average RT to CFO tokens and CFN tokens was not significantly different ($p = 0.081$). The same finding obtained for the L2 speaker group in that no significant difference was found between the RTs to the CFO versus CFN tokens ($p = 0.575$). Again, these results are unexpected if the participants have detected the infelicitousness of the CFN tokens.
Figure 5-17. Online CMFT group results: Contrastive Focus tokens for third region (DO).

NS=native speaker; L2=second language speaker; CFO=Contrastive Focus with overt subject; CFN=Contrastive Focus with null subject

Regarding the Group comparison, no significant difference in RT was found between the native speaker group average RT and that of the L2 speaker group for CFO tokens ($p = 0.143$). The same was found for the CFN tokens ($p = 0.299$). Section 5.3.2.2.2 below provides an interpretation of the results found for Contrastive Focus tokens for all three regions of interest.

5.3.2.2.2 Interpretation of results. Regarding the comparison between overt and null subjects in Contrastive Focus contexts, neither the native speaker nor L2 speaker group showed significantly slower RTs to the infelicitous CFN tokens in either the second or third region of interest. This is an unexpected finding and may be interpreted as neither group distinguishing between CFO and CFN tokens. Additionally, it may indicate that the task was unsuccessful at measuring the participants’ detection of infelicity. Still, it must be emphasized that the L2 speaker group performed as the native speaker group. With respect to the comparison between the two participant groups, and as discussed in Section 5.3.2.2.1, the native speaker group average RT to the three regions of interest for both CFO and CFN tokens was faster than that of
the L2 speaker group. For the first region of interest, the Bonferroni post-hoc tests revealed a statistically significant difference between the native speaker and L2 speaker groups with respect to their RTs to CFO tokens, which can only be a product of the slower overall RT of the L2 group since no other factors were present in the analysis of this region. Regarding the second region of interest, statistically significant differences were found between the two groups for the CFO and CFN tokens, which again are likely due to the overall slower RT of the L2 group as compared to the native speaker group. Differently from the two previous regions, no statistically significant differences were found between the native speaker and L2 speaker group for CFO and CFN tokens in the third region, suggesting a similar processing by both groups.

Regardless, the significantly slower RTs in the first and second regions of interest do not indicate that the L2 speaker group has not converged on the discourse distribution of subject pronouns in Contrastive Focus contexts. As was cautioned with respect to the differences found in average RT in the GJCT task, while it may initially seem as though the L2 speaker group differs from the native speaker group in terms of their processing of the discourse distribution of overt and null subjects in Spanish, a comparison between the RT to the infelicitous and felicitous tokens must be made before drawing this conclusion. As was described in Section 5.3, slower RTs are expected when participants detect ungrammaticality or infelicitousness. Therefore, the same examination of average differential RT between the felicitous and infelicitous tokens made in Section 5.3.1.5 for the referential and expletive subject tokens will be conducted for the Contrastive Focus tokens in the following section. Specifically, the average differential RT between CFO and CFN tokens will be examined. Since two comparisons are made from within the same data set, a Bonferroni correction was applied, which lowered the original $p$-value of 0.05 to 0.025.
5.3.2.2.3 Comparative analysis of RTs for Contrastive Focus tokens. As discussed above, a simple analysis of overall RT between the groups does not tell us if either group detects the infelicitousness (as evidenced by comparatively slower RTs) of the CFN tokens. Instead, a comparison between the RTs to felicitous and infelicitous tokens needs be performed. Recall that out of the three token types examined in the offline and online versions of the Context-Matching Felicitousness Task, two prefer overt referential subjects (Contrastive Focus and Topic Shift) while one prefers null subjects (Topic Maintenance). Thus, the average differential RT to the overt and null counterbalances within each token type will be compared across each group for the second and third region of interest\textsuperscript{11}. For Contrastive Focus tokens, slower RTs are expected for the null subject tokens since this is the infelicitous token type.

Figure 5-19 below shows the average differential RT for the second region of interest (verb) for the CFN versus CFO tokens. The average differential RT was calculated by subtracting the group average RT to the felicitous CFO from the group average RT to the infelicitous CFN token type. From Figure 5-18, it is clear that the equation described above resulted in a negative average differential RT for both the native speaker group and the L2 speaker group. The native speaker group difference in average RT for the CFN-CFO tokens was greater than that of the L2 speaker group: -11.94ms versus -4.37ms, respectively. The negative result indicates that, on average, the effect of detecting infelicitousness (i.e. slower RTs) is not evidenced in the second region of interest. If it were, we would expect the result to be positive since the first element of the equation, CFN, would produce a comparatively slower RT than that of the second element, CFO.

\textsuperscript{11} No comparison can be made for the first region of interest, the subject \textit{ella} “she,” since it is necessarily present in the Contrastive Focus with overt subject tokens but necessarily absent in the Contrastive Focus with null subject tokens. This is true of the Topic Shift and Topic Maintenance tokens as well.
An independent samples t-test was conducted to determine if the average differential between the groups was significantly different. The independent samples t-test revealed no statistically significant difference in average differential RT for the CFN-CFO counterbalance (t(30) = 0.506, p = 0.617). This suggests that neither participant group distinguished between the infelicitous and felicitous Contrastive Focus tokens.

Figure 5-19 below shows the average differential RT to the third region of interest (DO). As Figure 5-19 shows, an interesting difference obtains for the third region of interest: the average differential RT for the native speaker group is negative (-20.24ms), but for the L2 speaker group it is positive (66.10ms), as would be expected if the participants detected the infelicitous nature of the null subject in the CFN tokens. The positive result evidenced in the L2 speaker group demonstrates that they have detected the infelicity of the null referential subject, but the lack thereof with respect to the native speaker participants indicates that they have not.
Figure 5-19. Online CMFT comparative group results for third region (DO). NS=native speaker; L2=second language speaker; CFN-CFO=group average RT to CFN tokens minus group average RT to CFO tokens

The independent samples t-test revealed a statistically significant difference in average differential RT for the CFN-CFO counterbalance \((t(30) = -2.513, p = 0.018)\). While this result indicates processing differences between the two groups, it should be pointed out that the L2 speaker group has performed as expected.

5.3.2.3 Topic Shift tokens

Half of the 12 target sentences in Topic Shift contexts contained overt subject pronouns while half contained null subject pronouns. Recall from Section 3.2.2.2 that overt subjects are felicitous in Topic Shift contexts while null subjects are infelicitous. Example (44), which has been reproduced below as (62), provides a Topic Shift context as well as an overt and null subject target sentence, respectively. As with previous tokens, the forward slashes (/) indicate the divisions between the regions of interest.

(62). Mi hija quiere ser autora y no tiene otros intereses. Yo creo que es mejor tener varios intereses y sugiero otras actividades, pero no importa lo que diga yo.
“My daughter wants to be an author and she has no other interests. I think that it is best to have various interests and I suggest other activities, but it doesn’t matter what I say.”

b. #Finalmente/esciene/cuentos/y/pasa/todo el día/en su cuarto.

“In the end, she writes stories and she spends the whole day in her room.”

In order to statistically compare the RTs for each region of interest, all regions of interest were consistently divided as is seen in example (62) above. The regions of interest analyzed in the following sections for Topic Shift tokens with overt subjects such as example (62) above are the subject *ella* “she,” the verb *escribe* “writes” and the spillover region DO *cuentos* “stories.” In examples like (62), which contain a null subject, the regions of interest are *escribe* “writes” and *cuentos* “stories.” The following subsections provide the descriptive results, statistical analysis and interpretation.

5.3.2.3.1 Descriptive and statistical analyses. This section provides descriptive and statistical analysis of the RT data for the Topic Shift with overt subject (TSO) tokens and the Topic Shift with null subject (TSN) tokens. The data were treated in the same manner described in Section 5.3.2.2.1. The figures and statistical analyses are provided according to the region of interest; accordingly, Figure 5-20 below provides a visual representation of the group average RT for the native speaker and L2 speaker groups for the first region of interest. Subsequently, Figures 5-21 and 5-22 provide information regarding the second and third regions of interest. Regarding Figure 5-20, it is shown that for the first region of interest the native speaker group average RT for the Topic Shift with overt subject tokens (TSO) was faster than that of the L2 speaker group: 307.64ms versus 440.96ms, respectively. The native speaker range was 197.50-378.50ms with a standard deviation of 51.98ms. The L2 speaker range was substantially higher at 382.67-487.00ms with a standard deviation of 39.60ms.
To compare the two group’s RT to the TSO tokens in the first region, a post-hoc pairwise t-test for independent samples (with Bonferroni adjustment) was conducted across contexts and groups. The result showed that the native speaker group’s average RT was significantly faster than that of the L2 speaker group’s for ($p = 0.000$).

Next, Figure 5-21 provides a visual representation of the group average RT for the native speaker and L2 speaker groups for the second region of interest, the verb. Here again, the native speaker group average RT for the TSO tokens was faster than that of the L2 speaker group: 325.66ms versus 509.35ms, respectively. The native speaker group range was 228.17-536.60ms with a standard deviation of 74.57ms. The L2 speaker range was again higher at 356.80-673.80ms and the standard deviation was 114.04ms. The same is true with respect to the TSN tokens in that the native speaker group average RT was 347.05ms while that of the L2 speaker group was 536.93ms. Regarding the TSN tokens, the native speaker group average RT was 347.05ms while that of the L2 speaker group was higher at 536.39ms. The native speaker range
was 237.00-518.75ms with a standard deviation of 70.71ms. The L2 speaker range was substantially higher at 434.25-666.83ms with a standard deviation of 98.82ms.

![Figure 5-21. Online CMFT group results: Topic Shift tokens for second region (verb). NS=native speaker; L2=second language speaker; TSO=Topic Shift with overt subject; TSN=Topic Shift with null subject](image)

With respect to the Subject Type and Context Type interaction in the second region of interest, the post-hoc pairwise t-test for independent samples (with Bonferroni adjustment) revealed no significant difference in average RT for the TSO versus TSN tokens for the native speaker group \((p = 0.094)\). The same result obtained with respect to the L2 speaker group. Their average RT to the TSO versus TSN tokens did not differ for the second region of interest \((p = 0.600)\). These findings are unexpected if the participants detect the infelicitousness of the TSN tokens.

For the Group comparison, the native speaker group average RT was found to be significantly faster than that of the L2 speaker group for TSO tokens in the second region \((p = 0.000)\). The same was found for the TSN tokens \((p = 0.000)\).
Lastly, Figure 5-22 provides a visual representation of the group average RT for the native speaker and L2 speaker groups for the final region of interest, the DO. As with the previous regions of interest, the native speaker group average RT for the TSO tokens was faster than that of the L2 speaker group: 368.46ms versus 613.18ms, respectively. Finally, the native speaker group average for the spillover region, the direct object (DO), was 368.46ms while that of the L2 speaker group was 613.18ms. The range of the native speaker group was 229.17-573.00ms with a standard deviation of 84.97ms. The range of the L2 speaker group was again higher (462.50-842.25ms) and their standard deviation was 142.29ms. The same is true of the TSN tokens; the native speaker group average RT was 343.87ms while that of the L2 speaker group was 718.75ms. Lastly, the average RT for TSN tokens in the native speaker group was 343.87ms while that of the L2 speaker group was quite a bit higher at 718.75ms. The native speaker group range was 249.00-444.33ms with a standard deviation of 58.27ms. The L2 speaker range was again higher at 562.60-995.33ms and the standard deviation was 177.49ms.

![Figure 5-22. Online CMFT group results: Topic Shift tokens for third region (DO). NS=native speaker; L2=second language speaker; TSO=Topic Shift with overt subject; TSN=Topic Shift with null subject](image-url)
Regarding the Subject Type and Context Type interaction in the third region of interest, the post-hoc pairwise t-test for independent samples (with Bonferroni adjustment) showed a significant difference in average RT for the TSO versus TSN tokens for the native speaker group ($p = 0.024$). The same result obtained with respect to the L2 speaker group. Their average RT to the TSO versus TSN tokens differed for the third region of interest ($p = 0.016$). These findings are expected if the participants detect the infelicitousness of the TSN tokens.

With respect to the Group comparison, the native speaker group average RT was found to be significantly faster than that of the L2 speaker group for TSO tokens in the second region ($p = 0.073$). The same was found for the TSN tokens ($p = 0.090$). The following section provides an interpretation of the results of the Topic Shift tokens for the three regions of interest.

### 5.3.2.3.2 Interpretation of results

For the comparison between overt and null subjects in Topic Shift contexts, neither the native speaker nor L2 speaker group showed significantly slower RTs to the infelicitous TSN tokens in the second region of interest. While this may be unexpected, both groups showed significantly slower RTs to the TSN tokens in the third region of interest, demonstrating their distinction between the use of overt and null subjects in Topic Shift contexts. Regarding the comparison made between the two participant groups the native speaker group average RT to the three regions of interest for both TSO and TSN tokens was faster than that of the L2 speaker group. For the first region of interest, the Bonferroni post-hoc tests revealed a statistically significant difference between the native speaker and L2 speaker groups with respect to their RTs to TSO tokens. Recall that this finding can only be due to the slower overall RT of the L2 group since no other factors were present in the analysis of this region. For the second region of interest, statistically significant differences were found between the two groups for the TSO and TSN tokens, which again are likely a product of the overall
slower RT of the L2 group as compared to the native speaker group. Finally, and unlike the previous two regions, no statistically significant differences were found between the native speaker and L2 speaker group for TSO and TSN tokens in the third region, suggesting a similar processing by both groups. As discussed in Section 5.3.2.2.2, the significantly slower RTs in the first and second regions of interest do not indicate that the L2 speaker group has not converged on the discourse distribution of subject pronouns in Contrastive Focus contexts. A comparison between the RT to the infelicitous and felicitous tokens must be made before drawing this conclusion. As such, the same examination of average differential RT between the felicitous and infelicitous tokens made in Section 5.3.1.5 for the Contrastive Focus tokens is shown for the Topic Shift below. A Bonferroni correction was applied, which lowered the original $p$-value of 0.05 to 0.025.

5.3.2.3.3 Comparative analysis of RTs for Topic Shift tokens. This section provides a comparison of the RTs to felicitous and infelicitous Topic Shift tokens. As discussed in Section 5.3.2.1.3, the average differential RT to the overt and null Topic Shift tokens will be compared across each group for the second and third region of interest. In both comparisons, slower RTs are expected for TSN tokens since this is the infelicitous token type. Figure 5-23 below shows the average differential RT for the second region of interest (the verb) for the TSN versus TSO tokens. Again, the average differential RT was calculated by subtracting the group average RT to the felicitous TSO from the group average RT to the infelicitous TSN token type. In Figure 5-23, we see that the equation outlined above resulted in a positive average differential RT for both the native speaker group and the L2 speaker group and that the results were quite similar: 21.39ms and 27.04ms, respectively. The positive result indicates that, on average, the effect of detecting infelicitousness (i.e. slower RTs) is in fact evidenced in the second region of interest.
The independent samples t-test revealed no statistically significant difference in average differential RT between the two participant groups for the TSN-TSO counterbalance ($t(30) = 1.205$, $p = 0.238$), indicating that the distinction the L2 speaker group made between the infelicitous and felicitous Topic Shift tokens matched that of the native speaker group.

Finally, Figure 5-24 shows the differential RT to the third region of interest, which was the DO. Similarly to what was seen with the Contrastive Focus tokens in Section 5.3.2.2.3, the average differential RT for the native speaker group is negative (-24.59ms), but for the L2 speaker group it is positive (105.58ms), which is expected if the participants detect the infelicitous nature of the null subject in the TSN tokens. The positive result evidenced in the L2 speaker group demonstrates that they have detected the infelicitousness of the null referential subject.
Nevertheless, no statistically significant difference was found by the independent samples t-test with respect to the average differential RT for the TSN-TSO counterbalance ($t(30) = -1.575, p = 0.126$). This indicates that the distinction between the infelicitous and felicitous Topic Shift tokens made by the L2 speaker group matched that of the native speaker group.

### 5.3.2.4 Topic Maintenance tokens

Finally, the 12 Topic Maintenance tokens were divided evenly across target sentences with overt subject pronouns (n=6) and null subject pronouns (n=6). As discussed in Section 3.2.2.2, overt subjects are less preferred in Topic Maintenance contexts while null subjects are preferred. Example (45), reproduced below as (63), shows a Topic Maintenance context with both an overt and null subject target sentence. As in previous token types, the forward slashes (/) indicate the divisions between the regions of interest.

(63). Mi cuñada es muy sociable. Tiene muchos amigos y por eso va a muchas cenas a la canasta donde tiene que contribuir con algo.
“My daughter-in-law is very social. She has a lot of friends and for that reasons, she goes to a lot of potluck dinners where she has to share something.”

a. Así que/ella/lleva/postres/y/comparte/todo/con sus amigos.
b. Así que/lleva/postres/y/comparte/todo/con sus amigos.
“So, she takes desserts and shares everything with her friends.”

All Topic Maintenance tokens were consistently divided to allow for statistical comparison of the RTs for each region of interest. With respect to tokens like (63a) which contain an overt subject, the regions of interest are the subject ella “she,” the verb lleva “takes” and the spillover region DO postres “desserts.” In examples like (63b), which contain a null subject, the regions of interest are the verb lleva “takes” and spillover region DO postres “desserts.” The following subsections provide the descriptive results, statistical analysis and interpretation.

5.3.2.4.1 Descriptive and statistical analyses. Next, this section provides a statistical analysis of the RT data for the Topic Maintenance with overt subject (TMO) tokens and the Topic Shift with null subject (TMN) tokens. The data were treated as described for the Contrastive Focus and Topic Shift tokens. As with these two previous token types, figures and statistical analyses are provided according to the regions of interest (the subject ella “she,” the verb and the direct object (DO)). Accordingly, Figure 5-25 provides a visual representation of the group average RT to the first region of interest for the native speaker and L2 speaker groups. Figures 5-26 and 5-27 provide information regarding the second and third regions of interest, respectively. The average RT for the native speaker group for the first region of interest, the subject ella “she,” was 341.44ms while that of the L2 speaker group was higher at 458.47ms. The native speaker range for the first region of interest was 246.67-432.25ms with a standard deviation of 50.34. The L2 speaker range was higher at 409.75-490.40ms with a very low standard deviation of 29.76.
As was done with the previous two regions, in order to compare the two group’s RT to the TMO tokens in the first region, a post-hoc pairwise t-test for independent samples (with Bonferroni adjustment) was conducted across contexts and groups. The result showed that the native speaker group’s average RT was significantly faster than that of the L2 speaker group’s for ($p = 0.000$).

Next, Figure 5-26 provides below a visual representation of the group average RT for the native speaker and L2 speaker groups for the second region of interest, the verb. For this region, the average RT for the TMO tokens for the native speaker group was 315.71ms while that of the L2 speaker group was again higher at 520.16ms. The native speaker group range was 231.83-483.50ms with a standard deviation of 66.65ms. The L2 speaker range was again higher at 417.80-635.60ms and the standard deviation was 88.80ms. Regarding the TMN tokens, the average RT for the native speaker group was 321.90ms while that of the L2 speaker group was higher at 535.73ms. The native speaker range for the first region of interest was 214.75-
455.67ms with a standard deviation of 62.23ms. The L2 speaker range was substantially higher at 416.00-638.83ms with a standard deviation of 77.73ms.

<table>
<thead>
<tr>
<th>Group Average Reaction Time (milliseconds)</th>
<th>#TMO</th>
<th>TMN</th>
</tr>
</thead>
<tbody>
<tr>
<td>NS</td>
<td>315.71</td>
<td>321.90</td>
</tr>
<tr>
<td>L2</td>
<td>520.16</td>
<td>535.73</td>
</tr>
</tbody>
</table>

Figure 5-26. Online CMFT group results: Topic Maintenance tokens for second region (verb). NS=native speaker; L2=second language speaker; TMO=Topic Maintenance with overt subject; TMN=Topic Shift with null subject

Regarding the Subject Type and Context Type interaction in the second region of interest, the post-hoc pairwise t-test for independent samples (with Bonferroni adjustment) showed no significant difference in average RT was found for the TMO versus TMN tokens for the native speaker group ($p = 0.619$). Likewise, no significant difference in average RT was found for the TMO versus TMN tokens in the L2 speaker group ($p = 0.546$). These results are unexpected in the participants detect the infelicitousness of the TMO tokens.

For the Group comparison, the native speaker group average RT was found to be significantly faster than that of the L2 speaker group for TMO tokens in the second region ($p = 0.000$). The same was found for the TMN tokens ($p = 0.000$).

Finally, Figure 5-27 provides a visual representation of the group average RT for the native speaker and L2 speaker groups for the TMO and TMN tokens in third region of interest,
the DO. Here, the native speaker group average RT was 355.07ms while that of the L2 speaker
group was 699.00ms. The range of the native speaker group was 213.50-611.67ms with a
standard deviation of 97.52ms. The range of the L2 speaker group was substantially higher at
527.40-891.60ms with a standard deviation of 135.31ms. With respect to the TMN tokens, the
average RT for the native speaker group was 354.61ms while that of the L2 speaker group was
substantially higher at 661.17ms. The native speaker group range was 240.00-539.00ms with a
standard deviation of 86.63ms. Here again, the L2 speaker range was higher at 396.00-
1080.80ms and the standard deviation was 248.95ms.

![Bar chart showing Group Average Reaction Time (milliseconds) for #TMO and TMN tokens]

Figure 5-27. Online CMFT group results: Topic Maintenance tokens for third region (DO).
NS=native speaker; L2=second language speaker; TMO=Topic Maintenance with overt subject; TMN=Topic Maintenance with null subject

For the Subject Type and Context Type interaction in the last region of interest, the post-
hoc pairwise t-test for independent samples (with Bonferroni adjustment) showed no significant
difference in average RT was found for the TMO versus TMN tokens for the native speaker
group (p = 0.978). Likewise, no significant difference in average RT was found for the TMO
versus TMN tokens in the L2 speaker group ($p = 0.804$). These results are unexpected if the participants detect the infelicitousness of the TMO tokens.

Regarding the Group comparison, no significant difference was found between the native speaker group average RT to TMO tokens as compared to that of the L2 speaker group ($p = 0.429$). However, the native speaker group average RT was significantly faster for TMN tokens than that of the L2 speaker group ($p = 0.000$). The next section provides an interpretation of the results found for all three regions of interest.

5.3.2.4.2 Interpretation of results. As with the previous two token types, a comparison between overt and null subjects in Topic Maintenance contexts was made. In both the second and third region of interest, neither the native speaker nor L2 speaker group showed significantly slower RTs to the infelicitous TMO tokens as compared to the felicitous TMN tokens. This is an unexpected finding and may be interpreted as neither group distinguishing between TMO and TMN tokens. Nonetheless, the L2 speaker group performed as the native speaker group did. With respect to the comparison made between the two participant groups and as in the previous two token types, the native speaker group average RT to the three regions of interest for TMO and TMN tokens was faster than that of the L2 speaker group. For the first region of interest, the post-hoc tests revealed a statistically significant difference between the native speaker and L2 speaker groups with respect to their RTs to TMO tokens. This finding can only be due to the slower overall RT of the L2 group since no other factors were present in the analysis of this region. The same is true of both TMO and TMN tokens in the second region of interest and for the TMN tokens for the third region of interest. As previously discussed, the significantly slower RTs in the do not indicate that the L2 speaker group has not converged on the discourse distribution of subject pronouns in Contrastive Focus contexts. Rather, an examination of the
participant groups’ average differential RT between the felicitous and infelicitous tokens must be conducted. The results are described below in Section 5.3.2.4.3 and the same Bonferroni correction was applied, effectively lowering the original \( p \)-value of 0.05 to 0.025.

**5.3.2.4.3 Comparative analysis of RTs for Topic Maintenance tokens.** Finally, this section presents a comparison of the RTs to felicitous and infelicitous Topic Maintenance tokens. The average differential RT to the overt and null Topic Maintenance tokens will be compared across each group for the second and third region of interest. Across both comparisons, slower RTs are expected for the overt subjects since these are less preferred than null subjects in Topic Maintenance contexts. Figure 5-28 below shows the average differential RT for the second region of interest (the verb) for the TMO versus TMN tokens. Here again, the average differential RT was calculated by subtracting the group average RT to the felicitous TMN from the group average RT to the infelicitous TMO token type.

![Figure 5-28](image)

Figure 5-28. Online CMFT comparative group results for second region (verb). NS=native speaker; L2=second language speaker; TMO-TMN=group average RT to TMO tokens minus group average RT to TMN tokens
In Figure 5-28, we see that the equation outlined above resulted in a negative average differential RT for both the native speaker and the L2 speaker group: -6.20ms and -15.57ms, respectively. The negative result indicates that, on average, the effect of detecting infelicitousness (i.e. slower RTs) was not evidenced in the second region of interest.

The independent samples t-test revealed no statistically significant difference in average differential RT for the TMO-TMN counterbalance: t(30) = -0.141, p = 0.889. This finding suggests that the distinction the L2 speaker group made between the infelicitous and felicitous Topic Maintenance tokens equals that of the native speaker group.

![Figure 5-29. Online CMFT comparative group results for third region (DO). NS=native speaker; L2=second language speaker; TMO-TMN=group average RT to TMO tokens minus group average RT to TMN tokens](image)

Lastly, Figure 5-29 above shows the differential RT to the third region of interest, which was the direct object (DO). For both participant groups, the average differential RT was positive: 0.46ms for the native speaker group and 37.84ms for the L2 speaker group. This finding is expected if the participants detect the infelicitous nature of the overt subject in the TMO tokens.
Thus, the positive result evidenced in both participant groups demonstrates that they have
detected this infelicity.

The independent samples t-test revealed no statistically significant difference with respect
to the average differential RT for the TMO-TMN counterbalance (t(30) = 0.247, p = 0.807). This
indicates that the distinction the L2 speaker group made between the infelicitous and felicitous
Topic Maintenance tokens matched that of the native speaker group.

5.3.2.5 Context Type comparison (Contrastive Focus versus Topic Shift versus Topic
Maintenance)

This section explains the second comparison between Contrastive Focus, Topic Shift and
Topic Maintenance tokens described in Footnote 10 above. The results for the second and third
regions of interest are presented. For the second region of interest, the post-hoc pairwise t-test for
independent samples (with Bonferroni adjustment) showed that no significant difference between
the native speaker group’s RT to the felicitous CFO tokens as compared to the felicitous TSO
tokens (p = 1.000). This finding is expected since both token types are felicitous. The same is
true of the native speaker group’s RT to CFO tokens as compared to infelicitous TMO tokens (p
= 1.000). These findings are unexpected since only CFO tokens are felicitous. Finally, no
significant difference was found between the native speaker group’s average RT to felicitous
TSO tokens as compared to infelicitous TMO tokens (p = 1.000). The same results obtained for
the L2 speaker group in that no differences between RTs were found between CFO and TSO
tokens (p = 1.000), CFO and TMO tokens (p = 1.000) or TSO and TMO tokens (p = 1.000). In
the case of the CFO and TSO comparison, this result is expected since both tokens are felicitous;
however the latter two findings are unexpected. Regarding the null tokens, the native speaker
group’s average RT to the CFN tokens was significantly faster than that of their RT to the TSN
tokens comparison (p = 0.004). This is perhaps unexpected since both tokens are infelicitous. For
the CFN versus TMN comparison, no significant difference was found ($p = 0.148$), which is unexpected since only the TMN tokens are felicitous. Finally, the native speaker group’s average RT to the TSN tokens did not differ significantly from their RT to the TMN tokens ($p = 0.064$). This result is unexpected since only TMN tokens are felicitous. With respect to the L2 speaker group, no significant difference was found in RT for the CFN versus TSN comparison ($p = 1.000$), for the CFN versus TMN comparison ($p = 1.000$) nor for the TSN versus TMN comparison ($p = 1.000$). The first result is expected since both tokens are infelicitous; however a significant difference was expected for the final two comparisons as only the TMN tokens are felicitous.

Finally, for the third region of interest, the post-hoc pairwise t-test for independent samples (with Bonferroni adjustment) revealed no significant difference between the native speaker group’s RT to the felicitous CFO tokens as compared to the felicitous TSO tokens ($p = 0.697$). This finding is expected since both token types are felicitous. The same is true of the native speaker group’s RT to CFO tokens as compared to infelicitous TMO tokens ($p = 0.482$), which is unexpected since only CFO tokens are felicitous. Finally, no significant difference was found between the native speaker group’s average RT to felicitous TSO tokens as compared to infelicitous TMO tokens ($p = 0.592$), which is also unexpected. For the L2 speaker group, the average RT to the felicitous CFO tokens was significantly slower than that of the felicitous TSO tokens ($p = 0.003$), which is perhaps unexpected since both are felicitous. No significant difference was found in RT to the CFO and TMO tokens ($p = 0.673$), which is unexpected since only the CFO tokens are felicitous. Finally, the L2 speaker group’s average RT to the felicitous TSO did not differ significantly from that of the infelicitous TMO tokens ($p = 0.401$), which is unexpected. With respect to the null tokens, the native speaker group’s average RT to the CFN
tokens did not differ significantly from that of their RT to the TSN tokens comparison ($p = 1.000$). This is not unexpected since both tokens are infelicitous. For the CFN versus TMN comparison, no significant difference was found ($p = 1.000$). Finally, the native speaker group’s average RT to the TSN tokens did not differ significantly from their RT to the TMN tokens ($p = 1.000$). Neither of the latter two results is expected since only TMN tokens are felicitous. For the L2 speaker group, no significant difference was found in RT for the CFN versus TSN comparison ($p = 0.542$). However, their average RT to the CFN tokens as compared to the TMN tokens was significantly slower ($p = 0.017$), which is expected since only TMN tokens are felicitous. Regarding the TSN versus TMN comparison, no significant difference in RT was found ($p = 0.542$), which is unexpected since only TMN tokens are felicitous.

5.3.2.6 Comparative analysis of RTs across token type

One final comparison will be made across the token types. Recall that Contrastive Focus and Topic Shift contexts prefer overt subjects while Topic Maintenance contexts prefer null subjects. Thus, we can determine if the participant groups are slower with overt subjects in Topic Maintenance contexts than in Contrastive Focus and Topic Shift contexts, yet slower with null subjects in Contrastive Focus and Topic Shift contexts as compared to Topic Maintenance contexts. Equally, as the offline data showed more categorical responses to the Contrastive Focus tokens, we can compare them to Topic Shift tokens. Thus, the average differential RT between the CFO and TMO tokens, CFO and TSO tokens and TSO and TMO is compared across each group for all three regions of interest. Similarly, the average differential RT between the CFN and TMN tokens, CFN and TSN tokens and TSN and TMN tokens is compared across each group for all three regions of interest. Slower RTs are expected for the overt subjects in Topic Maintenance contexts as compared to Contrastive Focus or Topic Shift contexts, since these are less preferred than null subjects in Topic Maintenance contexts. On the other hand, slower RTs
are expected for the null subjects in Contrastive Focus and Topic Shift contexts as compared to Topic Maintenance contexts, since these are less preferred than overt subjects in Contrastive Focus and Topic Shift contexts. Independent samples t-tests were performed to determine if the group average differential RTs were statistically significant. Since two comparisons are made from within the same data set, a Bonferroni correction was applied, which lowered the original p-value of 0.05 to 0.025.

Figure 5-30 below shows the average differential RT for the first region of interest (ella “she”) for the TMO versus CFO tokens, TMO versus TSO tokens and the CFO-TSO tokens. As before, the average differential RT was calculated by subtracting the group average RT to the felicitous CFO or TSO token type from the group average RT to the infelicitous TMO token type.

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<thead>
<tr>
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<th>TMO-CFO</th>
<th>TMO-TSO</th>
<th>CFO-TSO</th>
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<tbody>
<tr>
<td>NS</td>
<td>39.15</td>
<td>33.80</td>
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<tr>
<td>L2</td>
<td>22.29</td>
<td>17.50</td>
<td>-4.79</td>
</tr>
</tbody>
</table>

Figure 5-30. Online CMFT comparative group results for first region (ella “she”). NS=native speaker; L2=second language speaker; TMO-CFO=group average RT to TMO tokens minus group average RT to CFO tokens; TMO-TSO=group average RT to TMO tokens minus group average RT to TSO tokens; CFO-TSO=group average RT to CFO tokens minus group average RT to TSO tokens
In Figure 5-30, we see that the equation outlined above resulted in a positive average differential RT for both the native speaker group and the L2 speaker for the first two comparisons (39.15ms and 22.29ms, respectively, for the TMO-CFO comparison and 33.80ms and 17.50ms, respectively, for the TMO-TSO comparison), but a negative average for the third comparison (05.35ms and 04.79ms, respectively, for the CFO-TSO comparison). The two positive results indicate that, on average, the participant groups’ RTs are slower for the first region of interest for infelicitous TMO tokens than for felicitous CFO or TSO tokens. The negative result found for the third comparison indicates that, on average, the participant groups’ RTs are faster for the first region of interest for felicitous CFO tokens than for felicitous TSO tokens. An independent samples t-test was conducted to determine if the average differential between the groups was significantly different.

The t-test revealed no statistically significant difference in differential RT for the TMO-CFO counterbalance (t(30) = 0.719, p = 0.478) or for the TMO-TSO counterbalance (t(30) = 1.110, p = 0.276). Finally, no significant difference between the groups’ differential RT for the CFO-TSO tokens was found (t(30) = -0.028, p = 0.978). These findings suggest that the distinction the L2 speaker group made between the infelicitous TMO and felicitous CFO and TSO tokens equals that of the native speaker group and that the average differential RT to the CFO versus TSO tokens of the L2 speaker group matched that of the native speaker group.

Next, Figure 5-31 shows the average differential RTs to the overt subject tokens for the second region of interest, which corresponds to the verb. With respect to the TMO-CFO comparison, for both participant groups the average differential RT was negative: -4.12ms and -1.54ms, respectively. The native speaker group also demonstrated a negative average differential RT for the TMO-TSO comparison (-9.96ms) and the CFO-TSO comparison while the L2
speaker group’s average differential RT was positive (10.81ms and 12.36ms, respectively). With respect to the TMO-CFO tokens, these findings are unexpected if the participant groups detect the infelicitous nature of the overt subject in TM contexts in the verb region. The same is true of the native speaker group for the TMO-TSO tokens. For the L2 speaker group, though, the positive result suggests that they have detected the infelicitous nature of the overt subject in TM contexts as compared to its felicitous nature in TSO contexts.

The independent samples t-tests revealed no statistically significant difference with respect to the average differential RT for the TMO-CFO counterbalance ($t(30) = -0.94, p = 0.926$), for the TMO-TSO counterbalance ($t(30) = -0.756, p = 0.456$) or for the CFO-TSO comparison ($t(30) = -0.638, p = 0.528$). These findings indicate that the distinction the L2 speaker group made between the infelicitous TMO tokens and the felicitous CFO and TSO tokens.

Figure 5-31. Online CMFT comparative group results for second region (verb). NS=native speaker; L2=second language speaker; TMO-CFO=group average RT to TMO tokens minus group average RT to CFO tokens; TMO-TSO=group average RT to TMO tokens minus group average RT to TSO tokens; CFO-TSO=group average RT to CFO tokens minus group average RT to TSO tokens.
tokens matched that of the native speaker group and that no differences were found between the two groups with respect to the CFO-TSO comparison.

The null subject token comparisons are shown below for the second region. Regarding the CFN-TMN and CFN-TSN comparisons, the average differential RT was negative for the native speaker and L2 speaker groups: -14.02ms and -18.40ms and -39.17ms and -19.05ms, respectively. However, for the TSN-TMN comparison, both groups demonstrated a positive average differential RT: 25.15ms for the native speaker group and 0.66ms for the L2 speaker group. If the participant groups detect the infelicitous nature of null subjects in Contrastive Focus contexts as compared to its felicitous nature in Topic Maintenance contexts, these findings are unexpected since we would expect a slower RT for the CFN tokens than for the TMN tokens. The same expectation is true of TSN tokens as compared to the TMN tokens, and here this expectation is evidenced for both groups.

Figure 5-32. Online CMFT comparative group results for second region (verb). NS=native speaker; L2=second language speaker; CFN-TMN=group average RT to CFN tokens minus group average RT to TMN tokens; TSN-TMN=group average RT to TSN tokens minus group average RT to TMN tokens; CFN-TSN=group average RT to CFN tokens minus group average RT to TMN tokens
The independent samples t-tests revealed no statistically significant differences with respect to the average differential RT for the CFN-TMN counterbalance \((t(30) = 0.203, p=0.841)\), for the CFN-TMN counterbalance \((t(30) = 0.766, p=0.450)\) or for the CFN-TSN comparison \((t(30) = -0.550, p = 0.586)\). These findings indicate that the distinction the L2 speaker group made between the infelicitous CFN and TSN tokens and the felicitous TMN tokens matched that of the native speaker group and that their average differential RT to the CFN-TSN comparison also matched that of the native speaker group.

Next, Figure 5-33 below provides the average differential RTs to the overt subject tokens for the final region of interest, the DO. For the TMO-CFO comparison for the DO region of interest, the average differential RT of both the native speaker and the L2 speaker group was negative: -19.56ms and -27.68ms, respectively.

![Figure 5-33](image)

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<tr>
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<th>TMO-CFO</th>
<th>TMO-TSO</th>
<th>CFO-TSO</th>
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<tbody>
<tr>
<td>NS</td>
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<tr>
<td>L2</td>
<td>-27.68</td>
<td>85.83</td>
<td>113.50</td>
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Figure 5-33. Online CMFT comparative group results for third region (DO). NS=native speaker; L2=second language speaker; TMO-CFO=group average RT to TMO tokens minus group average RT to CFO tokens; TMO-TSO=group average RT to TMO tokens minus group average RT to TSO tokens; CFO-TSO=group average RT to CFO tokens minus group average RT to TSO tokens
The native speaker group also demonstrated a negative average differential RT for the TMO-TSO comparison (-13.39ms) while the L2 speaker group’s average differential RT was positive (85.83ms). Finally, both participant groups evidenced a positive average differential RT for the CFO-TSO comparison (6.17ms and 113.50ms, respectively). Considering the TMO-CFO tokens, these findings are unexpected if the participant groups detect the infelicitous nature of the overt subject in TM contexts in the DO region¹². This also applies to the native speaker group for the TMO-TSO tokens since slower RTs are expected for the infelicitous TMO tokens as compared to the felicitous TSO tokens. For the L2 speaker group, though, the positive result suggests that they have detected the infelicitousness of the TMO tokens as compared to the felicitousness of the TSO tokens.

The independent samples t-tests revealed no statistically significant differences with respect to the average differential RT for the TMO-CFO counterbalance (t(30) = 0.207, p = 0.837). Nevertheless, one was found for the TMO-TSO counterbalance (t(30) = -2.698, p = 0.011). Thus, it appears that the L2 speaker group does not differ from the native speaker group for the TMO-CFO comparison, but that they do for the TMO-TSO comparison. Note however, that for this latter comparison, the L2 speaker group’s average differential RT was positive, as expected. Finally, the independent samples t-test showed a significant difference between the two groups for the CFO-TSO comparison: (t(30) = -3.528, p = 0.001). This indicates that the L2 speaker group average RT for the third region of interest is significantly slower in Contrastive Focus tokens than in Topic Shift tokens whereas these same RTs are more similar in the native speaker group.

¹² However, recall from Figure 5-31 that both the native speaker and L2 speaker performed as expected with respect to the TMO-CFO distinction. This indicates that their detection of the infelicitous nature of the overt subject in TM contexts as compared to the felicitous nature of it in Contrastive Focus contexts occurs in the subject region.
Finally, Figure 5-34 shows the average differential RTs to the null subject tokens for the DO. The average differential RT between the CFN and TMN tokens was negative for the native speaker group (-0.22) but positive for the L2 speaker group (131.61ms). For the TSN-TMN comparison, the same pattern is evidenced: the native speaker group average differential RT between the TSN and TMN tokens was negative (-11.20ms) but positive for the L2 speaker group (19.75ms). Regarding the native speaker group, if they detect the infelicitous nature of null subjects in Contrastive Focus contexts as compared to their felicitous nature in Topic Maintenance contexts, these findings are unexpected since we would expect a slower RT for the CFN tokens than for the TMN tokens. The same is true of TSN tokens as compared to the TMN tokens. Only in the case of the L2 speaker group does this expectation obtain. Finally, both participant groups showed positive average differential RTs for the CFN-TSN comparison.

![Bar graph showing the difference in average reaction time (milliseconds) for the native speaker group (NS) and the L2 speaker group (L2) for the CFN-TMN, TSN-TMN, and CFN-TSN comparisons.](image)

<table>
<thead>
<tr>
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<th>CFN-TMN</th>
<th>TSN-TMN</th>
<th>CFN-TSN</th>
</tr>
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<tr>
<td>NS</td>
<td>-0.22</td>
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<td>10.52</td>
</tr>
<tr>
<td>L2</td>
<td>131.61</td>
<td>19.75</td>
<td>74.03</td>
</tr>
</tbody>
</table>

Figure 5-34. Online CMFT comparative group results for third region (DO). NS=native speaker; L2=second language speaker; CFN-TMN=group average RT to CFN tokens minus group average RT to TMN tokens; TSN-TMN=group average RT to TSN tokens minus group average RT to TMN tokens; CFN-TSN=group average RT to CFN tokens minus group average RT to TMN tokens.
The independent samples t-tests revealed a statistically significant difference with respect to the average differential RT for the CFN-TMN counterbalance ($t(30) = -3.937, p=0.000$) while no statistically significant difference was found for the TSN-TMN counterbalance ($t(30) = -0.832, p=0.412$) or for the CFN-TSN comparison ($t(30) = -1.148, p = 0.111$). These findings indicate that the distinction the L2 speaker group made between the infelicitous CFN tokens and the felicitous TMN tokens differed from that of the native speaker group. It is important to note here that since the L2 speaker group’s average differential RT was positive, they demonstrated the distinction, while the native speaker group did not in this region. The two group’s distinctions between the infelicitous TSN tokens and the felicitous TMN tokens as well as the CFN-TSN comparison matched that of the native speaker group.

To conclude, of the 15 comparisons described in Section 5.3.2.6, 12 showed no statistically significant difference between the native speaker and L2 speaker group (first region of interest: TMO-CFO, TMO-TSO and CFO-TSO; second region of interest: TMO-CFO, TMO-TSO, CFO-TSO, CFN-TMN, TSN-TMN and CFN-TSO; third region of interest: TMO-CFO, TSN-TMN and CFN-TSN). All three statistically significant differences were found in the third region of interest. For two of the statistically significant differences found, CFN-TMN and TMO-TSO, the L2 speaker group performed as expected in that their average differential RT was positive while that of the native speaker group was not. The final statistically significant difference was found for the CFO-TSO comparison for which the L2 speaker group, but not the native speaker group, showed a high average differential RT. Of the 10 comparisons for which there are clear predictions\textsuperscript{13} (first region of interest: TMO-CFO and TMO-TSO; second region of interest: TMO-CFO, TMO-TSO, CFN-TMN and TSN-TMN; third region of interest: TMO-

\textsuperscript{13} It is not clear that any distinction is expected between comparisons CFO-TSO or CFN-TSN, as both Contrastive Focus and Topic Shift contexts prefer overt subjects over null subjects.
CFO, TMO-TSO, CFN-TMN and TSN-TMN), the native speakers demonstrated the predicted
distinction in three comparisons (first region of interest: TMO-CFO and TMO-TSO; second
region of interest: TSN-TMN). The L2 speaker group demonstrated the predicted distinction in
seven of the 10 comparisons (first region of interest: TMO-CFO and TMO-TSO; second region
of interest: TMO-TSO and TSN-TMN; third region of interest TMO-TSO, CFN-TMN and TSN-
TMN). Thus, both the native speaker and L2 speaker groups distinguish between overt and null
subject pronouns in the three contexts examined herein, but differences are seen regarding how
widespread the distinction is. The native speaker group, for example, distinguishes TMO tokens
from CFO and TSO tokens in the first region of interest only, showing an early and brief
distinction between the use of an overt subject pronoun in Topic Maintenance contexts as
compared to Contrastive Focus or Topic Shift contexts. The L2 speaker group also shows this
same early distinction (significant differences were not found between the two participant groups
in the first region of interest); yet, as they also show the predicted distinction between TMO-TSO
in the second and third region of interest, the distinction is not as pinpointed, temporally
speaking, as the native speaker group’s. For the TMO-CFO distinction, no widespread
distinction is seen as compared to the native speaker group. Similarly, a more widespread
distinction between TSN and TMN tokens is seen in the L2 speaker group as they show the
predicted distinction in the second and third region of interest, while the native speaker group
does so in the second region of interest only. Interestingly, the L2 speaker group, but not the
native speaker group, distinguished between CFN and TMN tokens in the third region of interest
only. In general, these findings point to native-like, but more widespread in terms of regions of
interest, distinctions on the part of the L2 speaker group.
5.3.2.7 Summary of online CMFT results

Sections 5.3.2.2, 5.3.2.3, and 5.3.2.4 above examined the RT data to three regions of interest (the subject ella “she,” the verb and the DO) for the six token types examined in the CMFT: CFO, CFN, TSO, TSN, TMO and TMN. No statistically significant distinction obtained between the overt and null subjects in Contrastive Focus contexts for either participant group for the second and third regions of interest, an unexpected finding that may indicate that the task was not able to detect the participants’ sensitivity to this difference. With respect to the Topic Shift tokens, neither group distinguished between overt subjects and null subjects in Topic Shift contexts in the second region of interest, but both groups did so in third region of interest. Equally, the comparisons made between the average differential RTs described in Section 5.3.2.3.3 revealed no significant difference between the groups for average differential RT for the TSN-TSO counterbalance in neither the second nor the third region of interest. This finding indicates that the distinction made by the L2 speaker group between the infelicitous and felicitous Topic Shift tokens matched that of the native speaker group. Finally, for the third token type, no statistically significant differences were found between overt subjects and null subjects for either group in neither the second nor the third region of interest, which, although unexpected since null pronouns are preferred in Topic Maintenance contexts, is supported by variationist literature showing use of overt referential subject pronouns in Topic Maintenance contexts (e.g. Silva-Corvalán 1994; Cameron 1995; Lapidus Shin & Cairns 2012). The comparison examined in Section 5.3.2.4.3 demonstrated that the distinction the L2 speaker group made between the infelicitous and felicitous Topic Maintenance tokens matched that of the native speaker group for the second and third regions of interest, although only in the third region was the expected finding evidenced. Finally, the comparisons made in Section 5.3.2.6 demonstrated that, while more widespread, the distinctions made by the L2 speaker group largely matched those of the
native speaker group, although the L2 speaker group did show more temporally widespread distinctions. Together, these findings provide some evidence in favor of native-like processing with interface-conditioned properties like the distribution of subjects in specific discourse contexts.

5.3.3 Summary of Online Experimental Results

Section 5.3 described two online experimental tasks, the purpose of which was to examine the participants’ processing of the syntactic and discourse distribution of subjects in Spanish. The online GT (Section 5.3.1) assessed the participants’ processing of the syntactic distribution of overt and null referential and expletive subject pronouns in Spanish. The statistical analyses described in Section 5.3.1.2.1 showed that neither the L2 speaker group nor the native speaker group demonstrated significantly different RTs to overt subjects versus null subjects in referential subject tokens in any of the regions of interest. This result is expected since both overt and null referential subjects are grammatical in Spanish. With respect to the expletive tokens described in Section 5.3.1.3.1, neither group demonstrated statistically significant RTs to the ungrammatical ESO tokens as compared to the grammatical ESN tokens in the first region of interest (but see Section 5.3.1.3.2 for explanation). And while the L2 speaker group did not demonstrate a statistically significant difference between these counterbalances in the second region as the native speaker group did, both groups made this distinction for the third region of interest. Since overt subjects in expletive tokens are ungrammatical, differences with respect to the RT to overt and null subjects are expected. Finally, Section 5.3.1.5 provided further evidence for the claim that the processing of the tokens examined in the online version of the GT is native-like. That is, no statistically significant differences were found between the native speaker and the L2 speaker group with respect to the average differential RT between the
ESO versus ESN and the ESO versus RSO. This establishes that the distinction they made between the ungrammatical and grammatical tokens is native-like.

The online CMFT (see Section 5.3.2) assessed the participants’ processing of the discourse distribution of overt and null subjects in Spanish in Contrastive Focus, Topic Shift and Topic Maintenance contexts. As regards the Contrastive Focus tokens, the statistical analyses described in Section 5.3.2.2.1 showed that no statistically significant difference was found between the two groups’ treatment of overt subjects versus null subjects. However, neither group was shown to make the appropriate distinction between overt and null subject referential subject pronouns in the second region of interest and only the L2 speaker group did so in the third region of interest; this may point to the task’s inability to detect the participants sensitivity to the infelicitous nature of the null subject in this context. Nevertheless, evidence pointing to native-like processing between the two participant groups was found for the Topic Shift tokens. Recall that neither group showed a statistically significant difference between their treatment of overt and null subjects in Topic Shift contexts for the second region of interest, but that both groups did so in the third region of interest. This latter finding suggests that the infelicitousness of the null subject is detected by both groups in this context in the same region. Additionally, the comparisons made between the average differential RTs described in Section 5.3.2.3.3 revealed no significant difference between the groups for the TSN-TSO counterbalance in the third region of interest where the distinction between overt and null subjects in Topic Shift contexts was made. This finding indicates that the distinction made by the L2 speaker group between the infelicitous and felicitous Topic Shift tokens matched that of the native speaker group. Next, neither group showed statistically significant differences with respect to their treatment of overt and null subjects in Topic Maintenance contexts in neither the second nor third region of interest,
suggesting issues with the task or optionality between the overt and null referential subject pronoun in this context. Still, the comparison made in Section 5.3.2.4.3 between the two groups’ average differential RT to the counterbalanced tokens showed no statistically significant difference in the third region of interest, where both groups evidenced the expected distinction. Lastly, the comparisons made in Section 5.3.2.6 showed that distinctions made by the L2 speaker group, albeit more widespread, largely matched the native speaker group’s distinctions. This final point is interesting in that the native speaker group was shown to demonstrate more widespread distinction in the online GJ, but it is the L2 learners that show this in the online CMFT. In sum, evidence suggesting similarities between the two participant groups regarding the processing of the discourse distribution of overt and null referential subjects in Spanish was found in the online version of the CMFT.

In sum, based on the results of the online GJ, the L2 speaker group largely demonstrated native-like processing of the syntactic distribution of overt and null subjects in Spanish. The results regarding the discourse distribution are less straightforward in that the distinctions made by the L2 speaker group described in Section 5.3.2.6 seem to be more widespread in terms of regions of interest than those of the native speaker group. Additionally, as the expected distinction was not made by the native speaker group or the L2 speaker group for the Contrastive Focus or Topic Maintenance tokens, the task may not have been sensitive enough to capture distinctions made by the participants. Recall that the IH predicts differences between native speakers and near-native speakers for the processing of interface-conditioned properties like the discourse distribution of referential subjects. Some support of this prediction was found in the widespread distinctions made between token types. Chapter 6 brings together the offline and online results and examines them in light of the predictions of the IH.
CHAPTER 6
CONCLUSION

6.1 General Introduction

This final chapter offers general conclusions concerning the data presented in Chapter 5, especially in light of the original research questions outlined in Chapter 1. I will argue that certain data provide evidence against the predictions made by the most recent version of the Interface Hypothesis (IH), although the results are not definitive and some results were predicted by the IH. From there, I will discuss the limitations of the study, some of which are methodological in nature. Then, the general implications of the type of research presented in this study will be described with respect to the IH and general L2 acquisition theory. Finally, the chapter closes with a brief conclusion.

6.2 The Research Questions

Chapter 1 briefly described the basics of normal child L1 acquisition, highlighting its ultimate attainment and contrasting this with a very distinct scenario witnessed in adult second language (L2) acquisition: many adult L2 learners do not achieve native-like knowledge of their L2. However, native-like knowledge is attainable and much research has shown that this population converges on a number of properties for which domain-general learning strategies nor frequency can account for (White 2003a, 2011a). These differences and the variable level of attainment reached by adult L2 learners constitute the research problem addressed in this study. A recent proposal that attempts to reconcile some of the noted disparity, the IH, was described. The IH claims that external interface-conditioned properties are more susceptible to divergence due to the presence of two linguistic systems (the first and the second language) in one mind and, consequently, the division of finite cognitive resources that managing these two systems necessitates (Wilson et al. 2009; Sorace 2011). Based on the claims of the latest version of the IH
(Sorace 2011), three research questions (1)-(3) were outlined in Section 1.5 and examined in this dissertation. They are repeated below as (4)-(6):

4. Do near-native L2 learners demonstrate more divergence with respect to external interface-conditioned properties as opposed to purely syntactic ones in offline tasks?

With respect to the first research question (4), participants’ knowledge of the syntactic and discourse distribution of subjects in Spanish was tested in two offline experimental tasks (see Section 4.5.1), the Grammaticality Judgment/Correction Task (GJCT) and the Context-Matching Felicitousness Task (CMFT). Regarding the GJCT, two important findings point to native-like convergence on the part of the L2 speaker group. First, no main effect was found for group and, second, both participant groups distinguished between ungrammatical overt subjects in ESO tokens as compared to grammatical overt subjects in RSO tokens. Thus, it seems that the L2 speaker group has converged upon the syntactic distribution of subjects in Spanish, including the null expletive subject which Karimi (2005) claims does not form part of native Farsi speakers’ grammar. It is worth noting that insofar as Spanish and Farsi differ syntactically in the domain of null subjects, this evidence demonstrates clear acquisition by the L2 speaker group.

Similarly, on the CMFT, no significant difference was found between the native speaker and L2 speaker groups with respect to Contrastive Focus with overt subject (CFO), Contrastive Focus with null subject (CFN) or Topic Shift with overt subject (TSO) tokens. Significant differences were found between the two groups, however, for Topic Shift with null subject (TSN), Topic Maintenance with overt subject (TMO) and Topic Maintenance with null subject (TMN) tokens. Together, these findings echo previous research that found divergence on Topic Shift (Sorace and colleagues) but not Contrastive Focus (Rothman 2009) and show that the L2 speaker group is rather accepting of overt referential subject pronouns in Topic Maintenance contexts despite a preference for null subject pronouns in L1 Farsi and Spanish. In fact, and
differently from the native speaker group, no significant difference was found between the CFO or TSO tokens versus TMO tokens. Despite the seemingly mixed results with respect to the CMFT, another three-way comparison demonstrated that both participant groups made a distinction between overt versus null subjects in each context type. This finding confirms the groups’ differential treatment of overt versus null subjects as a function of each discourse context tested.

Considering these results as a whole, it appears that the L2 speaker group converged on the syntactic distribution of subjects in that native-like distinctions were made between the counterbalanced tokens. The L2 participant group accepted overt and null referential subject pronouns and null expletive subjects while rejecting overt expletive subjects in the GJCT in spite of differences between their native language and the target language. Still, the L2 speaker group showed more mixed results with respect to the discourse distribution of subjects since convergence was found for Contrastive Focus (as in Rothman 2009), but differences were found for Topic Shift (as found by Sorace and colleagues) and Topic Maintenance (where the L2 learners rated both TMO and TMN tokens as “good”). Additionally, they failed to distinguish between the use of overt subjects in CFO versus TMO and TSO versus TMO contexts, rating overt subjects as “good” in all three contexts. This echoes reports of overuse of overt referential subject pronouns (Bini 1993; Margaza & Bel 2006; Sorace & Filiaci 2006; Belletti et al. 2007; Sorace et al. 2009; García-Alcaraz & Bel 2011). Without further investigation, one cannot be sure if these differences are a product of dialect (11 of 24 native speaker participants rated TMO and TMN tokens equally “good”, and two rated more TMO tokens than TMN tokens as “good”) or a product of the task itself. Importantly, the L2 speakers rated more overt subjects than null subjects as “good in the Contrastive Focus and Topic Shift contexts, and rated more null subjects
than overt subjects as “good” in Topic Maintenance contexts. As a whole, these results corroborate data found in previous offline studies examining the distribution and interpretation of pronominal subjects in Romance languages (Lozano 2002; Sorace & Filiaci 2006; Rothman 2008a, 2009; Prada Pérez 2009, 2010; Sorace et al. 2009, and those listed above).

5. Do near-native L2 learners exhibit greater processing difficulties with external interface-conditioned properties as compared to purely syntactic ones in online tasks?

Regarding the second research question, participants’ processing of the syntactic and discourse distribution of subjects in Spanish was tested in two online experimental tasks (see Section 4.5.2). For the online Grammaticality Task (GT), no statistically significant differences were found between the native speaker and L2 speaker group’s treatment of overt subjects as compared to null subjects in referential tokens in either the first, second or third region of interest. In accord with the syntactic literature (Rizzi 1982; Jaeggli & Hyams 1988), no evidence (i.e. slower comparative RTs) was found suggesting that either of the participant groups perceive these tokens as ungrammatical. With respect to the expletive tokens, both participant groups distinguished between ungrammatical overt and grammatical null subjects in the third region of interest. The native speaker group, but not the L2 speaker group, did so as well in the second region of interest. This suggests that the two participant groups detect the ungrammaticality of the ESO tokens, the only difference being that the native speaker group also does so in the second region showing a more widespread distinction between the overt and null subjects. This finding may be interpreted as evidence in favor of the IH as the detection of ungrammaticality is evidenced at the earliest possible point, the verb. This indicates that the native speaker group is faster to process the ungrammaticality. However, the native speaker group’s RTs across both online tasks were in most cases significantly faster than the L2 speaker group’s RT. Thus, the average differential RT between the counterbalanced tokens was calculated and examined
statistically. For these tokens, the comparison of each group’s average differential RT between the ESO versus ESN and the ESO versus RSO tokens showed no statistically significant differences, providing evidence that the L2 speaker group made a native-like distinction between the ungrammatical ESO tokens and the grammatical ESN and RSO tokens.

Regarding the online CMFT, the results are not as clear-cut; neither participant group showed a significant difference between overt and null subjects in either region of interest for the Contrastive Focus tokens. As explained in Section 5.3.3, this likely indicates that the task was unable to capture either participant group’s sensitivity to overt and null subjects in this token type. With respect to the Topic Shift tokens, no statistically significant difference between overt and null subjects in Topic Shift contexts was made by either the native speaker or the L2 speaker group in the second region of interest, but both groups exhibited a statistically significant difference between the two subjects in the third region of interest. Additionally, the comparison of each group’s average differential RT between TSO and TSN tokens produced no statistically significant difference for the second or third regions of interest. Finally, the same result seen for the Contrastive Focus tokens obtained for the Topic Maintenance tokens in that neither group displayed a statistically significant difference between overt and null subjects in either region of interest. As stated above in reference to the Contrastive Focus tokens, this may be a product of the task. Finally, the comparisons made across token types described in Section 5.3.2.6 showed a more widespread distinction on the part of the L2 speaker group, yet the distinctions largely matched those of the native speaker groups.

To conclude, then, the online syntactic data demonstrates more evidence of native-like processing in that neither group distinguished between the RSO and RSN tokens as they are both grammatical, but both groups distinguished between the grammatical ESN tokens and the
ungrammatical ESO tokens in the third region of interest. Additionally, the comparison of each group’s average differential RT between the ESO versus ESN and the ESO versus RSO tokens showed no statistically significant differences. Perhaps partly due to the task’s inability to detect sensitivity to the Contrastive Focus and Topic Maintenance tokens, less convergence is seen with respect to the discourse data since the L2 speaker group showed more temporally widespread detection of differences in the comparison made across context type (see Section 5.3.2.6). This less pinpointed detection differs from that seen in the online GT in that the native speakers showed earlier detection, while the L2 learners show longer-sustained detection. Whether this is a product of processing differences between the native speaker group and the L2 participant group or the task cannot be determined from this data alone.

6. Do near-native L2 learners perform more native-like in offline tasks as compared to online tasks?

Finally, and bearing in mind the data described in answering the two previous research questions, some differences between the two task modalities were found. With respect to the GJCT and the CMFT, both groups distinguished between the counterbalanced tokens, yet only the native speaker group rated TMO tokens significantly differently as compared to CFO and TSO tokens. Regarding the online tasks, one difference obtained with respect to the regions in which the detection of the infelicitous nature of the ESN tokens was found in the online GJ: the native speaker group demonstrated evidence of detection in both the second and third regions of interest, while the L2 speaker group showed evidence of detection in the third region of interest only. Furthermore, the L2 speaker group showed more widespread distinction between context type in the comparisons made in Section 5.3.2.6. While some differences were found in offline and online tasks, it seems that more differences were found in the online tasks, suggesting that
experimental methodologies may affect the results and also that online methodologies may be more sensitive measures.

In summary, the three research questions that were formed with the specific intention of testing the claims of the IH (Sorace 2011) seem to be answered in the positive when the data provided by the two offline and two online experimental tasks in Chapter 5 are considered. The near-native L2 speakers of Spanish demonstrated more divergence with respect to the discourse-conditioned properties in the offline CMFT than the syntactic properties in the GJCT. Similarly, the data from these same learners provided evidence suggesting more processing differences with the discourse distribution of subjects in the online CMFT as compared to the syntactic distribution in the GT, especially with respect to the widespread nature of some of the distinctions the L2 speaker group made. This is not to say, however, that no evidence of native-like performance was found, as certain results from each task do show similarities. Finally, task modality was shown to have an effect on the findings in that more differences were found in the online tasks. While these findings are valuable, this study is not free of shortcomings. The following section discusses some of the limitations of this study.

6.3 Limitations of the Study

To my knowledge, the present study is the first to examine L2 Spanish in the context of Farsi. Notwithstanding, significant populations of Farsi-Spanish bilinguals, especially those that are homogenous in terms of age of first exposure, exposure to the same dialect, maintenance of the L1 and little to no formal instruction, do not exist. Recall, that it was necessary to test near-native speakers as the predictions of the IH apply to this population. These factors have contributed to the relatively low number of L2 speaker participants. An advantage of testing this specific language pairing, however, is that while they share an analogous discourse distribution of subjects, the underlying syntax differs. While this is not a necessary condition in order to test
the IH, it is unique to this study and can provide new insights. Regardless of the language pairing, a larger L2 group is ideal in order to increase the power of the current study. Thus, potential future research includes identifying additional homogenous groups of near-native L2 Spanish speakers that meet these or similar criteria (e.g. Hungarian-Spanish speakers), speakers of language pairings that differ, albeit slightly, with respect to the distribution of referential subject pronouns (e.g. Italian-Spanish) and speakers of language pairings that differ with respect to the Null Subject Parameter (e.g. English-Spanish).

It could be claimed that a further limitation of the study is the examination of critical properties (i.e. the discourse distribution) for which the native and L2 of the bilingual participants do not differ. Recall from Chapter 3 that Spanish and Farsi are both syntax-discourse configurational null subject languages that permit overt and null referential subjects (Rigau 1986, 1988; Luján 1987, 1999; Fernández-Soriano 1989, 1993; Picallo 1994, 1998; Karimi 2005) and that the participants of Judy and Feizmohammadpour (2012) showed the same discourse distribution of subjects in Farsi as shown in Rothman (2009) for Spanish. While this parallel behavior across Spanish and Farsi may at first seem to undermine the results described in Chapter 5 under the assumption that convergence on these properties in Spanish is possible through simple L1 transfer, it is in fact important for the goals of the study. Recall that the IH (Sorace 2011) alleges that interface vulnerability obtains as a byproduct of the managing of two grammars in one mind and, importantly, not as a consequence of language-specific differences (parametric, semantic, discourse or otherwise). With exceptions like Bini (1993), Lozano (2002, 2006), Belletti and Leonini (2004), Margaza and Bel (2006), Sorace et al. (2009), Serratrice et al. (2009), Prada Pérez (2009, 2010) and García-Alcaraz & Bel (2011), many studies examining the IH (directly or indirectly) have done so in language pairings for which the two languages differ.
(for example Hertel 2003; Tsimpli et al. 2004; Gürel 2006; Sorace & Filiaci 2006; Valenzuela 2006; Belletti et al. 2007; Domínguez 2007; Iverson et al. 2008; Rothman 2008a, 2009; Ivanov 2009; Donaldson 2011a, 2011b; Slabakova et al. 2012). Consequently, it is important to test the IH’s claims in languages that do not differ with respect to the properties tested, like those cited above. Sorace (2011) discusses some preliminary data showing that, despite similarities across Spanish and Italian, such bilinguals are not immune to the overuse of overt subjects. From these data, Sorace claims that it is precisely their status as bilinguals and its consequences on resource allocation that explains this finding. The present language pairing, thus, follows the same logic while innovating since Farsi and Spanish, unlike Spanish and Italian, are not typologically similar languages nor have they been studied in light of each other before. Nonetheless, a limitation of the present study is that the findings could have been bolstered by either examining an additional near-native L2 Spanish-speaking population whose L1 is a non-null subject language, or by concurrently examining an additional linguistic property for which Farsi and Spanish differ. Doing so would allow us to tease apart the potential effect of the analogous nature of the discourse distribution of referential subject pronouns in Farsi in Spanish. First, if divergence were to be found for the same properties across the same tasks employed herein by non-null subject language speakers (e.g. English), this would provide evidence that language pairing has an effect on convergence, which was also found in Lozano (2002), Serratrice et al. (2004) and Serratrice et al. (2009). Second, if divergence was found in the same population of native Farsi-speaking, near-native L2 Spanish speakers studied herein for a property for which Farsi and Spanish differ, this result would also point to language pairing as a factor that affects convergence. To test this scenario, convergence on the distribution of Differential Object
Marking (DOM) could be examined in the same population as DOM distribution is more restricted in Farsi than in Spanish.

Finally, some methodological limitations will be discussed. First, Section 3.2.3 outlined the learning task of the native speakers of Farsi with respect to their convergence on the syntax of Spanish subjects. Native Farsi speakers must converge on the fact that Spanish does not allow all phrasal elements to remain in the vP and that Spanish is not a verb-final language. Therefore, while nominative case on the subject can be checked and valued in Spec,vP in Farsi and the EPP is satisfied morphologically without movement, nominative case is checked and valued in Spec,TP and the EPP is satisfied via V-to-T movement in Spanish. Finally, Farsi speakers learning Spanish must acquire expletives according to Karimi (2005). A potential way of determining whether or not the L2 speaker group has converged on the syntax of Spanish subjects is by testing for knowledge of restrictions on adverbial placement (which demarcate the VP boundary). However, since these token types were not included in the methodology, no definitive claims can be made regarding their underlying syntax. I leave this to future research.

Second, and with respect to the online CMFT, an unexpected result obtained for the Contrastive Focus and Topic Maintenance tokens in that neither the native speaker nor the L2 speaker group was found to distinguish to a significant degree between the use of overt or null subjects in these two contexts. However, they made the distinction for Topic Shift tokens. Recall that a distinction between the two subject types was predicted if infelicitousness was detected. Therefore, the fact that the native speakers did not make the expected distinction could point to the CMFT’s inability to capture the participants’ sensitivity to the Contrastive Focus and Topic Maintenance tokens, or possibly the need to reevaluate what is to be considered the expected result. However, the offline task showed that both groups distinguished between CFO and CFN
tokens, the TSO and TSN tokens and the TMO and TMN tokens, but that the L2 speaker group rated the TSN, the TMO and the TMN tokens as significantly better than did the native speaker group. This unexpectedly high rating of TSN tokens could result from the L2 speaker group using context and intuition in order to make meaning of the sentence, including the subject of the verb in question. While this is also possible with respect Contrastive Focus tokens, there seems to be less necessity for overt subjects in Topic Shift contexts than in Contrastive Focus contexts (Silva-Corvalán 1982, 1994; Enríquez 1984; Bentivoglio 1987; Bayley & Pease-Álvarez 1996, 1997; Otteguy et al. 2007; Prada Pérez 2009; Lapidus & Shin 2012). Future research should not only attempt to remedy these limitations, but also explore the differences between these context types.

Third, the online measure employed in this study was a self-paced reading task (SPRT). A limitation of SPRTs is that, while this task gathers RT data for the regions of interest, this measurement is not as fine-grained as other tasks used to examine processing, such as eye-tracking or ERP methodology. Future research may expand on the present study by employing such methodologies and, importantly, by comparing the results found across methodologies to determine the effect of the modality of testing.

Fourth, some syntactic differences between Farsi and Spanish were discussed in Section 3.2.1, one of those being that Farsi optionally allows *in* “this” in subject position. Karimi (2005) claims that *in* is a demonstrative; thus, the Spanish equivalent, *este* “this”, could have been used as the ungrammatical overt expletive subject to more closely match the Farsi demonstrative. However, a major drawback of this option is that *este* is frequently used hesitation disfluency or filler (much like “um” or “er” in English) in Argentine Spanish. Research has shown that such hesitations affect language processing in spoken speech (Corley & Stewart 2008; Corley,
MacGregor & Donaldson 2007) and that they can also affect grammaticality ratings assigned to
garden path sentences in offline tasks (Bailey & Ferreira 2003). To avoid these potential effects, 
*ello*, which is not used as a hesitation, was used instead.

Finally, the proficiency measure employed herein, the Diplomas del Español como 
*Lengua Extranjera* (DELE 2002), is commonly used in Spanish L2 acquisition studies; however, 
this measure may not be able to capture fine-grained differences in the proficiency levels of such 
highly fluent L2 speakers as those examined herein. That is, while all L2 speaker participants 
tested at the near-native level, it could be the case that these participants’ proficiency level is 
behind what the DELE can measure. It is possible that a more sophisticated proficiency test may reveal differences between the native and L2 speaker groups, and also between the L2 speaker 
participants themselves. If so, subtle differences may be found, based on the fine-grained 
proficiency levels, in the L2 speakers’ convergence and processing of the properties tested 
herein, perhaps showing a gradual path of convergence. This hypothesis could be tested by 
employing more sophisticated proficiency measures and also by examining and comparing the 
L2 acquisition of speakers with varying numbers of years of exposure to the L2 (e.g. 5 years, 10 
years, 15 years, etc.).

### 6.4 Implications for the Interface Hypothesis and SLA Theory

In recent years, the IH has undergone two key clarifications (Sorace 2011, 2012). First, 
the original claim that interface-conditioned properties (both internal and external) were more 
susceptible to divergence in near-native grammars than purely syntactic properties was modified 
to isolate only external interfaces after research showing convergence on syntax-semantic 
properties was provided (see work cited in Tsimpili & Sorace 2006; Slabakova 2006, 2008; 
White 2008; Rothman & Slabakova 2011 ao.). Second, this revised version was subsequently 
clarified in response to data demonstrating convergence on external interface-conditioned
properties examined via offline methodology, ultimately leading Sorace to claim that only properties dependent on the external interfaces are subject to vulnerability as regards their processing (i.e. this vulnerability should ideally be tested using online methodology). As discussed in Section 2.3.6, the vast majority of the adult acquisition studies testing the claims of the IH combine a Germanic language (usually English) with a Romance language (usually French, Italian or Spanish) alternating as the first or second language of the participants. Very few studies combine a non-Germanic, non-Romance language as one of the languages (but see Tsimpli & Sorace 2006). Related to this point is the fact that many studies, as described in Section 6.3, examine convergence on a property for which the L1 and L2 differ. Thus, if divergence is found, this may very well be a question of grammatical restructuring, not of processing differences between native and non-native speakers. Differences on interface-conditioned properties could also be a product of different working memory or inhibitory control capacities. To avoid this conflation of variables, researchers can and should determine native-like knowledge of the related syntax of the interface-conditioned property tested. Nonetheless, as Rothman and Slabakova (2011) encourage, a variety of language pairings must be examined while testing the predictions of the IH in order for the results to be generalizable. That is, if we are to take seriously the claim that the presence of two grammars ultimately causes processing differences with external interface-conditioned properties, evidence for this claim needs be provided from a variety of language pairings and linguistic properties. Specifically, an array of linguistic properties for which the L1 and L2 do not differ, either on the surface or at the representational level, must be examined. Doing so may shed light on the IH’s claims, forcing an even more restricted set of predictions with respect to where divergence is expected.
The current study contributes to this body of research in that the languages examined are both null subject languages with analogous discourse-conditioned distributions of subject pronouns. Against the predictions of the IH, the results showed convergence on certain aspects of the discourse distribution of subjects across offline (specifically with respect to the Contrastive Focus tokens, an external-interface conditioned property) and online experimental tasks (specifically regarding the Topic Shift tokens). If, as the IH claims, processing differences obtain as the result of the division of finite cognitive resources in bilingual’s brains, divergence is expected on all discourse-conditioned properties. This is not to minimize the differences that were found, but rather to point out that across-the-board divergence was not found. Considering this result with previous research examining the predictions of the IH, further modification may be warranted. More precisely, these modifications may require the IH’s claims to be narrowed down and may specifically involve changes regarding the types of properties for which divergence is predicted, the particular methodological designs to be used in testing its claims and/or the language pairings tested. For instance, it could the case that certain external-interface conditioned properties—perhaps Topic Shift as Tsimpli and Sorace (2006) and Sorace et al. (2009) seem to support, but not all, are more vulnerable to divergence (see for example Iverson et al. 2008; Hopp 2009; Ivanov 2009; Prada Pérez 2009, 2010; Bohnacker 2010; Donaldson 2011a, 2011b; Slabakova et al. 2012). It could also be the case that the subtleties of processing differences between native speakers and near-native speakers, as claimed by the IH, can only be captured via particular methodologies, such as eye-tracking, thus explaining the convergence seen in the abovementioned studies that report convergence in offline tasks. Finally, language pairing may come to bear on convergence on processing in that near-native L2 learners whose L1 matches the L2 for the property tested may demonstrate more native-like processing in the L2
than those whose L1 differs from the L2 as discussed above. It would be particularly interesting to test the same group of near-native speakers on one property for which the L1 and L2 match and on one property for which they differ, the distribution of referential subject pronouns and DOM being good candidates for this type of study. Of course, future research testing various properties across various language pairings and using different online methodologies will guide these modifications and I certainly do not mean to suggest that the IH must be modified based on the findings of one study.

6.5 Conclusion

This dissertation study examined L1 Farsi speakers who are near-native L2 Spanish speakers regarding their knowledge and processing of two properties related to subjects in Spanish in light of the predictions of the IH (Sorace 2011). Namely, the distribution of referential and expletive subjects as well as the discourse-conditioned distribution of referential subject pronouns were tested across four experimental tasks. The offline GJCT tested for knowledge of the syntactic distribution of subjects and the CMFT tested for knowledge of the discourse-conditioned distribution of subjects in Spanish. Evidence of native-like knowledge was demonstrated on both offline tasks; however, as in previous work by Sorace and colleagues, the L2 speaker group differed from the native speaker group with respect to their ratings of TSN, TMO and TMN tokens and they rated TMO tokens similarly to CFO and TSO tokens showing an overuse of overt subjects in Topic Maintenance contexts (in line with Bini 1993; Margaza & Bel 2006; Sorace & Filiaci 2006; Belletti et al. 2007; Sorace et al. 2009; García-Alcaraz & Bel 2011). Since the same participants did not differ with respect to their ratings of the CFO or CFN tokens (as in Rothman 2009), these findings may point to differential levels of difficulty in external-interface conditioned properties (at least when examined in offline tasks) and call for reassessment of the properties on which near-native L2 speakers are expected to demonstrate
processing differences. Finally, a complementary online version of each offline experimental task was employed via a SPRT in E-prime. While the L2 speaker group demonstrated slower overall RTs in all regions of interest across both tasks, some evidence showing native-like processing of these linguistic properties was found. Importantly, no differences between the native speaker and L2 speaker group were found for the average differential RT to the counterbalanced Topic Shift tokens in either the second or third region of interest, demonstrating that even with a potentially more sensitive measure (i.e. online measure, see Section 6.2), the L2 speaker group detected the infelicity of the TSN tokens.
APPENDIX A
OFFLINE GRAMMATICALITY JUDGMENT/CORRECTION TASK

A.1 Referential Subject Tokens

A.1.1 Referential Subject Overt (RSO)

En mi opinión él toma muchas clases en esta academia.
En mi opinión ella come muchos dulces durante el verano.
En mi opinión él hace muchos comentarios durante el taller.
Según sus hermanos ella toma muchas pastillas por la noche.
Según sus enfermeras él come muchos vegetales por la tarde.
Según su maestra ella hace muchas críticas en esta asignatura.

A.1.2 Referential Subject Null (RSN)

En mi opinión siempre toma muchas vitaminas por la mañana.
En mi opinión siempre come muchos postres durante el invierno.
En mi opinión siempre hace muchas consultas en este negocio.
Según sus docentes siempre toma muchos cursos en este instituto.
Según sus hermanos siempre come muchas golosinas por la noche.
Según los alumnos siempre hace muchas preguntas durante la clase.

A.2 Expletive Subject Tokens

A.2.1 Expletive Subject Overt (ESO)

Mi abuela dice que ello llueve mucho en la primavera.
La locutora dice que ello nieva mucho en las montañas.
El meteorólogo dice que ello llovizna mucho en el sur.
La doctora dice que ello llueve mucho en el verano.
Mi hermano dice que ello nieva mucho en ese estado.
Mi papá dice que ello llovizna mucho en esa ciudad.

A.2.2 Expletive Subject Null (ESN)

Los vecinos dicen que siempre llueve mucho en esa región.
Mis primas dicen que siempre nieva mucho en esa provincia.
Mis abuelos dicen que siempre llovizna mucho en el otoño.
Mis amigas dicen que siempre llueve mucho en la costa.
Las profesoras dicen que siempre nieva mucho en las sierras.
Los expertos dicen que siempre llovizna mucho en el invierno.

A.3 Differential Object Marking (DOM) Tokens

A.3.1 +specific, +animate, +indicative with DOM

El docente busca a un chico que hace bien el trabajo.
La chica prefiere a un chico que toca bien la guitarra.
El director desea a un chico que canta bien la música.
La vecina busca a un chico que hace bien el laburo.
El cantante desea a un chico que toca bien el bajo.
El hombre prefiere a un chico que canta bien la letra.

A.3.2 +specific, +animate, +indicative without DOM

La maestra busca un chico que hace bien la tarea.
El compositor desea un chico que toca bien el acorde.
El músico busca un chico que canta bien la estrofa.
La jefa prefiere un chico que hace bien la investigación.
La clienta prefiere un chico que toca bien el piano.
El guitarrista desea un chico que canta bien el coro.

A.3.3 +specific, -animate, +indicative with DOM

La abogada busca a un libro que describa bien la legislación.
El intelectual desea a un libro que explica bien la teoría.
El economista busca a un libro que define bien el mercado.
El viajero desea a un libro que describe bien la región.
El jugador prefiere a un libro que explica bien el objetivo.
El instructor prefiere a un libro que define bien la técnica.

A.3.4 +specific, -animate, +indicative without DOM

El filósofo busca un libro que describe bien la cuestión.
El ingeniero desea un libro que explica bien la industria.
El técnico prefiere un libro que define bien la estrategia.
La chica prefiere un libro que describe bien la materia.
La mujer busca un libro que explica bien la historia.
El director desea un libro que define bien el problema.

A.3.5 -specific, +animate, +subjunctive with DOM

La maestra busca a un chico que haga bien la tarea.
El compositor desea a un chico que toque bien el clarinete.
La adolescente prefiere a un chico que cante bien la canción.
El hombre busca a un chico que haga bien el trabajo.
El concertista prefiere a un chico que toque bien el oboe.
El guitarrista desea a un chico que cante bien el tema.

A.3.6 -specific, +animate, +subjunctive without DOM

El docente busca a un chico que haga bien el ensayo.
La chica prefiere a un chico que toque bien la batería.
El director desea a un chico que cante bien el himno.
La abuela busca un chico que haga bien el mandado.
El baterista desea un chico que toque bien la corneta.
El maestro prefiere un chico que cante bien la balada.

A.3.7 -specific, -animate, +subjunctive with DOM

El profesor busca a un libro que describa bien el punto.
La estudiante prefiere a un libro que explique bien la idea.
El científico desea a un libro que defina bien la hipótesis.
La mujer busca a un libro que describa bien la tradición.
El presidente prefiere a un libro que defina bien el asunto.
El bajista desea a un libro que explique bien el instrumento.

A.3.8 -specific, -animate, +subjunctive without DOM

El filósofo busca un libro que describa bien el argumento.
El chico prefiere un libro que explique bien la leyenda.
El investigador desea un libro que defina bien la fórmula.
El gerente busca un libro que describa bien el negocio.
El empleado prefiere un libro que explique bien el sistema.
El detective desea un libro que defina bien el método.

A.3.9 CLLD with +definite DO with DOM

Los colegas vieron el tubo, pero a la bióloga no la vieron ayer en el laboratorio.
Los niños vieron el globo, pero a la payasa no la vieron ayer en el carnaval.
Los espectadores vieron el tutú, pero a la bailarina no la vieron ayer en el teatro.
Los pasajeros vieron el uniforme, pero a la azafata no la vieron ayer en el avión.
Los muchachos vieron el vaso, pero a la florista no la vieron ayer en la florería.
Los coleccionistas vieron el pincel, pero a la pintora no la vieron ayer en el estudio.

A.3.10 CLLD with +definite DO without DOM

Los practicantes vieron el rosario, pero a la monja no la vieron ayer en la iglesia.
Los admiradores vieron el lápiz, pero a la autora no la vieron ayer en la librería.
Los clientes vieron el espejo, pero a la peluquera no la vieron ayer en la peluquería.
Los diseñadores vieron el vestido, pero a la modelo no la vieron ayer en el probador.
Los banqueros vieron el recibo, pero a la cajera no la vieron ayer en el pasillo.
Los actores vieron el guión, pero a la actriz no la vieron ayer en el escenario.

A.3.11 CLLD with +indefinite DO with DOM

Los colegas vieron un tubo, pero a una bióloga no la vieron ayer en el laboratorio.
Los niños vieron un globo, pero a una payasa no la vieron ayer en el carnaval.
Los espectadores vieron un tutú, pero a una bailarina no la vieron ayer en el teatro.
Los pasajeros vieron un uniforme, pero a una azafata no la vieron ayer en el avión.
Los muchachos vieron un vaso, pero a una florista no la vieron ayer en la florería.
Los coleccionistas vieron un pincel, pero a una pintora no la vieron ayer en el estudio.

A.3.12 CLLD with +indefinite DO without DOM

Los practicantes vieron un rosario, pero una monja no la vieron ayer en la iglesia.
Los admiradores vieron un lápiz, pero una autora no la vieron ayer en la librería.
Los clientes vieron un espejo, pero una peluquera no la vieron ayer en la peluquería.
Los diseñadores vieron un vestido, pero una modelo no la vieron ayer en el probador.
Los banqueros vieron un recibo, pero una cajera no la vieron ayer en el pasillo.
Los actores vieron un guión, pero una actriz no la vieron ayer en el escenario.

A.4 Agreement Filler Tokens

A.4.1 Subject-Verb Agreement Fillers

Las princesas ricas compró muchas decoraciones de la mueblería.
Las actrices maleducadas tomó muchas cervezas en la celebración.
Las secretarias perezosas leyó muchas revistas en la oficina.
Las mamás embarazadas comió muchos chocolates por la tarde.
Las artistas jóvenes pintó muchos cuadros para la exhibición.
Los financieros listos vendieron muchas propiedades el año pasado.

A.4.2 Noun-Adjective Agreement Fillers

Los políticos corrupto aceptaron muchos sobornos la semana pasada.
Los diplomáticos refinado leyeron muchos documentos para la reunión.
Los bomberos nuevo recibieron muchas llamadas durante la noche.
Los soldados fuerte levantaron muchas pesas durante el entrenamiento.
APPENDIX B
OFFLINE CONTEXT-MATCHING FELICITOUSNESS TASK

B.1 Contrastive Focus with Overt Subjects (CFO)

Cuando salimos a cenar, mi novia prefiere comer platos livianos pero yo prefiero comer algo sustancioso.

Así que ella come ensaladas y yo como milanesas en los restaurantes.

Cuando cenamos en casa, mi esposa prefiere preparar el postre, pero yo prefiero cocinar el plato principal.

Así que ella hace alfajores y yo hago milanesas para la cena.

Cuando preparamos la cena, mi hermana prefiere preparar los entremeses, pero yo prefiero preparar la carne.

Así que ella prepara empanadas y yo preparo milanesas para la cena.

Cuando trabajamos en la librería, mi colega prefiere estar en la sección de cultura actual, pero yo prefiero la de libros.

Así que ella vende revistas y yo vendo novelas en la librería.

Cuando escribimos sobre la historia del país, mi compañera prefiere contar relatos cortos, pero yo prefiero contar relatos largos.

Así que ella escribe cuentos y yo escribo novelas para la editorial.

Cuando estamos de vacaciones, mi prima prefiere leer algo corto, pero yo prefiero leer algo muy denso y largo.

Así que ella lee poemas y yo leo novelas durante las vacaciones.

B.2 Contrastive Focus with Null Subjects (CFN)

Cuando merendamos por la tarde, mi compañera prefiere tomar algo frío, pero yo prefiero tomar algo caliente.

Así que toma agua y tomo mate con la merienda.
Cuando hablamos con los invitados, mi esposa prefiere su propia bebida, pero yo prefiero compartir una bebida con ellos.

Así que ofrece café y ofrezco mate después de la cena.

Cuando hacemos picnic con nuestros amigos, mi novia prefiere llevar algo dulce, pero yo prefiero llevar una bebida.

Así que lleva postres y llevo mate a los picnics.

Cuando vamos a exposiciones de arte, mi colega prefiere ver artes plásticas, pero yo prefiero ver cuadros.

Al final compra esculturas y compro retratos en las exposiciones.

Cuando vamos a la clase de pintura, mi sobrina prefiere pintar la naturaleza, pero yo prefiero retratar a personas.

Así que pinta paisajes y pinto retratos en la clase.

Cuando vamos al estudio de arte, mi amiga prefiere dibujar otras cosas, pero yo prefiero dibujar a personas.

Así que dibuja figuras y dibujo retratos en el estudio.

**B.3 Topic Shift with Overt Subjects (TSO)**

Mi vecina es muy quisquillosa en cuanto a la comida y solo come ensaladas. Yo le preparo muchos platos ricos y se los llevo, pero no importa lo que haga yo.

Finalmente ella come ensaladas y no prueba otras comidas nunca.

Mi suegra es buena cocinera, pero no acepta los gustos de los demás. Yo no como dulces ya que estoy a dieta y prefiero comer comidas sanas.

No obstante ella hace alfajores y viene a mi casa para compartirlos.

Mi nuera sabe cocinar muchas cosas ya que estudia la gastronomía. Yo no quiero comer más platos argentinos sino que prefiero probar platos nuevos y se lo digo.

Sin embargo ella prepara empanadas e ignora mis pedidos gastronómicos.
Mi hermana tenía un puesto de golosinas pero no ganaba mucho dinero. Yo sé que sería mejor vender varios productos y sugerí revistas y periódicos.

Hoy en día ella vende revistas y gana más plata que antes.

Mi hija quiere ser autora y no tiene otros intereses. Yo creo que es mejor tener varios intereses y sugiero otras actividades, pero no importa lo que diga yo.

Finalmente ella escribe cuentos y pasa todo el día en su cuarto.

Mi compañera de clase nunca estudia para los exámenes ya que prefiere relajarse. Yo soy una persona muy nerviosa así que siempre estudio y repaso toda la materia.

Sin embargo ella lee poemas y deja el estudio para otro día.

**B.4 Topic Shift with Null Subjects (TSN)**

Mi amiga es adicta a la cafeína y por eso no duerme bien por la noche. Yo no tengo ese problema ya que no tomo café y evito totalmente la cafeína.

No obstante toma café y está despierta toda la noche.

Mi esposa está obsesionada con la salud y cambió totalmente el desayuno. Yo no entiendo por qué tantos cambios y solo quiero comer medialunas con chocolate.

Sin embargo ofrece agua y sirve fruta para el desayuno.

Mi abuela es muy golosa y siempre hace postres para las reuniones familiares. Yo soy diabético y no puedo comer los dulces. Igual, no importa lo que diga yo.

Finalmente lleva postres e ignora mis restricciones dietéticas.

Mi vecina es coleccionista de arte y es fanática de las artes plásticas. Yo soy vendedor de arte y por eso sé que es más barato colectar pinturas y se lo digo.

No obstante compra esculturas y gasta mucho dinero en sus compras.

Mi nuera se dedica al arte y puede pintar de todo. Yo creo que sería más lucrativo pintar retratos y sugiero eso mismo. Igual, no importa lo que diga yo.

Finalmente pinta paisajes y vende sus obras por poco dinero.
Mi hija no estudia bien en casa ya que se distrae fácilmente. Yo sé que es difícil y por eso intento eliminar distracciones. Igual, no importa lo que haga yo.

Finalmente dibuja figuras y mira los árboles por la ventana.

**B.5 Topic Maintenance with Overt Subjects (TMO)**

El año pasado mi mamá estaba muy estresada y comía de todo. Ahora quiere bajar de peso para sentirse mejor.

Así que ella come ensaladas y ella hace ejercicio por la mañana.

El semestre pasado, mi amiga hizo un curso de cocina y aprendió muchas cosas. Ahora quiere mostrar sus talentos.

Así que ella hace alfajores y ella reparte todo entre sus amigos.

Ayer mi vecina encontró su receta de empanadas favorita que había perdido hace tiempo. No trabaja esta semana.

Así que ella prepara empanadas y ella comparte todo con el vecindario.

Mi nieta quiere ganar plata para un viaje escolar. Hace unos meses se postuló para un puesto en un kiosco y ya empezó a trabajar.

Así que ella vende revistas y ella ahorra sus ingresos para el viaje.

Mi profesora hizo un curso de escritura. Estudió varios géneros y aprendió mucho. Ahora quiere mostrar sus talentos.

Así que ella escribe cuentos y ella comparte sus historias con los estudiantes.

Mi jefa está muy estresada con el trabajo. No quiere sentirse tan estresada y por eso buscó formas de relajarse.

Así que ella lee poemas y ella escucha música relajante en su oficina.

**B.6 Topic Maintenance with Null Subjects (TMN)**

Últimamente, mi abuela no se siente muy bien. Tiene mucha sed, tiene dolor de cabeza y se cansa fácilmente.
Así que toma agua y descansa un rato antes de salir.

Mi suegra es muy detallista. Cuando tiene cenas en casa, no se olvida de nada y hace todo a la perfección.

Por ejemplo ofrece café y pone música después de cenar.

Mi cuñada es muy sociable. Tiene muchos amigos y por eso va a muchas cenas a la canasta donde tiene que contribuir algo.

Así que lleva postres y comparte todo con sus amigos.

Mi hermana acaba de comprarse una casa. Quiere decorar la casa pero dice que no quiere colgar muchos cuadros.

Así que compra esculturas y decora la casa de forma moderna.

Mi tía es artista profesional y pasa mucho tiempo en el campo. Se inspira mucho allá y suele retratar el entorno en sus obras.

Así que pinta paisajes y vende sus obras en la ciudad.

Mi prima es artista y también participa en la política. Quiere juntar las dos cosas e incorporar sus ideas en sus obras.

ASÍ QUE DIBUJA FIGURAS Y ESCRIBE MENSAJES SOBRE LAS OBRAS.
C.1 Referential Subject Tokens

C.1.1 Referential Subject with Overt (RSO)

En mi opinión ella toma muchas vitaminas por la mañana. ¿Toma muchas vitaminas por la noche?

En mi opinión él come muchos postres durante el invierno. ¿Come muchos postres durante el invierno?

En mi opinión él hace muchas consultas en este negocio. ¿Hace pocas consultas en este negocio?

Según sus docentes ella toma muchos cursos en este instituto. ¿Toma muchos cursos en este instituto?

Según sus hermanos ella come muchas golosinas por la noche. ¿Come muchas golosinas por la tarde?

Según los alumnos él hace muchas preguntas durante la clase. ¿Hace muchas preguntas durante la clase?

C.1.2 Referential Subject with Null (RSN)

En mi opinión siempre toma muchas clases en esta academia. ¿Toma muchas clases en esta academia?

En mi opinión siempre come muchos dulces durante el verano. ¿Come muchas frutas durante el verano?

En mi opinión siempre hace muchos comentarios durante el taller. ¿Hace muchos comentarios durante el taller?

Según sus hermanos siempre toma muchas pastillas por la noche. ¿Toma muchas pastillas por la noche?

Según sus enfermeras siempre come muchos vegetales por la tarde. ¿Come muchos vegetales por la tarde?

Según su maestra siempre hace muchos críticos en esta asignatura. ¿Hace pocos críticos en esta asignatura?
C.2 Expletive Subject Tokens

C.2.1 Expletive Subject with Overt (ESO)

Los vecinos dicen que ello llueve mucho en esa región. ¿Dicen que llueve mucho en esta región?

Mis primas dicen que ello nieva mucho en esa provincia. ¿Dicen que llueve mucho en esa provincia?

Mis abuelos dicen que ello llovizna mucho en el otoño. ¿Dicen que llueve mucho en el otoño?

Mis amigas dicen que ello llueve mucho en la costa. ¿Dicen que nunca llueve en la costa?

Las profesoras dicen que ello nieva mucho en las sierras. ¿Dicen que nieva mucho en las sierras?

Los expertos dicen que ello llovizna mucho en el invierno. ¿Dicen que nunca llovizna en el invierno?

C.2.2 Expletive Subject Tokens with Null Subjects (ESN)

Mi abuela dice que siempre llueve mucho en la primavera. ¿Dice que nieva mucho en la primavera?

La locutora dice que siempre nieva mucho en las montañas. ¿Dice que siempre nieva en las montañas?

El meteorólogo dice que siempre llovizna mucho en el sur. ¿Dice que nunca llueve en el sur?

La doctora dice que siempre llueve mucho en el verano. ¿Dice que siempre llueve en el verano?

Mi hermano dice que siempre nieva mucho en ese estado. ¿Dice que nieva mucho en ese país?

Mi papá dice que siempre llovizna mucho en esa ciudad. ¿Dice que llovizna mucho en esa ciudad?

C.3 Differential Object Marking (DOM) Tokens

C.3.1 +specific, +animate, +indicative with DOM

La maestra busca a un chico que hace bien la tarea.
¿Busca a un chico que hace bien la tarea?

El compositor desea a un chico que toca bien el acorde.
¿Desea a un chico que toca bien el acorde?

El músico busca a un chico que canta bien la estrofa.
¿Busca a un hombre que canta bien la estrofa?

La jefa prefiere a un chico que hace bien la investigación.
¿Prefiere a un chico que hace bien la investigación?

La clienta prefiere a un chico que toca bien el piano.
¿Prefiere a un chico que toca bien la guitarra?

El guitarrista desea a un chico que canta bien el coro.
¿Desea a un chico que canta bien la balada?

**C.3.2 +specific, +animate, +indicative without DOM**

El docente busca un chico que hace bien el trabajo.
¿Busca a un hombre que hace bien el trabajo?

La chica prefiere un chico que toca bien la guitarra.
¿Prefiere a un chico que toca bien la guitarra?

El director desea a un chico que canta bien la música.
¿Desea a un chico que canta bien la música?

La vecina busca a un chico que hace bien el laburo.
¿Busca a un chico que hace bien el laburo?

El cantante desea a un chico que toca bien el bajo.
¿Desea a un chico que toca bien la batería?

El hombre prefiere a un chico que canta bien la letra.
¿Prefiere a un chico que toca bien la letra?

**C.3.3 +specific, -animate, +indicative with DOM**

El filósofo busca a un libro que describe bien la cuestión.
¿Busca un libro que describe bien la cuestión?

El ingeniero desea a un libro que explica bien la industria.
¿Desea un libro que explica bien la industria?

El técnico prefiere a un libro que define bien la estrategia.
¿Prefiere un libro que define bien la estrategia?
La chica prefiere a un libro que describe bien la materia. ¿Prefiere un libro que describe bien la tarea?

La mujer busca a un libro que explica bien la historia. ¿Busca un video que explica bien la historia?

El director desea a un libro que define bien el problema. ¿Desea un video que define bien el problema?

C.3.4 +specific, -animate, +indicative without DOM

La abogada busca un libro que describe bien la legislación. ¿Prefiere un libro que define bien la técnica?

El intelectual desea un libro que explica bien la teoría. ¿Desea un libro que explica bien la teoría?

El economista busca un libro que define bien el mercado. ¿Busca un libro que define bien el mercado?

El viajero desea un libro que describe bien la región. ¿Desea un libro que describe bien el juego?

El jugador prefiere un libro que explica bien el objetivo. ¿Prefiere un libro que define bien la estrategia?

El instructor prefiere un libro que define bien la técnica. ¿Prefiere un panfleto que describe bien la legislación?

C.3.5 +specific, +animate, +subjunctive with DOM

El docente busca a un chico que haga bien el ensayo. ¿Busca un chico que haga bien el ensayo?

La chica prefiere a un chico que toque bien la batería. ¿Prefiere un chico que toque bien la batería?

El director desea a un chico que cante bien el himno. ¿Desea un chico que cante bien el himno?

La abuela busca a un chico que haga bien el mandado. ¿Busca un hombre que haga bien el mandado?

El baterista desea a un chico que toque bien la corneta. ¿Desea un chico que toque bien el saxofón?
El maestro prefiere a un chico que cante bien la balada. ¿Prefiere un chico que toque bien la balada?

C.3.6 -specific, +animate, +subjunctive without DOM

La maestra busca un chico que haga bien la tarea. ¿Busca un chico que haga bien la tarea?

El compositor desea un chico que toque bien el clarinete. ¿Desea un chico que toque bien el clarinete?

La adolescente prefiere un chico que cante bien la canción. ¿Prefiere un chico que cante bien la canción?

El hombre busca un chico que haga bien el trabajo. ¿Busca una chica que haga bien el trabajo?

El concertista prefiere un chico que toque bien el oboe. ¿Prefiere un chico que toque bien la flauta?

El guitarrista desea un chico que cante bien el tema. ¿Desea un chico que cante bien el coro?

C.3.7 -specific, -animate, +subjunctive with DOM

El filósofo busca a un libro que describa bien el argumento. ¿Busca un libro que describa bien el argumento?

El chico prefiere a un libro que explique bien la leyenda. ¿Prefiere un libro que explique bien la leyenda?

El investigador desea a un libro que defina bien la fórmula. ¿Desea un libro que defina bien la fórmula?

El gerente busca a un libro que describa bien el negocio. ¿Busca un libro que describa bien el asunto?

El empleado prefiere a un libro que explique bien el sistema. ¿Prefiere un panfleto que explique bien el sistema?

El detective desea a un libro que defina bien el método. ¿Desea un libro que muestre bien el método?

C.3.8 -specific, -animate, +subjunctive without DOM

El profesor busca un libro que describa bien el punto. ¿Busca un libro que describa bien el punto?
La estudiante prefiere un libro que explique bien la idea. ¿Prefiere un libro que explique bien la idea?

El científico desea un libro que defina bien la hipótesis. ¿Desea un libro que defina bien la hipótesis?

La mujer busca un libro que describa bien la tradición. ¿Busca un libro que describa bien el negocio?

El presidente prefiere un libro que defina bien el asunto. ¿Prefiere un libro que describa bien el asunto?

El bajista desea un libro que explique bien el instrumento. ¿Desea un video que explique bien el instrumento?

**C.3.9 CLLD with +definite DO with DOM**

Los practicantes vieron el rosario, pero a la monja no la vieron ayer en la iglesia. ¿El rosario estuvo en la calle?

Los admiradores vieron el lápiz, pero a la autora no la vieron ayer en la librería. ¿El lápiz estuvo en la biblioteca?

Los clientes vieron el espejo, pero a la peluquera no la vieron ayer en la peluquería. ¿El espejo estuvo en la silla?

Los diseñadores vieron el vestido, pero a la modelo no la vieron ayer en el probador. ¿Vieron el vestido?

Los banqueros vieron el recibo, pero a la cajera no la vieron ayer en el pasillo. ¿Vieron el recibo?

Los actores vieron el guión, pero a la actriz no la vieron ayer en el escenario. ¿Vieron el guión?

**C.3.10 CLLD with +definite DO without DOM**

Los colegas vieron el tubo, pero la bióloga no la vieron ayer en el laboratorio. ¿El tubo estuvo en el laboratorio?

Los niños vieron el globo, pero la payasa no la vieron ayer en el carnaval. ¿El globo estuvo en el carnaval?

Los espectadores vieron el tutú, pero la bailarina no la vieron ayer en el teatro. ¿El tutú estuvo en el teatro?
Los pasajeros vieron el uniforme, pero la azafata no la vieron ayer en el avión.
¿Vieron la bufanda?

Los muchachos vieron el vaso, pero la florista no la vieron ayer en la florería.
¿Vieron las tijeras?

Los coleccionistas vieron el pincel, pero la pintora no la vieron ayer en el estudio.
¿Vieron el cuadro?

C.3.11 CLLD with +indefinite DO with DOM

Los practicantes vieron un rosario, pero a una monja no la vieron ayer en la iglesia.
¿Vieron un tubo?

Los admiradores vieron un lápiz, pero a una autora no la vieron ayer en la librería.
¿Vieron un globo?

Los clientes vieron un espejo, pero a una peluquera no la vieron ayer en la peluquería.
¿Vieron un tutú?

Los diseñadores vieron un vestido, pero a una modelo no la vieron ayer en el probador.
¿Un uniforme estuvo en el aeropuerto?

Los banqueros vieron un recibo, pero a una cajera no la vieron ayer en el pasillo.
¿Un vaso estuvo en la cocina?

Los actores vieron un guión, pero a una actriz no la vieron ayer en el escenario.
¿Un pincel estuvo en el escenario?

C.3.12 CLLD with +indefinite DO without DOM

Los colegas vieron un tubo, pero una bióloga no la vieron ayer en el laboratorio.
¿Vieron un rosario?

Los niños vieron un globo, pero una payasa no la vieron ayer en el carnaval.
¿Vieron un lápiz?

Los espectadores vieron un tutú, pero una bailarina no la vieron ayer en el teatro.
¿Vieron un espejo?

Los pasajeros vieron un uniforme, pero una azafata no la vieron ayer en el avión.
¿El vestido estuvo en la pasarela?

Los muchachos vieron un vaso, pero una florista no la vieron ayer en la florería.
¿El recibo estuvo en la caja?

Los coleccionistas vieron un pincel, pero una pintora no la vieron ayer en el estudio.
¿El guión estuvo probador?

**C.4 Agreement Filler Tokens**

**C.4.1 Subject-Verb Agreement Fillers**

Las princesas ricas compró muchas decoraciones de la mueblería. ¿Las princesas gastaron mucho dinero?

Las actrices maleducadas tomó muchas cervezas en la celebración. ¿Las actrices son descorteses?

Las secretarias perezosas leyó muchas revistas en la oficina. ¿Las secretarias hacen mucho trabajo?

Las mamás embarazadas comió muchos chocolates por la tarde. ¿Las mamás están a dieta?

Las artistas jóvenes pintó muchos cuadros para la exhibición. ¿Las artistas son trabajadoras?

Los financieros listos vendieron muchas propiedades el año pasado. ¿Los financieros compraron muchas propiedades?

**C.4.2 Noun-Adjective Agreement Fillers**

Los políticos corrupto aceptaron muchos sobornos la semana pasada. ¿Aceptaron muchos sobornos la semana pasada?

Los diplomáticos refinado leyeron muchos documentos para la reunión. ¿Leyeron muchos libros para la reunión?

Los bomberos nuevo recibieron muchas llamadas durante la noche. ¿Recibieron muchas llamadas durante el día?

Los soldados fuerte levantaron muchas pesas durante el entrenamiento. ¿Levantaron muchas pesas durante el entrenamiento?
Cuando merendamos por la tarde, mi compañera prefiere tomar algo frío, pero yo prefiero tomar algo caliente.

Así que ella toma agua y yo tomo mate con la merienda.

¿Mi compañera toma té con la merienda?

Cuando hablamos con los invitados, mi esposa prefiere su propia bebida, pero yo prefiero compartir una bebida con ellos.

Así que ella ofrece café y yo ofrezco mate después de la cena.

¿Mi esposa ofrece limonada después de la cena?

Cuando hacemos picnic con nuestros amigos, mi novia prefiere llevar algo dulce, pero yo prefiero llevar una bebida.

Así que ella lleva postres y yo llevo mate a los picnics.

¿Mi novia lleva vino a los picnics?

Cuando vamos a exposiciones de arte, mi colega prefiere ver artes plásticas, pero yo prefiero ver cuadros.

Al final ella compra esculturas y yo compro retratos en las exposiciones.

¿Mi colega prefiere artes plásticas?

Cuando vamos a la clase de pintura, mi sobrina prefiere pintar la naturaleza, pero yo prefiero retratar a personas.

Así que ella pinta paisajes y yo pinto retratos en la clase.

¿Mi sobrina prefiere pintar la naturaleza?
Cuando vamos al estudio de arte, mi amiga prefiere dibujar otras cosas, pero yo prefiero dibujar a personas.

Así que ella dibuja figuras y yo dibujo retratos en el estudio.

¿Mi amiga prefiere dibujar otras cosas?

D.2 Contrastive Focus with Null Subjects (CFN)

Cuando salimos a cenar, mi novia prefiere comer platos livianos pero yo prefiero comer algo sustancioso.

Así que come ensaladas y como milanesas en los restaurantes.

¿Mi novia come ensaladas?

Cuando cenamos en casa, mi esposa prefiere preparar el postre, pero yo prefiero cocinar el plato principal.

Así que hace alfajores y hago milanesas para la cena.

¿Mi esposa hace alfajores?

Cuando preparamos la cena, mi hermana prefiere preparar los entremeses, pero yo prefiero preparar la carne.

Así que prepara empanadas y prepara milanesas para la cena.

¿Mi hermana prepara empanadas?

Cuando trabajamos en la librería, mi colega prefiere la de cultura actual, pero yo prefiero estar en la sección de libros.

Así que vende revistas y vendo novelas en la librería.

¿Mi colega prefiere la sección de ciencia ficción?

Cuando escribimos sobre la historia del país, mi compañera prefiere contar relatos cortos, pero yo prefiero contar relatos largos.

Así que escribe cuentos y escribo novelas para la editorial.

¿Mi compañera prefiere contar leyendas?
Cuando estamos de vacaciones, mi prima prefiere leer algo corto, pero yo prefiero leer algo muy denso y largo.

Así que lee poemas y leo novelas durante las vacaciones.

¿Mi prima prefiere leer algo largo?

D.3 Topic Shift with Overt Subjects (TSO)

Mi amiga es adicta a la cafeína y por eso no duerme bien por la noche. Yo no tengo ese problema ya que no tomo café y evito totalmente la cafeína.

No obstante ella toma café y está despierta toda la noche.

¿Mi amiga duerme bien por la noche?

Mi esposa está obsesionada con la salud y cambió totalmente el desayuno. Yo no entiendo por qué tantos cambios y solo quiero comer medialunas con chocolate.

Sin embargo ella ofrece agua y sirve fruta para el desayuno.

¿Mi esposa está obsesionada con la ropa?

Mi abuela es muy golosa y siempre hace postres para las reuniones familiares. Yo soy diabético y no puedo comer los dulces. Igual, no importa lo que diga yo.

Finalmente ella lleva postres e ignora mis restricciones dietéticas.

¿Mi abuela hace postres para sus amigos?

Mi vecina es coleccionista de arte y es fanática de las artes plásticas. Yo soy vendedor de arte y por eso sé que es más barato colectar pinturas y se lo digo.

No obstante ella compra esculturas y gasta mucho dinero en sus compras.

¿Mi vecina gasta mucho dinero en sus compras?

Mi nuera se dedica al arte y puede pintar de todo. Yo creo que sería más lucrativo pintar retratos y sugiero eso mismo. Igual, no importa lo que diga yo.

Finalmente ella pinta paisajes y vende sus obras por poco dinero.

¿Mi nuera vende sus obras por poco dinero?
Mi hija no estudia bien en casa ya que se distrae fácilmente. Yo sé que es difícil y por eso intento eliminar distracciones. Igual, no importa lo que haga yo.

Finalmente ella dibuja figuras y mira los árboles por la ventana.

¿Mi hija mira los árboles por la ventana?

D.4 Topic Shift with Null Subjects (TSN)

Mi vecina es muy quisquillosa en cuanto a la comida y solo come ensaladas. Yo le preparo muchos platos ricos y se los llevo, pero no importa lo que haga yo.

Finalmente come ensaladas y no prueba otras comidas nunca.

¿Mi vecina es muy quisquillosa?

Mi suegra es buena cocinera, pero no acepta los gustos de los demás. Yo no como dulces ya que estoy a dieta y prefiero comer comidas sanas.

No obstante hace alfajores y viene a mi casa para compartirlos.

¿Mi suegra es muy buena cocinera?

Mi nuera sabe cocinar muchas cosas ya que estudia la gastronomía. Yo no quiero comer más platos argentinos sino que prefiero probar platos nuevos y se lo digo.

Sin embargo prepara empanadas e ignora mis pedidos gastronómicos.

¿Mi nuera estudia la gastronomía?

Mi hermana tenía un puesto de golosinas pero no ganaba mucho dinero. Yo sé que sería mejor vender varios productos y sugerí revistas y periódicos.

Hoy en día vende revistas y gana más plata que antes.

¿Mi hermana gana menos plata que antes?

Mi hija quiere ser autora y no tiene otros intereses. Yo creo que es mejor tener varios intereses y sugiero otras actividades, pero no importa lo que diga yo.

Finalmente escribe cuentos y pasa todo el día en su cuarto.

¿Mi hija pasa todo el día en la biblioteca?
Mi compañera de clase nunca estudia para los exámenes ya que prefiere relajarse. Yo soy una persona muy nerviosa así que siempre estudio y repaso toda la materia.

Sin embargo lee poemas y deja el estudio para otro día.

¿Mi compañera estudia cada día?

D.5 Topic Maintenance with Overt Subjects (TMO)

Últimamente, mi abuela no se siente muy bien. Tiene mucha sed, tiene dolor de cabeza y se cansa fácilmente.

Así que ella toma agua y ella descansa un rato antes de salir.

¿Mi abuela tiene dolor de cabeza últimamente?

Mi suegra es muy detallista. Cuando tiene cenas en casa, no se olvida de nada y hace todo a la perfección.

Por ejemplo ella ofrece café y ella pone música después de cenar.

¿Mi suegra es muy detallista?

Mi cuñada es muy sociable. Tiene muchos amigos y por eso va a muchas cenas a la canasta donde tiene que contribuir algo.

Así que ella lleva postres y ella comparte todo con sus amigos.

¿Mi cuñada tiene muchos amigos?

Mi hermana acaba de comprarse una casa. Quiere decorar la casa pero dice que no quiere colgar muchos cuadros.

Así que ella compra esculturas y ella decora la casa de forma moderna.

¿Mi hermana decora la casa de forma anticuada?

Mi tía es artista profesional y pasa mucho tiempo en el campo. Se inspira mucho allá y suele retratar el entorno en sus obras.

Así que ella pinta paisajes y ella vende sus obras en la ciudad.

¿Mi tía vende sus obras en el campo?
Mi prima es artista y también participa en la política. Quiere juntar las dos cosas e incorporar sus ideas en sus obras.

Así que ella dibuja figuras y ella escribe mensajes sobre las obras.

¿Mi prima escribe mensajes en las paredes?

D.6 Topic Maintenance with Null Subjects (TMN)

El año pasado mi mamá estaba muy estresada y comía de todo. Ahora quiere bajar de peso para sentirse mejor.

Así que come ensaladas y hace ejercicio por la mañana.

¿Mi mamá estaba enferma el año pasado?

El semestre pasado, mi amiga hizo un curso de cocina y aprendió muchas cosas. Ahora quiere mostrar sus talentos.

Así que hace alfajores y reparte todo entre sus amigos.

¿Mi amiga hizo un curso de arte el semestre pasado?

Ayer mi vecina encontró su receta favorita de empanadas que había perdido hace tiempo. No trabaja esta semana.

Así que prepara empanadas y comparte todo con el vecindario.

¿Mi vecina encontró una receta de pastelitos ayer?

Mi nieta quiere ganar plata para un viaje escolar. Hace unos meses se postuló para un puesto en un kiosco y ya empezó a trabajar.

Así que vende revistas y ahorra sus ingresos para el viaje.

¿Mi nieta ahorra sus ingresos?

Mi profesora hizo un curso de escritura. Estudió varios géneros y aprendió mucho. Ahora quiere mostrar sus talentos.

Así que escribe cuentos y comparte sus historias con los estudiantes.

¿Mi profesora comparte sus historias?
Mi jefa está muy estresada con el trabajo. No quiere sentirse tan estresada y por eso buscó formas de relajarse.

Así que lee poemas y escucha música relajante en su oficina.

¿Mi jefa escucha música relajante?
APPENDIX E
SAMPLE SCREEN SHOTS FROM THE ONLINE VERSION OF THE CONTEXT-MATCHING FELICITOUSNESS TASK

¡Bienvenido al experimento!
En este experimento usted leerá un contexto completo, seguido por una oración que será presentada parte por parte.

Las otras partes de la oración aparecerán como líneas en blanco. Usted decidirá qué tan rápido aparece cada parte de la oración en la pantalla, apretando la tecla 3 cuando está listo para ver la próxima parte. Es decir, aprete la tecla 3 para avanzar a la próxima palabra de la oración.

Después de haber leído el contexto y la oración, responderá a una pregunta de comprensión, apretando o la tecla 1 (SI) o la tecla 2 (NO).

Si tiene preguntas, hable con la investigadora por favor.
Aprete la tecla 3 cuando esté listo.

Figure E-1. Online CMFT: Instruction page 1 screenshot

Este experimento consiste de dos partes. Puede tomar un breve descanso al completar la primera parte.

Por favor lea las oraciones a un paso de lectura normal.
Responda a la pregunta de comprensión tan rápido y precisamente como le sea posible.

Si tiene preguntas, hable con la investigadora ahora por favor.

Aprete la tecla 3 para iniciar la sesión de práctica.

Figure E-2. Online CMFT: Instruction page 2 screenshot
El profesor Martín era el mejor profesor de biología de toda la universidad. Todos los estudiantes querían tomar sus cursos y era difícil matricularse. Por suerte, durante mi carrera universitaria, tomé tres cursos de él.
Figure E-4. Online CMFT: Practice session screenshot
Figure E-5. Online CMFT: Practice session comprehension question screenshot

Figure E-6. Online CMFT: End of practice session screenshot
Figure E-7. Online CMFT: Pre-token “ready” screenshot

¿Listo?

Cuando salimos a cenar, mi novia prefiere comer platos livianos, pero yo prefiero comer algo sustancioso.
Así que ________ ________ ________
__ __ __ __ ensaladas __ __ __ __ __ __ __ __ __ __

__ __ __ __ __ __ __ __ __ __ __ __ __ __ __

______ y _______ _______
Figure E-8. Online CMFT: Sample Contrastive Focus token screenshot
Figure E-9. Online CMFT: Contrastive Focus comprehension question screenshot

¿Mi novia come ensaladas?

Figure E-10. Online CMFT: Task completion and thanks screenshot

¡Muchas gracias por su participación!
Por favor dígale a la investigadora que la sesión ha terminado.
F.1 Grammaticality Judgment/Correct Task

Table F-4. Group average acceptance and standard deviation

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F.2 Context-Matching Felicitousness Task

Table F-3. Group average number of “good” ratings and standard deviation

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Table F-4. Individual average number of “good” ratings and standard deviation

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### F.3 Online Grammaticality Task

Table F-5. Group average RT (ms) and standard deviation: First region (ella/él/ello/siempre)

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Table F-6. Individual average RT (ms) and standard deviation: First region (*ella/él/ello/siempre*)

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Table F-7. Group average RT (ms) and standard deviation: Second region (verb)

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Table F-10. Individual average RT (ms) and standard deviation: Second region (DO)

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F.4 Online Context-Matching Felicitousness Task

Table F-11. Group average RT (ms) and standard deviation: First region (ella “she”)

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Table F-12. Individual average RT (ms) and standard deviation: First region ("ella" “she”)

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Table F-13. Group average RT (ms) and standard deviation: Second region (verb)

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Table F-15. Group average RT (ms) and standard deviation: Third region (DO)

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Table F-16. Individual average RT (ms) and standard deviation: Third region (DO)

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LIST OF REFERENCES


Prada Pérez, A. de, & Pascual y Cabo, D. (2011). Invariable *gusta* in the Spanish of Heritage Speakers in the US. In J. Herschensohn, & D. Tanner (Eds.), *Proceedings of the...


BIOGRAPHICAL SKETCH

Tiffany Judy received her PhD in Hispanic Linguistics from the University of Florida in 2013. She holds a BA in Spanish from the University of Northern Iowa and an MA in Hispanic Linguistics from the University of Iowa. Her primary research interest concerns second language acquisition, spanning such bilingual populations as child bilinguals, adult second and third language speakers and heritage language acquisition. Previous and current research projects examine the acquisition of morphological, syntactic, semantic and discourse-related properties in languages such as Spanish, Portuguese and English. Other current research projects include examining the acquisition of English as a second language by native speakers of Farsi and an edited volume regarding the acquisition of Spanish by native speakers of less-commonly studied languages such as Nahuatl, Romanian and Serbian. In addition to scholarly research, Tiffany is active in serving her university and the field of second language acquisition as well as teaching. She has served as a peer-reviewer for leading linguistics journals, aided in the organization of several linguistics conferences and mentored undergraduate linguistics students.