Examining the Effect of Training on L2 Processing and Comprehension of Spanish Null and Overt Subject Pronouns

By

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Submitted to the graduate degree program in Linguistics and the Graduate Faculty of the University of Kansas in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

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Date Approved: 28 May 2021

Abstract

An increasing amount of research has shown that second language (L2) learners experience difficulties in the acquisition of discourse properties (Sorace & Filiaci, 2006). This has notably been examined with respect to pronominal dependencies, particularly in pro-drop languages like Spanish. Subject pronouns in Spanish can be either null or overt, and their distribution is guided largely by discourse-pragmatic constraints. Specifically, Spanish natives prefer to use a null pronoun to maintain reference to the subject and an overt pronoun to refer to a non-prominent referent, such as the object. Studies with L1 English L2 Spanish learners have shown that learners overproduce and overaccept overt pronouns to refer back to prominent antecedents (e.g. Lubbers Quesada & Blackwell, 2009), and null pronouns to refer to non-prominent antecedents (e.g. Clements & Domínguez, 2017), resulting in pragmatically odd utterances. Furthermore, reading time studies show that native speakers are sensitive to these constraints during online processing, while L2 learners may not be (Feroce, Gabriele, Gelormini-Lezama, & Fiorentino, 2019; c.f. Judy, 2015). One possible reason that learners struggle to acquire the discourse-pragmatic constraints of Spanish subject pronouns is that they are not explicitly aware of them, as these properties are not typically taught in the L2 Spanish classroom. The present dissertation addresses this by examining whether explicit instruction and practice modulates learner sensitivity, online and offline, to these discourse-pragmatic properties.

A total of 45 intermediate L1 English L2 Spanish learners and 21 L1 Spanish speakers completed a self-paced reading task and an untimed sentence-selection task in which discourses were manipulated for referent prominence and pronoun type. Half of the L2 participants (N = 22; experimental group) also received explicit training and practice about the discourse-pragmatic properties of Spanish pronouns and comparison of pronoun usage between English and Spanish,

while the other half (N = 23; control group) and the native speakers did not. Results revealed a training effect for the sentence-selection task, where the learners in the experimental group, but not those in the control group, showed higher accuracy from pre-test to post-test in the pragmatically-appropriate selection of a null pronoun in subject continuation contexts and an overt pronoun in subject shift contexts. In contrast, results from the self-paced reading task did not show any training effect for the L2 learners, nor any reading time differences based on whether a null pronoun or overt pronoun referred to the subject or object of a previous sentence. Nevertheless, correlation analyses revealed that at the individual level, learners in the experimental group showed increased sensitivity in reading time patterns from pre-test to post-test and that those who made the most gains in the self-paced reading task also made the most gains in the sentence-selection task.

Taken together, these results suggest that L2 learners at low-intermediate levels of proficiency can demonstrate knowledge of the discourse-pragmatic properties of Spanish subject pronouns and that explicit training can modulate this (at least in an immediate post-test). Additionally, the lack of robust group sensitivity during the self-paced reading task suggests that the online integration of syntax-discourse properties in the L2 poses a notable difficulty for learners, in line with the Interface Hypothesis (Sorace, 2011), and that combining online and offline experimental methods can shed light on the L2 acquisition of discourse properties. Overall, this dissertation is one of the first studies to empirically examine how explicit training of a syntax-discourse interface property may modulate learner awareness of these forms, and ultimately can help foster discussion between researchers and educators across the fields of second language acquisition, psycholinguistics, and applied linguistics.

Acknowledgments

Completing a doctoral education has been one of the craziest and most rewarding journeys in my life so far, and I am grateful beyond words to have had the privilege to pursue this opportunity. I make no exaggeration when I say that I would not have gotten to this point if it were not for the incredible support I've received from my friends, mentors, and family.

To my friends back home, Monica, Julianne, Megan, Miguel, Savannah, Helie: thank you for all the patience and support even back in high school. I don't think anybody would be shocked to learn that I decided to pursue a PhD in Linguistics, but you all know that school was never exactly a walk in the park for me, and I would not have found a passion for learning without a little extra guidance from you all. To my friends from the University of Florida, Lilly, Tracey, Tate, Fischer, John: from the days of being a freshman on the rowing team, to coming home from late nights in the lab, studying for Arabic exams, and everything in between, you all were there along the way to provide friendship and support that I will continue to cherish through my life. A mi gente en Sevilla, Jose Carlos, Rocío Sánchez, Rocío Toscano, y much@s más, gracias/shukran por vuestro apoyo, a pesar de la distancia y los años, desde nuestros días en el patio del Rectorado, siempre habéis estado para animarme en este gran viaje académico. To the amazing lifelong friends I've met in graduate school: Lena, Lauren, Seulgi, Charlie (who I also am grateful for in helping me develop a love for data), Xiao, Longcan, Tingting, Delaney, Aron, Andrew, Alesha, Mónica, Mikel, Ana, Sergio, Nara, Ruth, Apoorv, Luisa, Nadia, Antonio, Laura, María Jose, Irene, Agustín, and of course the goofiest dudes I know, Shravan and Sumant. I could not have asked for a better group of friends to accompany me in graduate school and to always make sure to take time for myself, be it going on road trips, going out for drinks, testing

out new cooking adventures, and so many other things. Every one of you, near and far, have shown me the importance of friendship and laughter in leading a fulfilling life.

To the amazing mentors and supervisors I have had through my academic training: thank you for your positive encouragement, support, and pushing me to seek out opportunities when I most doubted myself. To my undergraduate mentors, Edith Kaan and Ana de Prada Pérez, thank you for giving me the chance to conduct research on second language learning, bilingualism, and psycholinguistics. You both instilled in me a passion for research and inspired me to continue on to graduate school. I also want to thank my dissertation committee members for having given me the opportunity to explore projects in other areas and think about language learning across the lifespan from an array of angles. Allard, thank you for encouraging me to dive into the world of sounds; I honestly did not anticipate I would be so fascinated by acoustic phonetics. Utako, thank you for taking the time to independently mentor me and Tingting in learning eye-tracking and for inviting us to contribute to projects on child language development. Amy, thank you not only for the opportunity to teach in Spanish as an out-of-department student, but for also helping me acquire a new passion for research in language learning technology. You've inspired me to continue working as an interdisciplinary researcher and I hope to continue facilitating dialogue between psycholinguistic researchers and language educators. Finally, thank you to my advisors: Alison Gabriele and Robert Fiorentino. You have made a huge impact on my life in learning to question assumptions, ask "why," and think critically about the nature of language learning, cognition, and experimental design. Whenever I was doubtful about pursuing certain opportunities, be it funding-, teaching-, or research-related, you always gave me the extra push I needed. During the tougher moments of grad school, you reminded me of the importance of taking credit in my work and not underselling myself while still striving to be the best academic I

can. Even in the midst of COVID-19, you continued to regularly advise me, check in, and helped me push forward with my dissertation research. Any grad student would be fortunate to have you as their advisors. Your mentorship has been invaluable in my grad school experience and I will no doubt continue to be a lifelong learner from having been advised by you.

Last but not least, I am thankful to my family. To my mom and dad, who have always taught me to keep an open mind and ask questions ever since they bought me that "Do Fish Drink Water?" book when I was a kid. To my Aunt Jenn Tackman, who encouraged me to attend grad school and to never stop exploring whatever opportunities will help me grow as an individual, both inside and outside academics. To my sister-in-law Jessica, thank you for your compassion and support these past 6 years. Finally, thank you to my siblings, Alex and Hadley. You have seen me put in countless study hours since high school and have always been by my side, even those moments when I have felt a bit without direction. I am grateful to have grown up only a year apart from you both and I truly don't know what I would do without you.

As a final point, I am thankful for a number of funding sources and individuals who have helped make this dissertation research possible. Thank you to Jorrig Vogels for sharing experiment materials, and to Gillian Lord, Timothy Gupton, and Cristóbal Lozano for helping me recruit participants during COVID-19. Additionally, thank you to KU Linguistics for the Dissertation Achievement Award and Frances Ingemann Scholarship. Finally, thank you to Mabel Rice for putting me on a T32 fellowship (NIDCD T32-DC000052) which has provided me with the time and financial resources to pursue this dissertation study.

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I dedicate this dissertation to my mom, who has sacrificed many of her own dreams so that my siblings and I could achieve our own.

Table of Contents

List of Figures

List of Tables

Chapter 1: Introduction

An increasing amount of second language research has examined the extent to which learners can integrate properties of syntax and discourse in their second language (L2). Sorace and Filiaci (2006) specifically propose the Interface Hypothesis, which states that although learners may be able to acquire narrow syntactic properties (i.e. features that are strictly determined by the grammar) in a native-like manner, they will still exhibit residual difficulties in the acquisition of properties at 'interfaces,' such as the syntax-discourse interface. This proposal has notably been examined with respect to the acquisition of null and overt pronouns in Romance languages. Sorace and Filiaci (2006) examined pronoun antecedent preferences in intrasentential contexts from native (L1) Italian speakers and L1 English L2 Italian near-native speakers in sentences such as 1:

1. La mamma dà un bacio alla figlia mentre lei/*pro* si mette il cappotto.
   'The mother kisses her daughter while she/*pro* puts on her coat.'

Speakers read sentences such as (1), which contained either an overt pronoun (e.g. *lei* 'she') or a null pronoun (*pro*) and had to choose a picture that depicted who was completing the action in the subordinate clause (in 1, putting on the coat). While it is grammatically possible for the overt pronoun *lei* to refer to either the mother or the daughter, Sorace and Filiaci found that native Italian speakers allowed the overt pronoun to corefer to the grammatical subject antecedent (*la mamma*) only 8% of the time. In contrast, the near-native speakers allowed this significantly more (27%), suggesting that they failed to acquire a property of the syntax-discourse interface.

Subsequent studies with L1 English L2 Spanish learners have also shown that learners overproduce overt pronouns to refer back to a prominent antecedent such as the subject (e.g. Lubbers Quesada & Blackwell, 2009), as well as overproduce and overaccept null pronouns to

refer to non-prominent antecedents (e.g. Clements & Domínguez, 2017; Rothman, 2009). Additionally, there is conflicting evidence as to whether learners actually show sensitivity to the discourse-pragmatic distribution of null and overt pronouns during online processing (Feroce, Gabriele, Gelormini-Lezama, & Fiorentino, 2019; Judy, 2015). In a previous self-paced reading study, Feroce et al. (2019) examined reading times and sentence ratings for contexts such as in Table 1.

Table 1

Stimuli subset from Feroce et al. (2019)

	Subject Reference	Object Reference
2. Null Pronoun	a.) Claudia habló con Ignacio por pocos minutos. Estaba ocupada. *Claudia talked with Ignacio for a few minutes. NULL was busy (feminine).*	b.) Ignacio habló con Claudia por pocos minutos. Estaba ocupada. *Ignacio talked with Claudia for a few minutes. NULL was busy (feminine).*
3. Overt Pronoun	a.) Claudia habló con Ignacio por pocos minutos. Ella estaba ocupada. *Claudia talked with Ignacio for a few minutes. She was busy (feminine).*	b.) Ignacio habló con Claudia por pocos minutos. Ella estaba ocupada. *Ignacio talked with Claudia for a few minutes. She was busy (feminine).*

In Spanish, native speakers tend to prefer to use a null pronoun as in (2) to maintain reference to the subject (*Carla*) and use an overt pronoun as in (3) to refer to a non-prominent antecedent, such as the object (*Ignacio*) (e.g. Alonso-Ovalle, Fernández-Solera, Frazier, & Clifton, 2002; Arnold, 1998; Cameron, 1992; Luján, 1999). In (2) and (3), the gender-marking on the adjective (*ocupada*) serves as an unambiguous cue as to who the subject of the second sentence refers to. Feroce et al. examined reading times and sentence ratings (administered in separate tasks) for the second sentence for each referent form and found different patterns based on whether reference was made back to the subject or object antecedent: null pronouns were read slower and rated as less natural when referring back to an object than a subject antecedent (2b vs. 2a) while overt pronouns were read slower and rated as less natural when referring back to a

subject than an object antecedent (3a vs. 3b). In addition, Feroce et al. examined intermediate-advanced L1 English L2 Spanish learners but found that neither lower proficiency nor higher proficiency learners (based on a median split of proficiency scores) showed any significant differences in reading time patterns for null or overt pronouns. In an offline sentence-rating task, both L2 proficiency groups performed better but still showed differences from native speakers. One potential explanation is that learners are not explicitly aware of the discourse-pragmatic constraints of Spanish null and overt pronouns, as these properties are not typically taught in the L2 Spanish classroom. Thus, the question arises if explicitly teaching learners about these discourse-pragmatic constraints and engaging in practice with feedback can lead to greater sensitivity to these discourse cues online and offline. Previous studies have investigated how explicit instruction can modulate comprehension and processing of morphosyntactic features (e.g. Fernández-Cuenca, 2019), but less is known about whether training effects would be seen for syntax-discourse properties, which are known to pose notable difficulties for learners. This in mind, the present dissertation aims to see whether explicit training and instruction of the discourse-pragmatic distribution of null and overt pronouns can lead to gains in processing. The broad research questions of this study are the following:

1. Do L2 learners show online and offline sensitivity to the discourse-pragmatic constraints of Spanish null and overt pronouns similar to native speakers?
2. Does explicit instruction and training help modulate learner sensitivity, online and offline, to the discourse-pragmatic constraints of Spanish null and overt pronouns?

To answer these questions, this study employs a self-paced reading task based on materials from Feroce et al. (2019) and a sentence-selection task based on materials by Vogels, Krahmer, and Maes (2013), in a pre-test/post-test design. The study also contributes to the existing literature by

incorporating a novel training intervention for an L2 experimental group in which learners are provided with explicit instruction about the discourse-pragmatic functions of null and overt pronouns along with a sentence-selection task with corrective feedback.

Overall, this dissertation will help shed light on theories of second language acquisition and processing, and in particular the Interface Hypothesis (Sorace & Filiaci, 2006), which predicts that syntax-discourse interface properties are extremely difficult, if not impossible, for L2 speakers to acquire. This dissertation examines whether it is possible for L2 Spanish learners at lower-intermediate proficiency levels to demonstrate any sensitivity to the discourse-pragmatic properties of null and overt subject pronouns, when they are explicitly taught about them. Additionally, this dissertation incorporates both online (self-paced reading) and offline (sentence selection) measures, as it has been proposed that L2 learners may not demonstrate sensitivity to these properties online due to a lack of cognitive processing resources (Roberts, Gullberg, & Indefrey, 2008; Sorace, 2011). In the following section, studies of native and L2 referential processing in Spanish are reviewed.

Chapter 2: Background

This dissertation is grounded within the literature of several fields. First, an overview is provided on the psycholinguistics of referential processing broadly as well as in native Spanish speakers specifically. Next, research is reviewed on the acquisition of pronouns in L2 Spanish learners from different experimental perspectives. Finally, an overview is provided of psycholinguistic methods used in second language pedagogy, as this motivates the training portion of this dissertation study.

Overview of Referential Processing

Theories of referential production and comprehension in native speakers generally converge on the observation that the more salient an entity is in discourse, the less explicit the anaphoric form needed to refer back to it (e.g., Almor, 1999; Ariel, 1990; Gernsbacher, 1989; Gundel, Hedberg, & Zacharski, 1993; for overview see Almor & Nair, 2007 and Arnold, 2010).[1] The notion of 'saliency' generally refers to how prominent a referent is in the discourse representation constructed in the individual minds of speakers and listeners (e.g. Arnold, 1998), and the most salient referent in a declarative sentence is typically the grammatical subject and topic (e.g. Gordon et al., 1993; Hudson-D'Zmura & Tanenhaus, 1998). A highly explicit form such as a proper name, which often unambiguously identifies its referent, is often used in contexts when referring back to a less salient antecedent, such as when there are multiple competing referents or in which there are several intervening clauses since the referent was last mentioned in the discourse. On the other hand, a pronoun, which is less explicit and may have multiple potential referents on the basis of its linguistic properties alone (such as gender and number marking), is often used when the antecedent is the salient topic in the discourse.

[1] Arnold (1998) distinguishes 'saliency' from 'activation' as a property of the structure of linguistic input which is used to update the activation of referents in working memory in the discourse representation of the speaker.

One study illustrating the role of linguistic saliency in referent production was a study by Vogels et al. (2013). In the study, native Dutch speakers were presented images containing two people (two pictures which together formed one scene) and an accompanying, open-ended three-sentence discourse which participants had to complete (speaking). Discourse contexts were manipulated such that the two characters were introduced in the first sentence, followed by mention of one of the characters in the second sentence, and then a third open-ended sentence that started with "Therefore." For the visual contexts, the first image displayed both characters together, and the second picture displayed one of the two characters carrying out an action. Crucially, the second picture could either be the same character that was mentioned in the second sentence of the discourse (agent continuation) or not (non-agent continuation) and could either be in the foreground (visually salient) or background of the picture (less visually salient). The researchers found that whether a character was foregrounded or backgrounded in the picture only influenced whether participants continued to talk about the agent character or not, but did not have an effect on the use of pronouns versus nouns. On the other hand, participants were more likely to use a pronoun over a noun when the same agent in the second sentence continued to be mentioned in speakers' sentence-completions, thus highlighting the role of linguistic saliency in speakers' referent productions.

The Informational Load Hypothesis

Processing accounts of referential comprehension emphasize the role of semantic activation of a referent in memory, whereby more explicit anaphoric forms may be needed to refer to entities that are weakly represented in the speaker's or listener's memory. One such proposal is the Informational Load Hypothesis (Almor, 1999). According to the Informational Load Hypothesis (ILH), successful integration of an anaphoric expression in discourse is a

balance between that anaphor's pragmatic function in a given discourse and the processing cost associated with it. Under this proposal, an anaphor's function in discourse is not just to identify a referent, but to also potentially add new information about the referent or the speaker's attitude about the referent (Almor & Nair, 2007, p. 91). Processing cost refers to interference in working memory based on the need to maintain separate representations of the anaphor and its referent until they can be integrated in the discourse. This interference between the anaphor and its discourse referent is specifically impacted by their semantic overlap as well as the amount of activation in memory of each.[2] Successful integration of an anaphor can be achieved if there is pragmatic justification for the degree of semantic overlap with its referent in discourse. The ILH assumes that speakers should use the least explicit anaphoric form needed for their communicative purpose, following Grice's maxim of quantity (Almor, 1999; Grice, 1975). Thus, anaphoric expressions that are rich in semantic detail, such as proper names and definite noun phrases (NPs), or which have a high level of semantic activation (such as clefted focus constructions, like 'It was the bird that ate the fruit'; example from Almor, 1999) may result in greater integration difficulty than expressions with less semantic detail, such as pronouns, when there is no discourse justification. Important to note is that even anaphors with a high processing cost such as proper names can be easily integrated into discourse if there is pragmatic justification. Further discussion of the ILH is presented below for studies conducted on Spanish.

Referential Processing in Native Spanish

Spanish is a null subject language and thus allows for subject pronouns to be either realized phonetically or not. Variationist studies looking at Spanish pronoun production have

[2] Other studies (Almor & Nair, 2007; Gernsbacher, 1989; Peters, Boiteau, & Almor, 2017) have suggested that the processing cost of a referential expression is associated not necessarily with the overlapping features and competing activation of referent and anaphor, but rather that this degree of overlap can result in suppression of other information in the discourse which may lead to integration difficulty.

found that the distribution of null and overt subject pronouns is influenced by an array of factors, including grammatical person and number (Bayley & Pease-Álvarez, 1997; Bentivoglio, 1987); tense, aspect, and mood morphology (Cameron, 1992; Hochberg, 1986); the lexical semantics of verbs (Silva-Corvalán, 1994; Torres Cacoullos & Travis, 2010); and clause type (Enríquez, 1984; Shin & Montes-Alcalá, 2014), among others (for overview, see Carvalho, Orozco, & Shin, 2015). Studies have also shown that discourse-pragmatic factors, in particular switch reference and co-reference (i.e. whether the subject of a verb is the same or different as the subject of the preceding tensed verb; Otheguy, Zentella, & Livert, 2007),[3] also influence the distribution of null and overt pronouns (Cameron, 1992; Enríquez, 1984; Flores-Ferrán, 2004; Hochberg, 1986; Otheguy et al., 2007; Silva-Corvalán 1994). Specifically, null pronouns are used to maintain topic reference while overt pronouns are used to indicate a shift in reference, although this distinction is by no means categorical. When a referent is salient and continues to be the topic of discussion or can be easily identified by the interlocutors, the use of an overt pronoun would be over-informative and thus may result in an utterance that sounds pragmatically odd. On the other hand, in cases for which a referent is non-salient, such as when first being introduced or when there are multiple potential referents, the use of a null pronoun may be under-informative and can also result in a pragmatically-odd sounding utterance. The pragmatically unjustified uses of null and overt pronouns may have consequences for how these forms are processed in real time.

Support for the ILH in Spanish comes from a study by Gelormini-Lezama and Almor (2011). In their study, Gelormini-Lezama and Almor examined reading times from Spanish native speakers as they read two-sentence discourses as in (4) which were either topic-continuation (subject antecedent) or topic-shift (object antecedent) contexts. The subject of the

[3] The terms “same reference” and “switch reference” are used in the variationist literature, and are roughly equivalent to describing reference back to a salient or non-salient antecedent.

second sentence was manipulated to be either a repeated name, an overt pronoun, or a null pronoun. Additionally, the second sentence contained a gender-marked object clitic pronoun (*la* 'her' in 4b) that matched in gender with either the subject or the object of the first sentence.

4. Subject condition lead-in: a) Juan se encontró con María.
'Juan met with María.'

Object condition lead-in: a') María se encontró con Juan.
'María met with Juan.'

Target sentence: b) Juan/ Él/ Ø la vio triste.
'Juan/He/NULL found her sad.'

Gelormini-Lezama and Almor examined whole-sentence reading times from the target sentence (4b). They found that repeated names were read slower than null pronouns in the subject condition (4a), but faster in the object condition (4a'). These results provided evidence for the Repeated Name Penalty in Spanish, a phenomenon that has been observed in several languages (Almor, Maia, Cunha Lima, Vernice, & Gelormini-Lezama, 2017; Gordon, Grosz, & Gilliom, 1993; de Carvalho Maia, Vernice, Gelormini-Lezama, Cunha Lima, & Almor, 2017; Miyao, 2017; Shoji, Dubinsky, & Almor, 2017; Yang, Gordon, Hendrick, & Wu, 1999). According to the ILH, the Repeated Name Penalty emerges because repeated names carry more information than is necessary to identify its referent when referring back to a salient entity (such as the subject in topic-continuation contexts). Thus, the high overlap in semantic features between the repeated name and its referent results in greater interference in working memory that is not justified by the discourse context. If the repeated name were emphasized, for example, this would provide justification for using a repeated name in the discourse and thus may not result in processing difficulty. In addition to the slowdowns for repeated names, Gelormini-Lezama and

Almor found that the overt pronoun was read slower than null pronouns in the subject condition, but faster in the object condition. Gelormini-Lezama and Almor termed this finding the Overt Pronoun Penalty, explaining that the use of an overt pronoun without discourse justification in the subject-continuation condition (4a) results in an excess of information in working memory that cannot be easily integrated into the discourse and thus is manifested as a reading time slowdown. Specifically, if one assumes that the subject will continue to be the topic of the discourse, then a null pronoun should be used to refer back to that subject. Although it is possible that differences in sentence length and the presence of an object pronoun could have skewed the pattern of results when comparing different referent forms to each other, the fact that a significant interaction emerged between referent form and subject/object continuation makes this possibility less likely. Crucially, in the object condition, the null pronoun was read significantly slower than the overt pronoun and repeated name, thus sentence length cannot account for the pattern of results. Reading time differences also emerged across referential contexts (comparing subject and object contexts) for each referent form, although no statistics were reported. Numerically, null pronouns were read slower when referring back to an object than a subject antecedent, while overt pronouns and repeated names were read slower when referring back to a subject than an object antecedent.

Gelormini-Lezama and Almor (2014) again examined the Overt Pronoun Penalty in Spanish, but controlled the length of the target sentence (which was not controlled among items in the 2011 study; Gelormini-Lezama, 2010) along with using gender-marked adjectives to denote the referent instead of an object clitic pronoun. Consider (5):

5. Subject condition lead-in sentence: a) Juan se encontró con María en el parque.
'Juan met with María in the park.'

Object condition lead-in sentence: a') María se encontró con Juan en el parque.
'María met with Juan in the park.'

Target sentence: b) Él/ Ø estaba contento.
'He/NULL was happy-MASC.'

In (5), the most coherent target continuation for the subject condition is the use of a null pronoun and the most coherent target continuation in the object condition is the use of an overt pronoun (repeated names were not examined). Similar to Gelormini-Lezama and Almor (2011), sentences with overt pronouns were read slower than sentences with null pronouns in the subject condition, but this pattern was flipped in the object condition. Additionally, null pronoun target sentences were read significantly slower in the object condition than in the subject condition. The overt pronoun target sentences were read slower in the subject condition than in the object condition, although this difference was numerical and no statistics were reported. The Overt Pronoun Penalty aligns with the predictions of the ILH because the use of an overt pronoun to refer back to a salient antecedent (the subject) is not justified by the discourse and thus results in interference of referents in memory which cannot be easily integrated into the previous context (Almor et al., 2017; Maia et al., 2017; Shoji et al., 2017; c.f. Miyao 2017 and Yang et al. 1999).

It is important to note that other studies have found mixed results for pronoun-antecedent biases in Spanish. For intrasentential anaphora, some studies have found subject antecedent preferences for null pronouns and object antecedent preferences for overt pronouns (explicit referent assignment: de la Fuente 2015, experiment 3; reading times: Garnham, Oakhill, Ehrlich,

& Carreiras, 1995[4]; Keating, Jegerski, & VanPatten, 2016), while other studies have found either no antecedent bias for overt pronouns (reading times: Filiaci, Sorace, & Carreiras, 2014; explicit referent assignment: Contemori, Asiri, & Perea, 2019, experiment 1; Jegerski, VanPatten, & Keating, 2011) or for null pronouns (reading times and ratings: Chamorro, Sorace, & Sturt, 2016; ratings only: Bel & García-Alcaraz, 2018; explicit referent assignment: Chamorro, 2018; Schimke, de la Fuente, Hemforth, & Colonna, 2018). Similarly, mixed results have been reported for intersentential anaphora in offline referent assignment tasks (subject antecedent preference for null pronouns but no bias for overt pronouns: Alonso-Ovalle et al., 2002; Contemori et al., 2019, experiment 3[5]; subject biases for null pronouns and object biases for overt pronouns: Forsythe, 2018). Nevertheless, it is important to keep in mind that these studies greatly differ in experimental design, such as clause ordering and discourse coherence relations, the presence of same or different gender antecedents,[6] the presence of only null pronouns versus both null and overt pronouns, and dialect of Spanish examined, among other factors. Thus, while certain tendencies are observed for referential forms in Spanish based on the previous literature, it is clear that the distinctions are not categorical and may be impacted by a range of factors.

Acquisition of L2 Spanish Pronouns

Research on the acquisition of referential subjects in L2 Spanish has been examined from different theoretical perspectives (for overview, see Lubbers Quesada 2015, Zyzik 2017). Early studies generally focused on the syntactic constraints associated with null subjects (e.g. Isabelli, 2004; Liceras, 1988, 1989; Liceras & Díaz, 1998; Lozano, 2002; Pérez-Leroux & Glass, 1999;

[4] Garnham et al. (1995) only examined overt pronouns, not null pronouns.
[5] Contemori et al. (2019) only examined sentences with overt pronouns, not null pronouns. Additionally, the authors observed that the preference for an overt pronoun to refer to a subject antecedent is higher for intersentential than intrasentential contexts (compare experiments 3 and 5).
[6] Carreiras, Garnham, and Oakhill (1993) found reading time slowdowns for clauses with overt pronouns when there were two potential gender-matching antecedents in the sentence versus only one, suggesting that the lack of a gender cue may lead readers to consider both subject and object antecedents.

Phinney, 1987; Rothman & Iverson, 2007). However, more recent studies have examined if learners are sensitive to the same linguistic constraints in subject pronoun expression as native speakers (e.g. Geeslin & Gudmestad, 2008; Linford & Shin, 2013; Prada-Pérez & Feroce, 2020; Zahler, 2018), and if sensitivity to the discourse-pragmatic distribution of null and overt pronouns emerges in production (e.g. speech: Blackwell & Lubbers Quesada, 2012; Lubbers Quesada & Blackwell, 2009; writing: Martín-Villena & Lozano, 2020), in comprehension (e.g. Clements & Domínguez, 2017; Geeslin, Linford, Fafulas, 2015; Geeslin, Linford, Fafulas, Long, & Díaz-Campos, 2013; Jegerski, VanPatten, & Keating, 2011) as well as during online processing (Bel, Sagarra, Comínguez, & García-Alcaraz, 2016; Feroce et al., 2019; Judy, 2015). These studies generally observe that learners can acquire the syntactic properties of null and overt pronouns, but they overextend either overt pronouns or null pronouns beyond the contexts in which native speakers would use them. In the sections below, past research demonstrating L2 learner difficulty in the acquisition of Spanish subject pronouns is reviewed.

L2 Spanish Subject Pronoun Expression

Several studies on L2 Spanish pronouns have examined if learners are sensitive to the same linguistic predictors as native speakers in subject pronoun expression (Abreu, 2009; Geeslin & Gudmestad, 2008, 2011, 2016; Gudmestad & Geeslin, 2010; Gudmestad, House, & Geeslin, 2013; Linford, 2016; Linford & Shin, 2013; Long, 2016; Prada-Pérez & Feroce, 2020; Zahler, 2018). For example, Gudmestad et al. (2013) examined oral narratives from 16 highly advanced L2 learners (all were graduate students) and 16 native Spanish speakers. They found that for third-person referential forms, L2 learners were similar to native speakers in their preferences for lexical NPs and overt pronouns over null pronouns in switch reference contexts. On the other hand, Prada-Pérez and Feroce (2020) found that sensitivity to switch reference is

not seen in lower proficiency learners (although see Linford & Shin, 2013). Additionally, they found that higher proficiency L2 speakers produced overt pronouns at higher rates than native speakers in coreferential contexts (Natives: 20.9%, L2: 46.9%) as well as in switch-reference contexts (Natives: 45.8%, L2: 74.9%). It is important to note that overproduction in L2 learners is not restricted to overt pronouns as overproduction of null pronouns as in contexts of switch reference has been observed as well (Lozano, 2009; Lubbers Quesada & Blackwell, 2009; Montrul & Rodríguez Louro, 2006).

Experimental Research with L2 Spanish Pronouns

Experimental studies examining L2 Spanish pronoun comprehension have employed behavioral tasks such as sentence ratings (Lozano, 2002), explicit referent assignment (e.g. Jegerski et al., 2011), picture-sentence matching tasks (e.g. Clements & Domínguez, 2017), and sentence-context rating tasks (e.g. Judy, 2015; Rothman 2009). In general, these studies observe similar patterns as production studies, where learners, particularly at lower levels of proficiency, overaccept null pronouns or overt pronouns in pragmatically infelicitous contexts (see Rothman, 2009). Rothman (2009) and Clements and Domínguez (2017) argue that the fact that difficulty observed in L2 learners of Spanish is not restricted to overt pronouns and extends to null pronouns as well as goes against the theory of L1 transfer, as originally posited by the Interface Hypothesis. Thus, the fact that the L2 learners had problems with both null and overt pronouns is argued to be evidence against this prediction. Nevertheless, it is important to keep in mind that the Interface Hypothesis makes predictions specifically for near-native speakers (Sorace, 2011), who have not been the target population in studies of L2 Spanish. Rothman (2009) also argues that the fact that advanced speakers show similar patterns to native speaker controls is evidence that difficulties with the syntax-pragmatics interface can be overcome.

To date, only a handful of studies have examined online processing of L2 Spanish pronouns (Bel et al., 2016; Feroce et al., 2019; Johnston, 2021; Judy, 2015). Feroce et al. (2019) examined referential processing in L1 English L2 Spanish learners as they completed self-paced reading and sentence-judgment tasks with null pronouns, overt pronouns, and repeated names. Table 2 presents the same sample stimuli as in Table 1 but also includes a Repeated Name condition. Reading times were measured at the second sentence in each discourse.

Table 2

Stimuli from Feroce et al. (2019)

	Subject (NP1) Reference	Object (NP2) Reference
6. Null Pronoun	a.) Claudia habló con Ignacio por pocos minutos. Estaba ocupada. *Claudia talked with Ignacio for a few minutes. NULL was busy (feminine).*	b.) Ignacio habló con Claudia por pocos minutos. Estaba ocupada. *Ignacio talked with Claudia for a few minutes. NULL was busy (feminine).*
7. Overt Pronoun	a.) Claudia habló con Ignacio por pocos minutos. Ella estaba ocupada. *Claudia talked with Ignacio for a few minutes. She was busy (feminine).*	b.) Ignacio habló con Claudia por pocos minutos. Ella estaba ocupada. *Ignacio talked with Claudia for a few minutes. She was busy (feminine).*
8. Repeated Name	a.) Claudia habló con Ignacio por pocos minutos. Claudia estaba ocupada. *Claudia talked with Ignacio for a few minutes. Claudia was busy (feminine).*	b.) Ignacio habló con Claudia por pocos minutos. Ella estaba ocupada. *Ignacio talked with Claudia for a few minutes. Claudia was busy (feminine).*

Recall that Spanish null pronouns are associated with salient antecedents, such as a subject, while overt pronouns are often associated with non-salient antecedents, such as the object. In addition, repeated names are associated with less-salient antecedents, and reference to salient antecedents has been shown to cause processing delays both in English (Gordon et al., 1993) and Spanish (Gelormini-Lezama & Almor, 2011). The researchers found that in the self-paced reading task, native speakers showed longer reading times for target sentences with null pronouns when they referred to object (6b) than subject antecedents (6a), and longer reading times for overt pronouns and repeated names when they referred to subject (7a, 8a) than object

antecedents (7b, 8b). In contrast to the native speakers, neither the lower proficiency nor higher proficiency L2 learners showed any significant reading time differences between subject and object antecedents for either null or overt pronouns. For repeated names, however, the higher proficiency learners showed longer reading times for subject than object antecedents, similar to the native speakers. Feroce et al. interpreted these results as suggesting that while lower proficiency learners may experience broad processing difficulty during referential comprehension, higher proficiency learners may be able to rely on discourse constraints present in their L1, as evidenced by the sensitivity in the Repeated Name condition. The lack of sensitivity to null and overt pronouns may be due to a processing burden with integrating multiple sources of information to resolve reference; specifically, speakers need to use gender-marking on the adjective as well as the discourse saliency properties to integrate the null and overt pronouns into the discourse. This is supported by the fact that in a separate offline sentence-rating task, all speaker groups (natives, lower proficiency learners, and higher proficiency learners) showed lower acceptability ratings when null pronouns referred to object than subject antecedents, and also when overt pronouns and repeated names referred to subject than object antecedents. However, while the native speakers rated overt pronouns as more acceptable than null pronouns when referring to object antecedents, the lower proficiency learners rated null pronouns more acceptable and the higher proficiency learners showed no difference between null and overt pronouns. These results suggest that learners overall have limited sensitivity to the relationship between antecedent saliency and referent forms in their L2, particularly for those forms that are guided by different discourse-pragmatic constraints between the L1 and the L2 (i.e. null and overt pronouns).

Summary of L2 Spanish Pronoun Research

Overall, findings from production, comprehension, and processing studies suggest that L2 Spanish learners have difficulty acquiring the discourse-pragmatic constraints on the distribution of null and overt pronouns. Although learners are similar to natives in that they produce higher rates of overt pronouns in contexts of switch reference than same reference and higher rates of null pronouns in same reference than switch reference, they may still produce overt and null pronouns at higher rates than native speakers or overaccept them in contexts which are inappropriate for native speakers. Furthermore, studies of online processing in L2 Spanish remain limited, with only two examining L1 English L2 Spanish learners (Bel et al., 2016; Feroce et al., 2019), and these studies present conflicting results as to whether or not learners show sensitivity to the discourse-pragmatic properties of null and overt pronouns. Thus, there remains a debate regarding whether it is possible for learners to show sensitivity to these forms.

Input Processing and Structured Input

The acquisition of discourse-pragmatic constraints guiding null and overt pronoun usage in Spanish is notoriously difficult for multiple reasons. First, it is not an aspect of the language that tends to be explicitly taught in the classroom (Lubbers Quesada & Blackwell, 2009; Clements & Domínguez, 2017; Feroce et al., 2019); rather, learners are simply taught that null pronouns are an available option (Domínguez, 2013). Additionally, the input that learners are exposed to is inherently noisy (i.e. rates of subject pronoun usage in speech is highly variable) and thus it may be difficult to converge on a target pattern of usage.[7] Variationist studies show that native speaker pronoun production is anything but a categorical phenomenon and is influenced by an array of factors (for overview, see Carvalho, Orozco, & Shin, 2015).

[7] It should be noted that sensitivity to syntax-discourse interface phenomena may emerge after immersion abroad (Leal, Slabakova, & Farmer, 2017; Rothman & Iverson, 2007; c.f. Clements & Domínguez, 2017).

Furthermore, some studies show that native Spanish speakers may use overt pronouns at higher rates when teaching learners in the classroom compared to in naturalistic contexts with other native speakers (Dracos, 2018; c.f. Gurzynski-Weiss et al., 2018), further complicating the issue as to how learners converge on a target pattern.[8] Thus, the question arises as to whether explicitly bringing learners' attention to these discourse-pragmatic properties can enhance their sensitivity to Spanish null and overt subject pronouns. The present study aims to address this question by incorporating a novel training design in which learners are explicitly taught about the discourse-pragmatic properties of null and overt pronouns in Spanish. To do so, learners are provided with structured input and practice activities that have been developed with the methods proposed in the Processing Instruction framework in mind (VanPatten, 1996, 2002, 2004; VanPatten & Cadierno, 1993).

Processing Instruction is a pedagogical framework that takes input manipulation as a key tool to get L2 learners to attend to specific grammatical forms that might normally be overlooked (VanPatten, 2002). Null and overt pronouns are a linguistic feature that are not highly salient in the input and thus lend themselves useful to a training intervention via explicit instruction and practice. Processing Instruction (PI) involves providing learners with explicit instruction about a target form and then structured input practice. Structured input is input that is manipulated in some way to encourage learners to rely on a particular form and structure to derive meaning (VanPatten, 1996). Crucially, in the input, (1) one new form must be presented at a time, (2) meaning must be kept in focus, (3) input must move from the sentence-level to discourse, (4)

[8] Given that rates of subject pronoun expression in Spanish differ between dialects (Caribbean varieties tend to have much higher rates than other varieties for co-referring to salient antecedents), the question arises as to what is the target pattern of use that learners should converge on. Crucial to note, however, is that even in Caribbean varieties, speakers are still guided by the same constraints of usage as in non-Caribbean varieties; in particular, switch reference contexts are still a significant predictor of using an overt pronoun over a null pronoun (e.g. Cameron, 1992; Martínez-Sanz, 2011).

oral and written input mediums are both used, (5) the learner must do something with the input, and (6) psycholinguistic processing mechanisms of L2 learners must be kept in mind when designing the task. Overall the number of studies that actually combine training and psycholinguistic processing measures in Spanish remains limited (Dracos, 2013; Fernández-Cuenca, 2019), but still provide evidence for advantages to being taught via PI. For example, Fernández-Cuenca (2019) examined L1 English L2 Spanish learners' knowledge of subjunctive mood morphology in an eye-tracking study. She found that from pre-test to post-test 1, learners that received PI training showed longer reading times for ungrammatical items while the control group did not. Thus, there is evidence that PI may actually help modulate learners' processing of certain linguistic forms in their L2.

While previous studies of PI have focused on the learning of morphosyntactic properties, it remains to be seen how principles based on the PI framework can be extended to other domains, such as with syntax-discourse interface properties. Teaching such linguistic properties to learners has the potential to guide learners in acquiring structures that are prevalent in the naturalistic speech of native speakers but which may not be encountered in the classroom (Leal & Slabakova, 2019; Rothman, 2010; Teixeira, 2016). Furthermore, while researchers in psycholinguistics have discussed the potential need to teach interface phenomena to L2 learners, few studies have actually taken this approach empirically (Teixeira, 2021). Thus, this dissertation contributes to understanding how explicit instruction of syntax-discourse properties may guide learners' attention toward the use of discourse-cues during online processing and whether it is possible to see sensitivity to Spanish null and overt pronouns similar to native speakers.

Chapter 3: Current Study and Methods

Current Study

Previous research has shown that L2 Spanish learners struggle to attain native-like sensitivity to the discourse-pragmatic distribution of null and overt pronouns. The discourse constraints guiding the use of Spanish null and overt pronouns are not explicitly taught in the L2 classroom, and learners must deal with variable input, making it particularly difficult to gain sensitivity to them. This raises the question as to whether L2 Spanish learners can show sensitivity to these discourse constraints if they are explicitly taught them. Few studies so far have combined training of features in Spanish and psycholinguistic processing measures, and to the best of my knowledge, no previous study has examined explicit instruction of null and overt pronouns in Spanish in an experimental setting. Finally, only a few studies have examined whether learners show sensitivity to the discourse-pragmatic constraints of null and overt pronouns during online processing. Thus, this dissertation contributes to a growing body of literature examining not just processing of null and overt pronoun in L2 Spanish, but also incorporates training and psycholinguistic processing measures.

This dissertation builds on Feroce et al. (2019) by examining L2 comprehension of Spanish null and overt third-person singular subject pronouns before and after receiving explicit training and feedback on the discourse-pragmatic distribution of these forms. Feroce et al. (2019) found that L2 Spanish learners show some sensitivity to the discourse-pragmatic properties of Spanish subject pronouns offline but not during online processing. Additionally, they found that learners showed sensitivity online to repeated names, similar to the native speakers, with faster reading times for object than subject antecedents. Nevertheless, in the rating task both learners and natives showed strong dispreferences (lower ratings) for repeated names when directly

compared to null and overt pronouns. This strong dispreference for repeated names suggests that including them in the experiment may have obscured the ability to observe sensitivity to the distribution of null and overt pronouns. Thus, the scope of this dissertation is restricted to the processing and comprehension of null and overt pronouns, the referential forms that were difficult for the learners, without including repeated name conditions. In a pre-test/post-test design, learners completed a self-paced reading task with two-sentence discourses (Feroce et al., 2019; Gelormini-Lezama & Almor, 2011, 2014) to gauge their sensitivity during online processing as well as a sentence-selection task as a measure of offline comprehension. In order to see if explicit instruction guides learners toward relying more on discourse-pragmatic cues in processing/comprehension of these pronouns, half of the learners in this study received explicit instruction highlighting the difference between English and Spanish, the roles of subject-continuation and subject-shift contexts in guiding the use of Spanish null and overt pronouns (respectively), as well as practice and corrective feedback for a similar version of the sentence-selection task. The other half of the learners did not receive this instruction and practice.

Broad Research Questions

The broad research questions of the study are the following:

1. Do L2 learners show online and offline sensitivity to the discourse-pragmatic constraints of Spanish null and overt pronouns similar to native speakers?

    The first research question addresses whether learners will show sensitivity to null and overt pronouns at the pre-test stage. While native speakers are expected to show differences in reading times and sentence interpretations for each anaphoric expression depending on the discourse context, in line with processing theories of referent comprehension (Informational Load Hypothesis: Almor, 1999), L2 learners may show

difficulty with either null or overt pronouns. Recall that the Interface Hypothesis predicts that L1 English L2 Spanish speakers should show difficulty with overt pronouns but not null pronouns, although previous studies have shown that learners at intermediate and advanced levels of proficiency have difficulty with both (Clements & Domínguez, 2017; Feroce et al., 2019; Rothman, 2009).

2. Does explicit instruction and training help modulate learner sensitivity, online and offline, to the discourse-pragmatic constraints of Spanish null and overt pronouns?

The second research question addresses whether learner sensitivity to null and overt pronouns can be modulated by explicitly teaching them about the discourse-pragmatic tendencies and providing practice and corrective feedback, by specifically using a sentence-selection task (more details are provided in the Methods section). Evidence for the effectiveness of the training would emerge as more qualitatively native-like patterns in the post-test compared to the pre-test for the L2 Experimental group, as well as larger improvements from the pre-test to the post-test for the L2 Experimental group compared to the L2 Control group who does not receive explicit training and practice.

Participants

The native controls in this study were 21 native Spanish speakers (16 females, mean age 21.9, range 18-27) recruited from the University of Granada, Spain. None of the native Spanish speakers reported growing up bilingual. The L2 learners in this study were 45 native English speakers (38 females, mean age 24.2, range 18-38) who were recruited from the University of Kansas (n = 34), University of Florida (n = 10), and the University of Georgia (n = 1).[9] Data was

[9] Eight of the L2 participants reported having grown up bilingual with English and another language; experimental group: Greek (n = 1), Arabic (n = 1), Telugu (n = 1), Malay (n = 1); control group: Romanian (n = 1), Cantonese (n = 1), Farsi (n = 1), Urdu (n = 1).

collected from one additional participant but was excluded due to having learned English as an L2 in school. All of the L2 participants reported having taken at least a 200+ level university Spanish course (roughly intermediate level), and 9 participants reported having had immersion experience in a Spanish-speaking country. The L2 learners were at an intermediate level, based on scores from a vocabulary measure (LexTale-Esp; Izura, Cuetos, & Brysbaert, 2014). This vocabulary measure was used to assess proficiency as it is quick for participants to complete (about 10 minutes), thus ensuring a higher response rate for participants that responded to an initial interest survey, and has also been shown to correlate with proficiency self-ratings (Izura et al., 2014) as well as with other measures such as cloze paragraph-completion tasks (Feroce et al., 2019). A *t*-test showed that there was no difference in proficiency levels between the experimental and control groups ($t(43) = -0.011$, $p = .991$). All participants provided informed consent prior to beginning the study. The L2 Spanish learners received a $20 Amazon gift card for their participation and the native Spanish speakers received a €20 Amazon Spain gift card. Summary descriptions of the L2 participants is shown in Table 3.

Table 3

L2 speaker information

	Months Abroad	LexTale (max. 60)
Experimental group (n = 22)	*M* = 5.63, *SD*: 4.50 (1.5-10)	*M* = 12.3, *SD*: 9.6 (-5-28)
Control group (n = 23)	*M* = 4.1, *SD*: 3.44 (1.5-10)	*M* = 12.3, *SD*: 9.6 (-4-31)

Self-Paced Reading

In the self-paced reading task, participants read two-sentence discourses that contained either a null pronoun or overt pronoun, and which referred back to a salient antecedent (the

syntactic subject) or a non-salient antecedent (the syntactic object) in a preceding contextual lead-in sentence (Feroce et al., 2019; Gelormini-Lezama & Almor, 2011, 2014). A total of 36 two-sentence discourses were constructed based off the materials from Feroce et al. (2019). Example sentences are provided in Table 4. See Appendices C and D for a full list of stimuli.

Table 4: Self-paced reading target stimuli
Table 4

Self-paced reading target stimuli example

	Subject (NP1) Reference	Object (NP2) Reference
9. Null Pronoun	a.) Alejandro dejó a Marta en casa. Estaba frustrado. *Alejandro left Marta at home.* *NULL was frustrated (masculine).*	b.) Marta dejó a Alejandro en casa. Estaba frustrado. *Marta left Alejandro at home.* *NULL was frustrated (masculine).*
10. Overt Pronoun	a.) Alejandro dejó a Marta en casa. Él estaba frustrado. *Alejandro left Marta at home.* *He was frustrated (masculine).*	b.) Marta dejó a Alejandro en casa. Él estaba frustrado. *Marta left Alejandro at home.* *He was frustrated (masculine).*

Each discourse contained a lead-in sentence with two proper name NPs of different genders and a target phrase that contained either a null pronoun (9a, 9b) or an overt pronoun (10a, 10b) describing one of the characters from the lead-in sentence. Proper name NPs were selected based on the top male and top female names from Spain and Argentina between the years 1980 and 1999. For the lead-in sentences, 18 unique verbs were chosen (repeated twice). Feroce et al. (2019) strictly used verbs that were previously shown to have no significant bias toward referring back to NP1 or NP2, as determined by a previous norming study with native Spanish speakers (Goikoetxea, Pascual, & Acha, 2008). However, inspection of native speaker reading times for each individual item showed that only a subset of items showed the predicted direction of effects (null pronouns read faster with subject than object antecedents, and overt pronouns read faster with object than subject antecedents). Thus, in the current study, the lead-in sentences contained a mix of verbs, including 9 non-biased verbs from Goikoetxea et al. (2008)

and 9 other verbs that the researcher judged as having no strong semantic bias (e.g. *estudiar con, besar a*). The target sentence of each discourse contained the verb *estaba* 'was' and a gender-marked adjective so that reference to the subject or object of the lead-in sentence was always unambiguous. A total of 36 unique adjectives were selected and the majority of these (27/36) came from a frequency corpus for Spanish learners (Davies, 2006). Antecedent reference was split evenly across items between being either the subject or object of the lead-in sentence as well as between being a male NP or female NP. Finally, target sentences were divided into four lists based on a Latin-square design so that no participant saw more than one version of a sentence. Participants saw each item twice between the pre-test and post-test, but in different conditions.

Given that sentence length differences between the presence of a null pronoun or overt pronoun could potentially account for reading time differences, reading times for each referent form are compared when it refers to a subject antecedent and when it refers to an object antecedent. This can shed light on whether the natives and learners are sensitive to context for each referent form, based on if processing is different between whether the referential form is used to refer to a subject or object. These length-controlled comparisons may be referred to as indexing context sensitivity. For example, evidence of context sensitivity for overt pronouns would emerge as slower reading times and lower ratings when referring back to a subject NP (10a) than an object NP (10b). If no differences emerged, this would suggest that speakers overextend overt pronouns to both salient and non-salient antecedents.

A total of 72 two-sentence filler discourses were also created (36 in pre-test, 36 in post-test). There were three types of fillers; for each type, the first sentence contained one or two (different-gender) proper name NPs, and the second sentence contained either a null pronoun, the

overt third-person plural pronoun *ellos*, or a plural NP. Filler Types 1 and 2 were balanced for the number of null and overt subjects. Examples are provided in Table 5.

Table 5

Examples of self-paced reading filler items

11. Type 1	Margarita se encontró a Joaquín fuera del colegio. Caminaron juntos a casa. *Margarita found Joaquín outside of the school.* *NULL walked home together.*
12. Type 2	Marcela era maestra de una escuela en Chicago. Los alumnos allí eran inteligentes. *Marcela was a teacher at a school in Chicago.* *The students there were smart.*
13. Type 3	Catalina y Tomás tenían que mudarse. Ellos se fueron para Barcelona. *Catalina and Tomás had to move.* *They left for Barcelona.*

Every target and filler trial was followed by a yes/no comprehension question after the second sentence, but these never targeted the pronoun. These were balanced between asking about the first sentence or the second sentence, as well as whether they required a yes or no answer. For the target items, participants saw a different comprehension question between the pre-test and the post-test. A full list of the comprehension questions is provided in Appendix E, and examples for both target items and fillers are presented in 14 and 15 below (respectively):

14. Alejandro dejó a Marta en casa. Estaba frustrado.

    'Alejandro left Marta at home. He was frustrated.'

    Was he frustrated? (Yes/No)

15. Margarita se encontró a Joaquín fuera del colegio. Caminaron juntos a casa.

    'Margarita found Joaquín outside of the school. They walked home together.'

    Did they walk to the airport together? (Yes/No)

Sentence-Selection Task

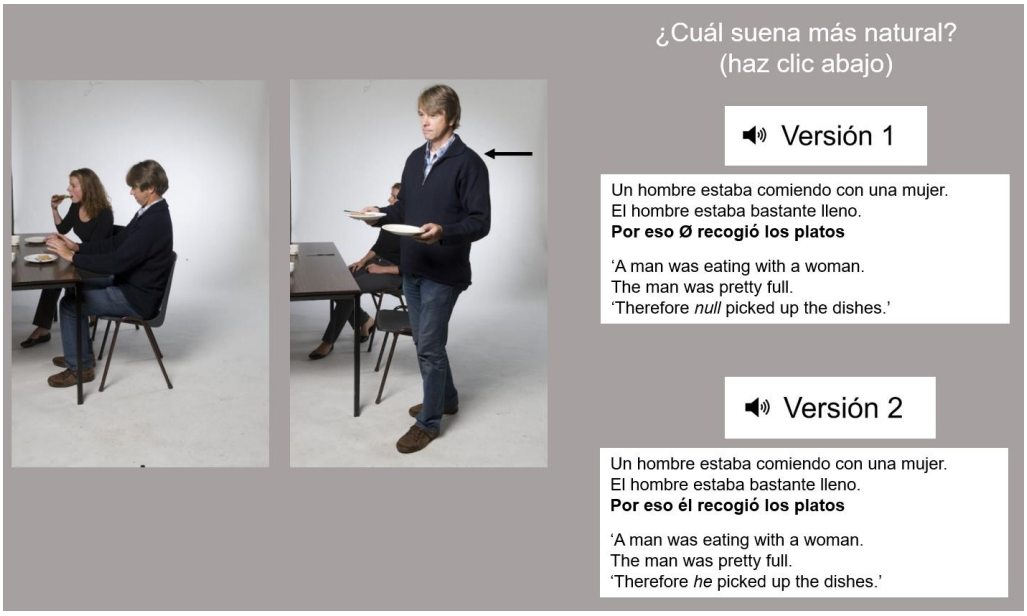
Previous research has shown that L2 learners may differ in whether they show sensitivity to syntax-discourse interface properties during online processing versus in untimed measures (e.g. Feroce et al., 2019; Roberts et al., 2008). One possible explanation is that online processing is cognitively demanding for L2 learners. That is, it possible that L2 Spanish learners are sensitive to the discourse properties of Spanish pronouns similar to native speakers, but this may only be seen in an untimed measure. In this dissertation, a sentence-selection task was used as a measure of offline comprehension to help address this possibility. In the sentence-selection task, participants heard two-versions of a three-sentence discourse with accompanying images. Participants had to listen to both versions of the discourse twice and then decide which version was the more natural description of the scene based on the images and the discourse context. Specifically, the two versions of each discourse only differed in the presence of a null pronoun or overt pronoun in the third sentence, and could either refer back to an immediately preceding NP (subject-continuation; Continue) or back to one mentioned at the beginning of the discourse (subject-shift; Shift).

The stimuli and images were based on a study by Vogels et al. (2013) and a total of 16 three-sentence target discourses were constructed. Each discourse contained a lead-in sentence introducing two characters of different genders, and was always ‘A woman,’ ‘A man,’ ‘A girl,’ or ‘A boy.’ The gender of the characters was balanced across items as being the grammatical subject or the object of the prepositional phrase *con* ‘with.’ In the second sentence, the subject of the first sentence was rementioned. Finally, the third sentence contained either an overt pronoun or a null pronoun and described someone as carrying out an action. Participants heard the discourses but did not see them in written text. The images were slightly modified from Vogels

et al. (2013) such that an arrow was added to point to the individual completing the action in the second image. This was done so that the third sentence, particularly with null pronouns, was disambiguated by the visual context. Additionally, some images contained a modified or added object to the picture to help illustrate the discourse (e.g. an Exit sign to illustrate someone leaving). All pictures were used with permission from the author of the original study (J. Vogels, personal communication, January 21, 2019). All images presented in this dissertation are shown with permission from the author (J. Vogels, personal communication, March 31, 2021). Consider Figures 1 and 2 below (Spanish and English transcriptions are provided here for clarity). Full descriptions of the images used in the task are provided in Appendix F, as well as the discourses for both target and filler items in Appendix G and H.

Figure 1

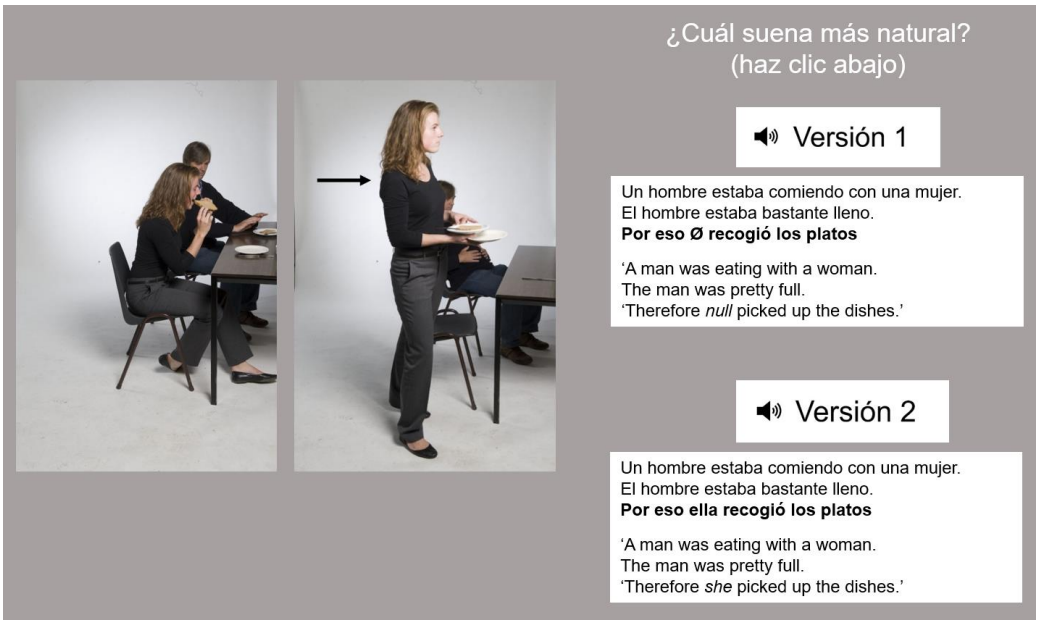
Example of Continue item in sentence-selection task



Note. Critical sentence is presented in bold. Images used with permission from the author.

Figure 2

Example of Shift item in sentence-selection task



Note. Critical sentence is presented in bold. Images used with permission from the author.

In the discourses in Figures 1 and 2, *Un hombre* 'A man' is the subject in both the first sentence and the second sentence, and thus is established as the discourse topic. Additionally, the two versions of each discourse only differ in whether the last sentence contains a null pronoun (Version 1) or an overt pronoun (Version 2). The difference between the subject-continuation condition (Figure 1) and the subject-shift condition (Figure 2) is based on who is completing the action in the second picture. In each condition, the choice of the null pronoun or overt pronoun discourse as the more pragmatically appropriate option is determined by which character is completing the action in the second image. In Figure 1, the subject-continuation condition, the boy is shown carrying out the action. Since this character is also the same as the established discourse topic, participants would be expected to choose the null pronoun option. The choice of the overt pronoun option would be pragmatically over-informative since a more minimal referent

form, the null pronoun, tends to be used to continue to refer to a prominent discourse entity. In Figure 2, the subject-shift condition, the girl is depicted as completing the action. Since she was only mentioned once at the beginning of the discourse, and also in a syntactically non-salient position (the object of a prepositional phrase), participants would be expected to choose the overt pronoun option to mark a change in reference away from the already established discourse topic *el chico.* The choice of the null pronoun would be pragmatically under-informative since it could potentially refer to either character on the basis of syntactic properties alone, and the overt pronoun is used typically to signal a change in reference. The order of whether the null pronoun option or overt pronoun option were presented first was counterbalanced across items to prevent participants from adapting any potential task strategies. Participants saw the same 16 target items in the pre-test and the post-test, but presented in different conditions.

Participants also saw 4 filler items in the pre-test and 4 different filler items in the post-test to ensure that they were paying attention to the task. Crucially, none of the fillers targeted the null/overt pronoun distinction. Half the filler items contained two characters and half contained one character. In each filler item, the first sentence introduced the characters, while the second sentence was a description of the scene and contained an impersonal or inanimate subject (e.g *Era* ‘it was’; *La relación* ‘the relationship’). The third sentence was manipulated to be either an accurate description of the scene or not. Examples are provided in Figures 3 and 4.

Figure 3

Example of filler item (one character) in sentence-selection task

Note. Critical sentence is presented in bold. Images used with permission from the author.

Figure 4

Example of filler item (two characters) in sentence-selection task

Note. Critical sentence is presented in bold. Images used with permission from the author.

The correct answer in each filler item was the semantically true description of the scene displayed. In Figures 3 and 4, this is Versions 1 and 2 (respectively).

Recordings for the sentence-selection task were obtained from a female, native speaker of central Mexican Spanish (age 34 years old). The speaker was informed about the purpose of the experiment and was trained by the experimenter to use a relatively neutral prosody (including a slowed pronunciation and enunciation of words for clarity for the L2 participants). Specifically, the speaker was shown a PowerPoint presentation on the experimenter's laptop, which included the different scenes from the sentence-selection task. Sentences in each discourse were presented visually one at a time and presentation rate was controlled by the experimenter. Recordings from the speaker were obtained using a Logitech USB H390 headset with noise-cancelling microphone, and were recorded in Praat (Boersma & Weenink, 2017) at a 48 kHz sampling rate.

For the sentences containing an overt pronoun, the speaker was instructed to use a contrastive focus intonation for both the Continue and Shift conditions in order to eliminate the possibility of prosodic differences accounting for different performance between conditions in the actual experiment. The third sentence in each discourse was recorded in three different versions: null pronoun (same between Continue and Shift conditions), overt pronoun for Continue condition, and overt pronoun for the Shift condition. In order to prevent the possibility that prosodic cues (such as contrastive stress and emphasis) make one of the characters more prominent than another (see Rello & Llisteri, 2012), the two overt versions were recorded subsequently so that the prosody would be as similar as possible between conditions. Similarly, the same recording of the null pronoun version of sentence 3 was used in both Continue and Shift conditions to hold prosody constant across conditions. Additionally, the same recordings for sentences 1-2 were used in all versions and conditions for each discourse. Recordings were

obtained over 4 different occasions. Within each discourse, recordings for each sentence were manually spliced in Praat and intensity scaled to 70 dB (i.e. the average intensity of each sentence was set to 70 dB). From there, the researcher selected the best recordings on the basis of clarity and speed that would be suitable for low-intermediate level L2 learners. Once the best recordings were obtained, the experimenter manually concatenated together the three sentences in each discourse and added a 750ms pause between each sentence using Praat.

Training

Recent studies have combined methods from L2 language pedagogy with psycholinguistic techniques to study the acquisition of morphosyntactic properties (e.g. Dracos & Henry, 2021; Fernández-Cuenca, 2019; McManus & Marsden, 2017). However, it remains to be seen whether these methods can be extended to null/overt subject pronoun usage, a syntax-discourse property. The present study addresses this gap by incorporating explicit instruction about Spanish pronouns following methods of Processing Instruction (VanPatten, 1996). Specifically, learners were presented with explanations of the discourse constraints of null and overt pronouns, as well as comparisons with similar properties from their L1 (namely, overt pronouns and repetition of proper names). Additionally, they completed structured practice activities with corrective feedback. The instruction and practice activities are described below.

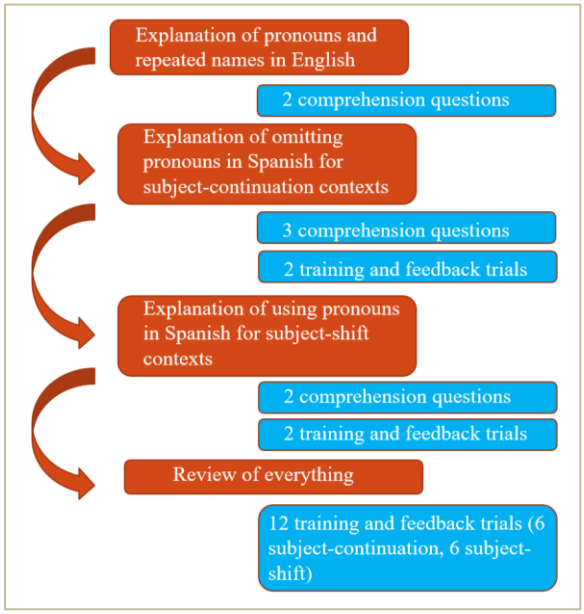
Instruction

The training for the experimental group consisted of explicit instruction about the discourse-pragmatic properties of null and overt subject pronouns in Spanish (full instruction slides are provided in Appendix A). While subject pronoun usage in Spanish is guided by multiple factors, this study centers in on just one variable: switch reference. Specifically, learners were taught about the notions of subject continuity and subject switch with 3rd person singular

masculine and feminine pronouns (*él* 'he', *ella* 'she'). The instruction was broadly organized into three topics based on explanations of pronoun usage in English, pronoun omission in Spanish, and pronoun usage in Spanish in subject-shift contexts. For each topic, example sentences and discourse contexts were provided to learners in text as well as audio recordings to contrast pronoun forms and pragmatically felicitous and infelicitous uses. Additionally, there were seven 'True/False' comprehension questions presented throughout the training that participants had to answer to ensure they were actively engaged in the task. The instructional topics are described in further detail below and a flowchart of the training for the experimental group is presented in Figure 5.

Figure 5

Flow chart of training for L2 Experimental group

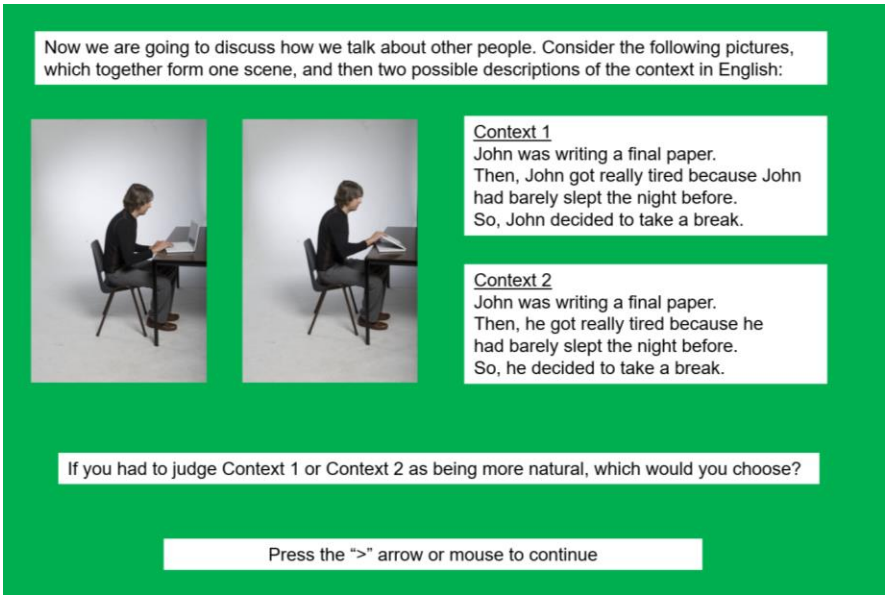


Participants in the experimental group were told that they would be learning about ways to talk about other people and about pronouns in Spanish. In the first section of training, learners were shown a discourse scenario in English with two similar descriptions that only differed in

whether a pronoun or a proper name was used. The learner was then prompted to think about which version sounded more natural to tap into their intuition about referent form and pragmatic informativity in their L1. Specifically, Feroce et al. (2019) found that L2 Spanish learners show sensitivity online and offline to repeated names, a property instantiated in their L1 (English), but not to null or overt pronouns. Thus, learners' attention was drawn specifically to repeated names in English as learners could potentially extend their knowledge of this form (McManus & Marsden, 2017, 2019b), including the pragmatic consequences of using an over-informative referential form, to the use of overt pronouns in Spanish, which patterns similarly to repeated names even for native Spanish speakers (Feroce et al., 2019; Gelormini-Lezama & Almor, 2011). This is shown in Figure 6.

Figure 6

Sample screenshot from training section on English pronouns



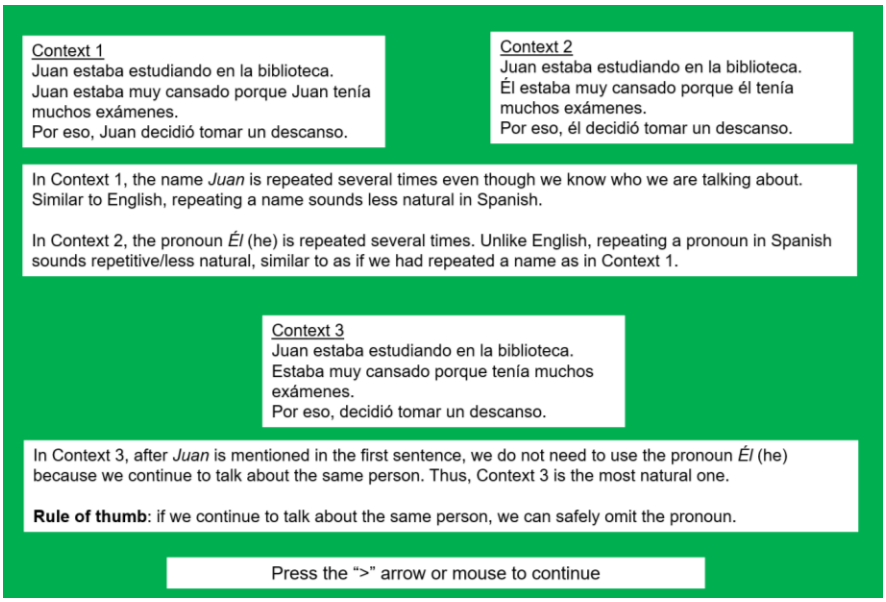
Note. Images used with permission from author.

Participants were then explicitly told that pronouns are words like ‘he’ and ‘she’ that can be used in place of nouns to avoid being repetitive in conversation. Additionally, they were told that a pronoun can be used when a speaker continues to talk about the same person.

Following the slides on English pronouns, participants were taught explicitly about the presence of null pronouns in Spanish. To avoid complexity related to new terminology, the term “null pronoun” was not used and was described instead in terms of pronoun omission. Learners were taught that pronouns can be omitted in Spanish when a speaker continues to refer to the same person, similar to how a pronoun is used in English, and that while using an overt pronoun to continue to talk about the same person is grammatically acceptable in Spanish, it sounds repetitive and less natural compared to a null pronoun. Participants were also told that gender-marking information may help clarify who is being referred to. Additionally, learners’ attention was specifically brought to learner pronoun usage strategies. Specifically, they were told that since native speakers of English are used to a subject always being used, they might want to use a pronoun to be as clear as possible and in fact is a common strategy that both Spanish learners and some Spanish teachers use. Finally, the learners were told that repeatedly using a pronoun in Spanish is unlike in English, and results in sentences that sound less natural, similar to repeatedly using a name. This is a crucial point in the training design as it takes into account the finding by Feroce et al. (2019) that L2 learners show evidence of sensitivity to repeated names in Spanish. This comparison between repeated names and overt pronouns is also justified by the similar reading time (RT) patterns and ratings by native Spanish speakers in Feroce et al. (2019). An example is provided in Figure 7 below.

Figure 7

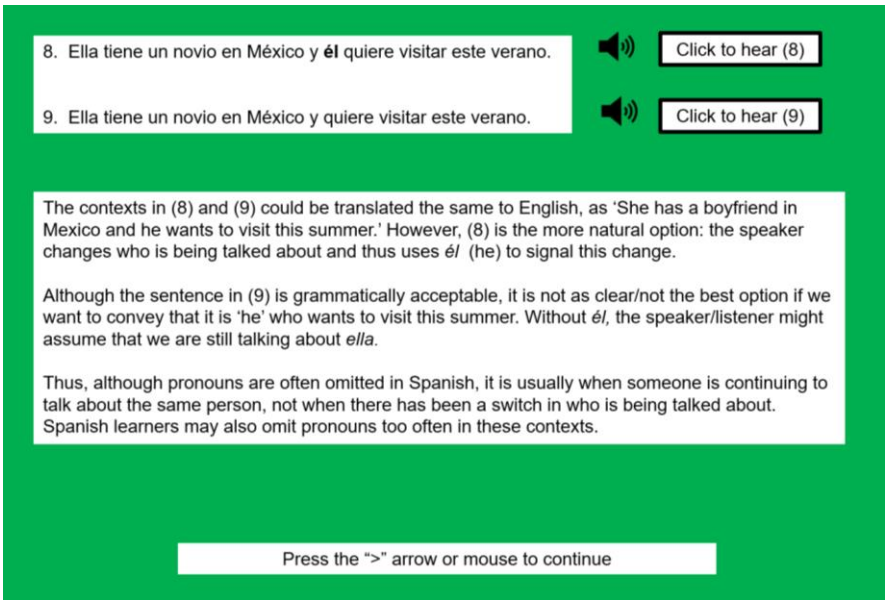
Sample screenshot from training section on null pronouns in Spanish



Following the section on null pronouns in Spanish, learners were taught about the pragmatically appropriate uses of overt pronouns in Spanish, namely in switch-reference contexts. They were told that pronouns are often used to indicate a change in who is being discussed and that using a null pronoun in such contexts, while grammatically acceptable, could cause potential confusion in who is being referred to. Even when other clues, such as gender-marking, may indicate who is being referred to, native Spanish speakers still tend to use overt pronouns in these contexts. Although this is a simplified explanation, it serves to narrowly focus learners' attention toward general native usage patterns while also addressing the presence of other reference disambiguation cues. Participants were also told that L2 Spanish learners may omit pronouns too often in these contexts. An example is provided in Figure 8 below.

Figure 8

Sample screenshot from training section on overt pronouns in Spanish



Practice and Feedback

Throughout the training, participants completed practice trials related to their comprehension of Spanish subject pronouns and were also given explicit feedback. These trials were the same versions of items from the sentence-selection task that participants had seen in the pre-test, except now the discourse scenarios were presented both in written text and aurally (following methods of Processing Instruction; VanPatten, 2002). Presentation of the training items were interspersed such that two trials were presented after each discourse condition being taught while the rest (12 in total) were presented at the end of the training instruction. These final trials were presented in a pseudo-randomized order, such that no more than two items from a single condition would be presented sequentially. Feedback for these trials consisted of either the expression *muy bien* ('very good') or an explicit explanation as to why a chosen answer was wrong. Examples of feedback provided for wrong answers is shown in Figures 9 and 10.

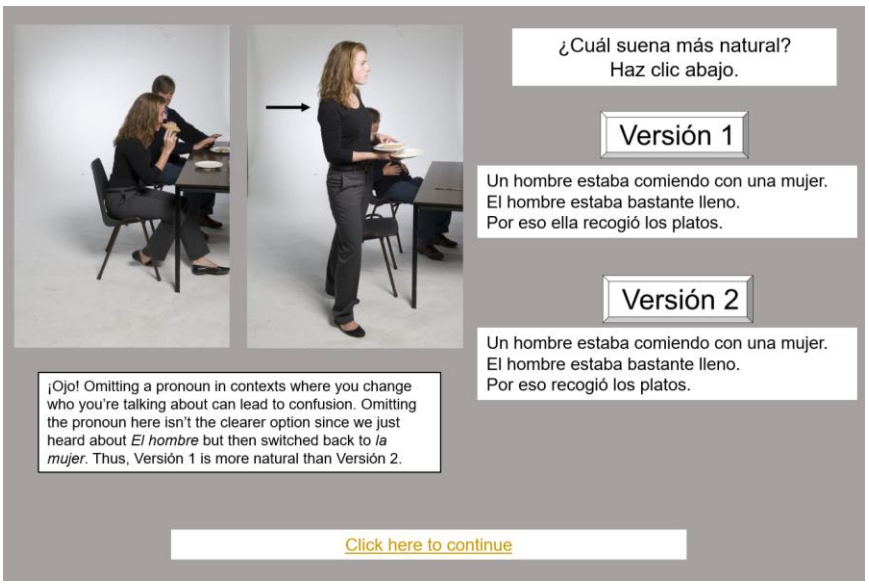
Figure 9

Sample screenshot of corrective feedback for a Continue context training trial

Note. Images used with permission from the author.

Figure 10

Sample screenshot of corrective feedback for a Shift context training trial



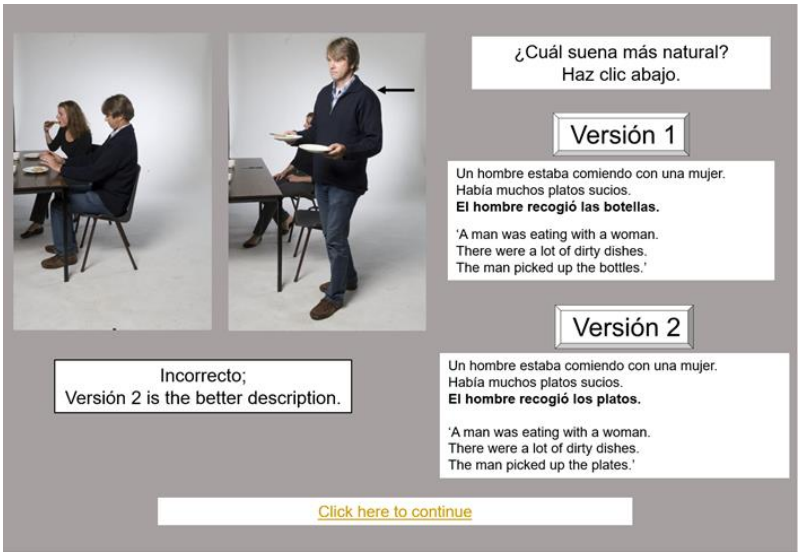
Note. Images used with permission from the author.

As can be seen in Figures 9 and 10, the corrective feedback included an explanation as to why a particular answer was wrong. This explicit feedback served to clarify to the learner the pragmatic context of the discourse (e.g. subject continuation) and the pragmatic consequences of using the dispreferred pronoun form in that context.

The L2 Control group did not receive explicit instruction about Spanish pronouns and instead completed an unrelated task. They were told that they would see and hear discourse scenes similar to the pre-test, but would have to decide which version best describes the scene. Specifically, L2 learners in the control group saw the same scenes from the pre-test sentence-selection task, but with altered discourses that followed the same structure as the filler items from the experimental task. That is, the two discourse versions for each item differed in whether or not they accurately described the scene depicted. They were also given feedback for their answers, with *muy bien* for correct answers, and a brief sentence for wrong answers. An example of feedback for the L2 Control group is provided in Figure 11 below (English translation is provided here for clarity); see Appendix I for full list of stimuli.

Figure 11

Sample screenshot of feedback for the L2 Control group



Note. Images used with permission from the author.

As can be seen from Figure 11 above, corrective feedback for the L2 Control group did not explain why one answer was better than another. However, participants were not expected to have any particular difficulty with this task as the difference between versions is based on differences in semantic description of the scene in the third sentence. In the example in Figure 11, the third sentence in Version 1 states that 'The man picked up the bottles' while in Version 2 it is 'The man picked up the plates/dishes.' Finally, the native Spanish speakers did not complete any training or distractor task between the pre-test and post-test.

Predictions

If L2 learners can evaluate antecedent salience and use discourse constraints in the comprehension and processing of Spanish null and overt subject pronouns, they will follow similar patterns as the native speakers. These specific patterns are outlined below for each referent form, along with predictions for theoretical accounts that predict difficulty. Additionally, an effect of training would emerge as more nativelike sensitivity in the self-paced reading and sentence-selection tasks in the post-test than the pre-test, and this effect would be seen for the L2 Experimental group but not the L2 Control group. The stimuli from Table 3 are repeated below for the reader's convenience.

Table 3 (repeated)

Self-paced reading target stimuli example

	Subject (NP1) Reference	Object (NP2) Reference
9. Null Pronoun	a.) Alejandro dejó a Marta en casa. Estaba frustrado. *Alejandro left Marta at home.* *NULL was frustrated (masculine).*	b.) Marta dejó a Alejandro en casa. Estaba frustrado. *Marta left Alejandro at home.* *NULL was frustrated (masculine).*
10. Overt Pronoun	a.) Alejandro dejó a Marta en casa. Él estaba frustrado. *Alejandro left Marta at home.* *He was frustrated (masculine).*	b.) Marta dejó a Alejandro en casa. Él estaba frustrado. *Marta left Alejandro at home.* *He was frustrated (masculine).*

Null Pronouns: If native speakers and learners show evidence of context sensitivity during online processing for null pronouns, they should show longer reading times when the null pronoun refers to the object of the preceding sentence (9b) than to the subject (9a). This pattern is predicted by the Informational Load Hypothesis because less explicit referent forms should be more difficult to process when referring back to non-salient than salient antecedents. Additionally, offline sensitivity to null pronouns would emerge in the sentence-selection task as high accuracy in the Continue condition, where a null pronoun is expected based on native

preference to use null pronouns when maintaining reference to the same subject in discourse (e.g. Cameron, 1992). If L2 learners have difficulty with the integration of discourse-pragmatic properties, we expect no significant differences in reading times for nulls between subject and object antecedents, and chance performance (50%) for Continue contexts in the sentence-selection task. Although the Interface Hypothesis predicts that near-native L1 English L2 Spanish learners will have difficulties specifically with overt pronouns, previous studies with lower proficiency learners (intermediate to advanced) have shown that difficulties arise with null pronouns (e.g. Clements & Domínguez, 2017; Rothman, 2009). Thus, in line with previous studies, if intermediate-advanced learners have general difficulty with discourse integration, difficulties may arise with null pronouns.

Overt Pronouns: If native speakers and learners show evidence of context sensitivity during online processing for overt pronouns, they should show longer reading times when the overt pronoun refers to the subject of the preceding sentence (10a) than to the object (10b). In line with the Informational Load Hypothesis, more explicit forms should be more difficult to process when referring back to salient than non-salient antecedents. Additionally, offline sensitivity to overt pronouns would emerge in the sentence-selection task as high accuracy in the Shift condition, where an overt pronoun is expected based on native tendencies to use overt pronouns when switching reference from the previously-mentioned subject in discourse (Carvalho, Orozco, & Shin, 2015). If L2 learners have difficulty with the integration of discourse-pragmatic properties, we expect no significant differences in reading times for overt pronouns between subject and object antecedents, and chance performance (50%) for Shift contexts in the sentence-selection task.

Procedure

The L2 participants were recruited via email and word-of-mouth from 3rd and 4th semester Spanish courses at the University of Kansas, University of Florida, and University of Georgia. The native Spanish speakers were also recruited via email and word-of-mouth from instructors in the Department of English Philology at the University of Granada (Granada, Spain). All participants that expressed interest in the study first completed an initial interest questionnaire in *Qualtrics*, including an informed consent statement, a vocabulary measure to gauge proficiency, and questions about general availability during the week and preferred dates for the experiment. This initial survey took about 10 minutes and the experimenter emailed participants that expressed interest.

The entire experiment was conducted over the internet via experiment links sent to participants. The experimental tasks themselves were presented via PsychoPy3 (Peirce et al., 2019; https://www.psychopy.org/) and implemented in Pavlovia.org, which allows for experiments to be uploaded as repositories in Gitlab, and for experiment tasks to be administered as internet links that can be sent to participants. The use of PsychoPy3 was chosen to implement this internet-based experiment as time-sensitive measurements, particularly RTs with visually-presented stimuli, have been shown to be largely comparable in precision to RTs obtained in lab-based psychological testing software (Gallant & Libben, 2019) and even slightly advantageous compared to other online, psychological testing platforms (Bridges, Pitiot, MacAskill, & Peirce, 2020). Additionally, PsychoPy is an open-source software with a large online forum for addressing technical issues or questions about experiment presentation (https://discourse.psychopy.org). Following best practices suggested by Gallant and Libben (2019), the experimental tasks were piloted on both Windows and Mac operating systems.

Additionally, for the actual experiment, participants were encouraged to use Google Chrome, close any open tabs or files besides their email, make sure their laptop was charged, use headphones if possible, and to complete the study in a quiet space without distractions.

Participants first met with the experimenter via a password-protected Zoom link in order to receive instructions about the experiment as well as a participant code for data anonymization. The experimenter communicated with the L2 Spanish learners in English and with the native Spanish speakers in Spanish to ensure that all the instructions were clear. Additionally, the L2 participants were sent a vocabulary list to review before for the experiment to make sure they were familiar with the adjectives, verbs, and nouns used in the different tasks. In the first part of the experiment, participants were sent two links to their email which contained the self-paced reading task and sentence-selection task (completed in this order). Before beginning the tasks, the participant and experimenter logged off of Zoom so as to prevent any potential interference in data recording, and participants were instructed to log back into Zoom whenever they finished or around 40 minutes after the initial Zoom call. For the self-paced reading task, participants were told that they would be silently reading short stories in Spanish and answering questions. They first completed six practice trials that followed the same format as the filler sentences. In each trial, a fixation cross appeared in the center of the screen for 1 second. Then, the first sentence was presented automatically and participants had to click the space bar in order to see the second sentence and then again to see the comprehension question, which they answered by pressing ‘s’ for “Sí” (‘yes’) or ‘n’ for “No.” Three breaks were offered to participants, and the task took participants around 15 minutes to complete. Reading times were measured from the time the participant saw the second sentence until they clicked to see the question. Fillers and targets were presented in a randomized order. For the sentence-selection task, participants were

told that they would be viewing pictures and listening to two descriptions of the scene which were very similar and that had a slightly different wording in the third sentence. The different audio descriptions were played back-to-back, and this was repeated twice so that learners would be able to better comprehend the discourse (i.e. each version was played twice). Participants were also instructed to select (via mouse click) the version that a native Spanish speaker would most likely say for each scene. They first completed three practice trials that followed the same design as the filler sentences and did not target pronouns or reference. A break was offered halfway through, and in total the task took about 20 minutes.

After completing the first two experiment links, participants logged back into Zoom to meet the experimenter for the training session (for the natives, this consisted of a brief check-in to ensure that the previous experiment links had worked). The training PowerPoint presentations were uploaded into the experimenter's Dropbox and then sent as a link in Zoom which participants downloaded to their computer. This was done to avoid any potential errors that could arise from running a PowerPoint file with audios over the internet. Additionally, participants were informed that the experimenter would stay on Zoom to take a few notes and to also record participant answers to the comprehension questions, as these did not involve explicit feedback and participants had to verbally provide their answers to the experimenter. To do this, participants used the screen-share feature in Zoom so the experimenter could record answers for the training and feedback trials (which involved mouse clicks rather than providing verbal responses as for the comprehension questions). The experimenter turned off their own camera and microphone while participants completed the training task in order to minimize any potential anxiety performance by participants. This training took about 15 minutes and once finished, participants were told they could delete the PowerPoint from their computer as it would not be

needed for the rest of the experiment. After this, the experimenter sent participants two more links to their email, containing the post-test versions of the self-paced reading and sentence-selection tasks. The procedures for the post-test tasks were the same as in the pre-test and took participants about 30 minutes to complete. Finally, after completing the post-test tasks, the experimenter and participant completed a third and final Zoom call. In this final Zoom call, participants were sent a link to the language background questionnaire via *Qualtrics*, which also included a debriefing statement about the purpose of the study, and this took participants about 10 minutes to complete. Overall, the experiment took about 1 hour 45 minutes for the L2 learners and 1 hour 30 minutes for the native speakers.

Data Processing

For the sentence-selection task, pre-test data from one participant (experimental group) was not included in the analyses due to a technical error causing the file not to be saved. For the self-paced reading task, raw reading times were first preprocessed to exclude any trials with incorrect responses to the comprehension questions. This led to an average of 1.46% being excluded for the native speakers (1.32% pre-test, 1.59% post-test), 4.80% for the L2 Experimental group (4.92% pre-test, 4.67% post-test), and 4.17% for the L2 Control group (3.86% pre-test, 4.47% post-test). For each participant, trials were excluded for reading times that were 2 standard deviations below or above an individual's average reading time per condition in the pre-test and post-test separately, as individuals tended to read faster in the post-test. This resulted in an additional 4.76% of the data being excluded for the native speakers (4.63% pre-test, 4.89% post-test), 4.04% for the L2 Experimental group (4.04% pre-test, 4.04% post-test), and 4.95% for the L2 Control group (4.23% pre-test, 5.68% post-test).

Chapter 5: Results

Behavioral Data from Training

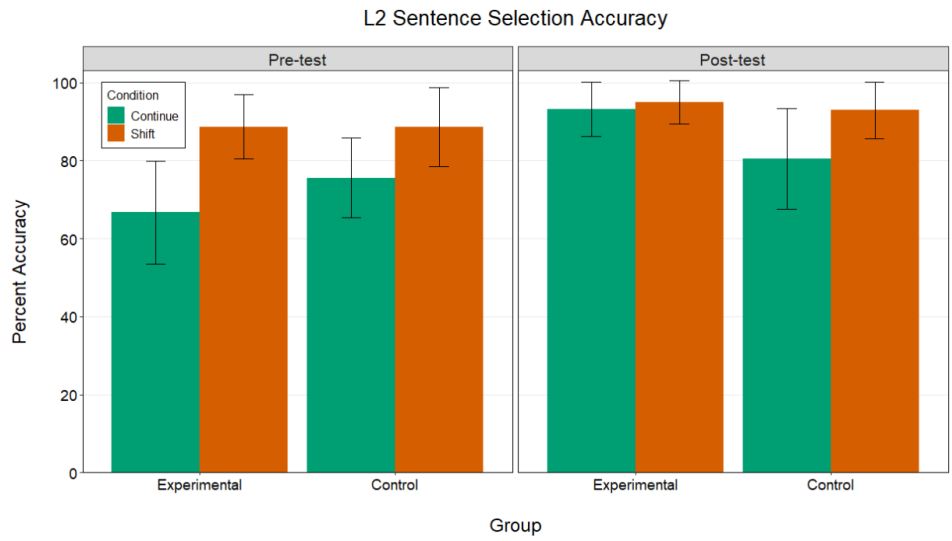
The L2 participants in the experimental group were highly accurate during training. The comprehension questions were answered nearly at ceiling at 98.30% (*SD*: 3.94%, 87.5-100*%)*. Additionally, participants answered the training trials (where feedback was provided) at 98.70% (*SD*: 6.09%, 71.43-100%). This shows that participants in the experimental group were actively engaged in the training task. Participants in the control group also were highly accurate in the non-pronoun related version of this secondary task, with an average accuracy of 99.73% (*SD*: 1.30%, 93.75-100%).

Sentence-Selection Task: L2 learners

The L2 participants showed improvements in accuracy on the sentence-selection task from the pre-test (79.97%, *SD*: 17.55%, 37.50-100%) to the post-test (90.28%, *SD*: 16.57%, 43.75-100%), as can be seen in Figure 12.

Figure 12

Average accuracy in the Sentence-Selection task for the L2 Spanish speakers



Note. Bars represent 95% confidence interval

Accuracy data was statistically analyzed using logistic mixed effects models via the *glmer* function in *R.* The results for the model below reveal the likelihood that a learner would select the correct discourse version in each trial (null pronouns for the continue condition, overt pronouns for the shift condition). Fixed effects included Time (Pre-test [reference], Post-test), Group (Experimental [reference], Control), and Condition (Continue [reference], Shift), as well as all two-way and three-way interactions, and participant as a random intercept. Correct answers were coded as 1 and incorrect answers as 0, and fixed effects were dummy coded. Statistical comparisons across experimental conditions were interpreted based on releveling of the reference levels for each independent factor in the regression equation. Significance of fixed effects were assessed using likelihood-ratio tests, by comparing models with and without each factor (Meteyard & Davies, 2020). The equation used in *R* is provided below and full model output is included in Appendix B.

Accuracy ~ Group*Time*Condition + (1|Participant)

The analysis showed a significant three-way interaction between Time, Group, and Condition ($\chi^2(1) = 4.158$, $p = .041$). This revealed that in the pre-test there was no difference in accuracy between the experimental and control groups for the Continue condition ($\beta = 0.633$, $SE = 0.482$, $z = 1.313$, $p = .189$) or the Shift condition ($\beta = 0.133$, $SE = 0.548$, $z = 0.242$, $p = .808$), but that in the post-test the experimental group was more accurate than the control group for the Continue condition ($\beta = 1.272$, $SE = 0.557$, $z = 2.284$, $p = .022$) but not the Shift condition ($\beta = 0.217$, $SE = 0.627$, $z = 0.346$, $p = .730$). The lack of group differences for the Shift condition may be due to a ceiling effect in high accuracy scores.

Comparisons across conditions revealed higher accuracy for the Shift than Continue condition for the control group in both the pre-test ($\beta = 1.172$, $SE = 0.320$, $z = 3.667$, $p < .001$)

and post-test (β = 1.401, *SE* = 0.367, *z* = 3.814, *p* < .001), whereas for the experimental group this pattern was significant in the pre-test (β = 1.672, *SE* = 0.323, *z* = 5.182, *p* < .001) but not the post-test (β = 0.346, *SE* = 0.473, *z* = 0.731, *p* = .465). This shows that the experimental group was performing just as well in the post-test for Shift conditions than Continue conditions. Additionally, the experimental group was more accurate for Continue conditions in the post-test than pre-test (β = 2.285, *SE* = 0.372, *z* = 6.138, *p* < .001) but the control group was not (β = 0.380, *SE* = 0.286, *z* = 1.330, *p* < .183). The experimental group was also more accurate in the Shift conditions in the post-test than the pre-test (β = 0.959, *SE* = 0.442, *z* = 2.170, *p* = .030) but the control group was not (β = 0.609, *SE* = 0.390, *z* = 1.564, *p* = .118).

The role of proficiency was also analyzed based on centered LexTale scores using the *scale* function in *R* (subtracting the mean LexTale score across all participants from each individual's raw Lextale score). Model-fitting began by maximally including all main effects and interactions including Time (Pre-test, Post-test), Group (Experimental vs. Control), Condition (Continue vs. Shift) and Proficiency as fixed factors, as well as a random intercept of participant. Removal of the interactions with Proficiency did not reduce model fit (all χ^2 < 3.921, all *p* > .349), however the removal of the main effect of Proficiency did ($\chi^2(8)$ = 16.757, *p* = .033). The regression analysis revealed that overall, participants were more accurate on the sentence-selection task the higher their proficiency level (β = 0.692, *SE* = 0.206, *z* = 3.363, *p* = .001). Full model output is provided in Appendix B.

Sentence-Selection Task: Native Spanish

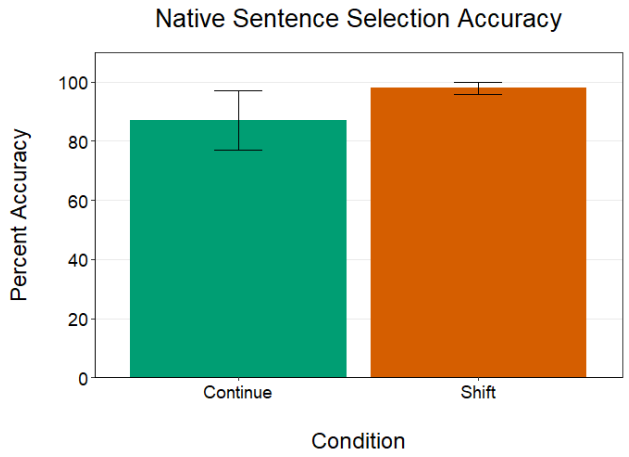
The native Spanish speakers were highly accurate in the sentence-selection task. As can be seen from Figure 13, participants showed an average of 86.9% (*SD*: 22.9% , 12.5-100%) accuracy in the Continue condition and 97.9% in the shift condition (*SD*: 4.6% , 12.5-100%). A

logistic mixed-effects model was ran in *R* following the same methods as the L2 speakers, but with only one fixed effect of Condition (Continue [reference], Shift), and participant as a random intercept. Time was not entered as a fixed effect due to the lack of specific predictions since native speakers did not complete a training session.

Accuracy ~ Condition + (1|Participant)

Figure 13

Average accuracy in the Sentence-Selection task for the native Spanish speakers



Note. Bars represent 95% confidence interval

This analysis revealed that native speakers were more accurate for Shift than for Continue conditions (β = 2.412, *SE* = 0.466, *z* = 5.174, *p* < .001). While this difference was not expected, it more accurately reflects the variable nature of overt pronoun expression in subject-continuation contexts.

Sentence-Selection Results Summary

Overall, the results from the sentence-selection task suggest that L2 learners show offline sensitivity to the discourse conditions associated with null and overt subject pronouns in Spanish and that this sensitivity increases after explicit training. Additionally, in contexts of subject continuation, both learners and native speakers show more varied responses (in this task,

accuracy) with the choice of a null or overt pronoun compared to contexts of subject shift. I return to possible interpretations of this in the Discussion.

Self-Paced Reading: L2 learners

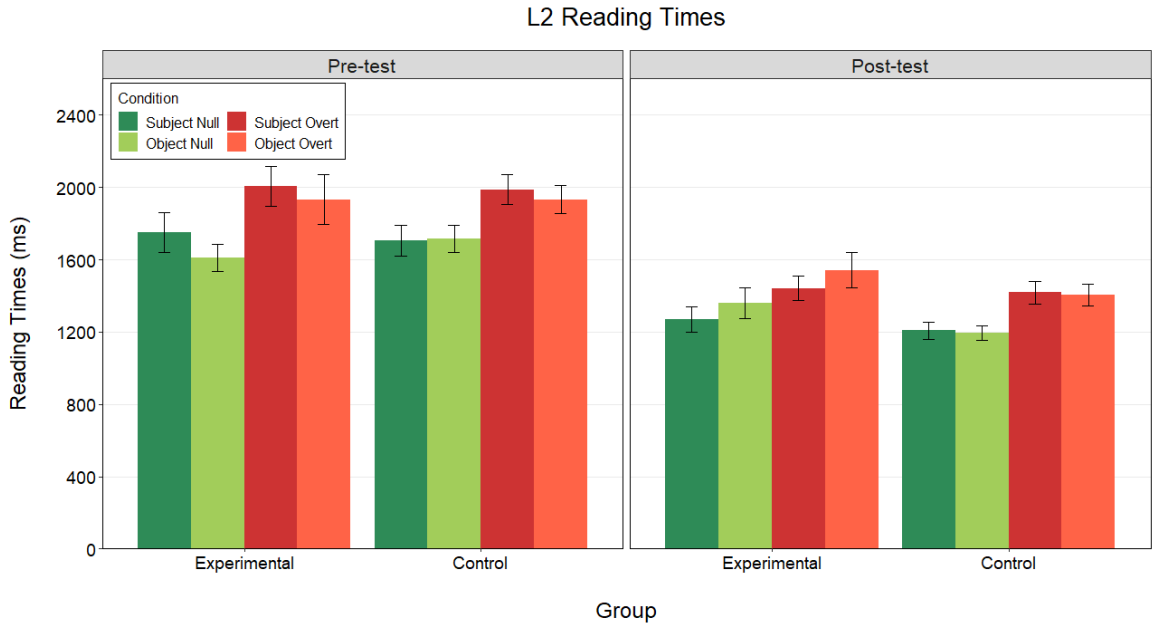
In the self-paced reading task, reading times from the second sentence for each item were analyzed using linear mixed effects models via the *lmer* function in *R* (R Core Team, 2017). Fixed effects were dummy coded and included Time (Pre-test [reference], Post-test), Group (Experimental [reference], Control), Antecedent (Subject [reference], and Referent Form (Null Pronoun [reference], Overt Pronoun), as well as all interactions, and participant and item as random intercepts. Statistical comparisons across experimental conditions were interpreted based on releveling of the reference levels for each independent factor in the regression equation. Significance of fixed effects were assessed using likelihood-ratio tests, by comparing models with and without each factor. The final model in *R* is presented below. The full output is included in Appendix B.

RT ~ Group*Time*Antecedent*Form + (1|Participant) + (1|Item)

The L2 speakers' reading times are represented in Figure 14. The analysis showed a significant main effect of Referent Form ($\chi^2(8) = 171.32$, $p < .001$) and Time ($\chi^2(8) = 739.17$, $p < .001$), but no other main effects or interactions between any of the factors (all $\chi^2 < 8.670$, all $p > .120$). The main effect of Referent Form revealed that sentences with null pronouns were read faster than sentences with overt pronouns (β = -234.438, SE = 18.100, t = -12.952, $p < .001$) and that participants read sentences faster in the post-test than in the pre-test (β = -504.053, SE = 18.135, t = -27.794, $p < .001$).

Figure 14

Mean reading times (ms) for the L2 Spanish speakers



Note. Bars represent 95% confidence interval

The role of proficiency was also examined based on centered LexTale scores using the *scale* function in *R* (subtracting the mean LexTale score across all participants from each individual's raw Lextale score). Model-fitting began by maximally including all main effects and interactions including Time (Pre-test, Post-test), Group (Experimental, Control), Antecedent (Subject, Object), Referent Form (Null Pronoun, Overt Pronoun), and Proficiency as fixed factors, as well as random intercepts of participant and item. There were no significant interactions with Group and Time, thus there is no evidence for the presence of a differential training effect based on L2 proficiency scores. A full model is provided in Appendix B.

Self-Paced Reading: Native Spanish

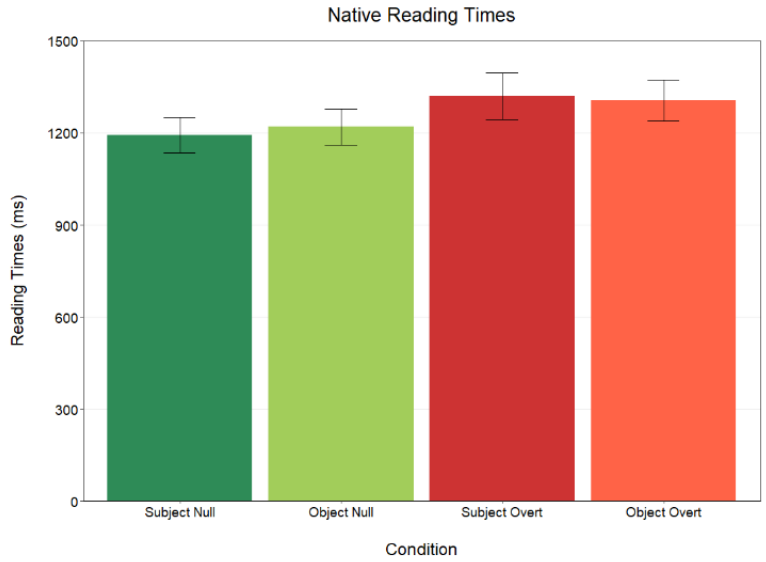
For the native Spanish speakers, reading times from the second sentence for each item were analyzed using linear mixed effects models via the *lmer* function in *R* (R Core Team, 2017). Fixed effects were dummy coded and included Antecedent (Subject, Object) and Referent Form (Null Pronoun, Overt Pronoun), as well as their interaction, and participant and item as random intercepts. Statistical comparisons across experimental conditions were interpreted based on releveling of the reference levels for each independent factor in the regression equation. Significance of fixed effects were assessed using likelihood-ratio tests, by comparing models with and without each factor. The final model is presented below and the full output is included in Appendix B.

RT ~ Antecedent*Form + (1|Participant) + (1|Item)

The native speakers' reading times are represented in Figure 15. The analysis showed a significant main effect of Referent Form ($\chi^2(2) = 13.593$, $p = .001$) but no significant effect of Antecedent ($\chi^2(2) = 0.701$, $p = .704$) or their interaction ($\chi^2(1) = 0.682$, $p = .409$). The main effect of Referent Form revealed that sentences with null pronouns were read faster than sentences with overt pronouns (β = -104.99, SE = 29.146, t = -3.602, $p < .001$). There was no significant difference in reading times between Subject antecedents and Object antecedents (β = 4.008, SE = 29.147, t = 0.137, $p = .891$). The lack of an interaction between Antecedent and Referent Form contrasts results by Feroce et al. (2019) and Gelormini-Lezama and Almor (2011, 2014), although it should be noted that the sample sizes in these prior studies are larger. For example, the study by Feroce et al. (2019) included 51 native Spanish speakers. Thus, it is possible that with future data collection similar patterns will emerge for the current experiment.

Figure 15

Mean reading times (ms) for the native Spanish speakers



Note. Bars represent 95% confidence interval

Self-Paced Reading Results Summary

Overall, the results from the self-paced reading task suggest that L2 learners do not show sensitivity online to discourse constraints of null and overt subject pronouns in Spanish, and that this does not significantly change after training. Specifically, there were no significant differences in reading times between subject and object antecedents for either null or overt pronouns. Additionally, there were no significant reading time differences based on antecedent for the native speakers, in contrast to results of previous studies (Feroce et al., 2019; Gelormini-Lezama & Almor, 2011, 2014), although the sample sizes between these studies greatly differ. I return to interpretations of the self-paced reading results in the Discussion.

L2 Correlation Analyses

Although the self-paced reading results indicated that there was no evidence of online sensitivity to the discourse constraints of null and overt pronouns, it is possible that individual variability can be better captured by examining the relationship between performance on the self-paced reading task and the sentence-selection task. That is, it may be that case that sensitivity to discourse features during online processing may be related to offline comprehension of these features. To explore this possibility, data from the self-paced reading task and accuracy on the sentence-selection task were examined together from all L2 participants based on pre-test data. In order to examine all the L2 participants together, only the pre-test data was examined as different patterns may be seen in the post-test as a result of the training for the experimental group. In the self-paced reading task, for each participant, null pronoun context sensitivity was calculated based on the difference of average RTs when referring to object antecedents versus subject antecedents, and overt pronoun context sensitivity was calculated as the difference between average RTs when referring to subject antecedents minus object antecedents. Positive RT difference values indicate qualitatively native-like sensitivity. Average accuracy from the sentence-selection task was calculated separately for each participant between the Continue and Shift conditions.

Figures 16 and 17 show scatterplots between RTs and sentence-selection accuracy in the pre-test. Pearson correlations were run in *R* between null pronoun RT difference and accuracy in the Continue sentence-selection condition, and between overt pronoun RT difference and accuracy in the Shift sentence-selection condition. This analysis revealed a moderate, positive relationship for null pronouns, such that as accuracy for the Continue condition increased, so did the null pronoun RT difference ($r = .355$, $p = .018$). There was no significant relationship

between Shift condition accuracy and overt pronoun RT difference (r = -.144, p = .351). This suggests that variability in offline comprehension of overt pronouns (in Shift contexts) is not related to variability in how these forms are processed online (at least based on performance on the self-paced reading task used in this study).

Figure 16

Scatterplot of averages of L2 pre-test data for null pronouns

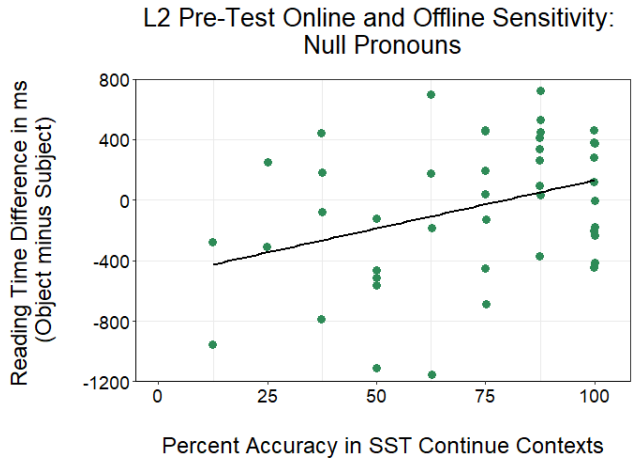
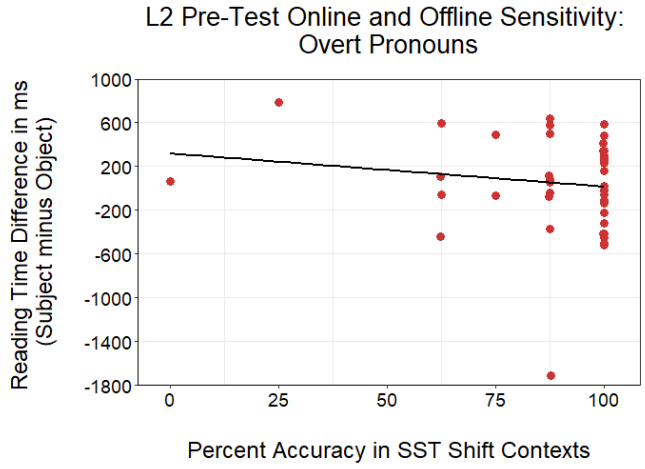


Figure 17

Scatterplot of averages of L2 pre-test data for overt pronouns

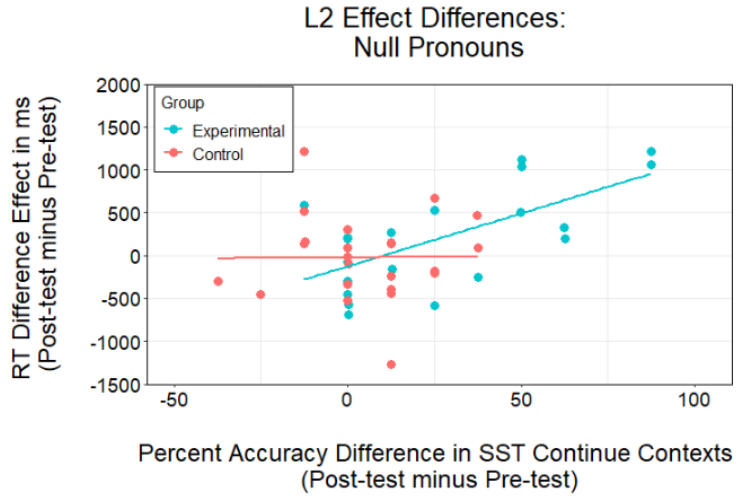


While the results for the L2 learners showed no significant interactions between group and time in the self-paced reading task, it is still possible that sensitivity changes between the pre-test and post-test. For example, if an individual participant does not show sensitivity (negative RT differences) in both the pre-test and post-test, it could still be possible to see increases in sensitivity based on whether this difference becomes more positive from the pre-test to post-test, an effect which we'd expect to see for the experimental group but not the control group. To get these RT difference effects, pronoun sensitivity (RT differences based on antecedent) was first calculated for each pronoun in the pre-test and the post-test, from which the pre-test sensitivity was subtracted from the post-test. Similarly, offline comprehension difference effects were calculated for the sentence-selection task based on average accuracy in the post-test minus the pre-test. Subsequent analyses for both RT difference effects and comprehension difference effects were then carried out separately for the training and control groups using Pearson correlations.

Correlation analyses between offline and online difference effects revealed a strong, positive relationship between null pronoun RT differences and offline Continue context comprehension differences for the experimental group (r = .658, p = .001) but not the control group (r = .011, p = .961). This can be seen in Figure 18, and suggests that those who made the largest gains in sensitivity from before and after the training did so in both the offline and online tasks. There were no significant correlations between overt pronoun RT differences and Shift context comprehension differences for the experimental group (r = -.277, p = .225) or the control group (r = .142, p = .518). This can be seen in Figure 19, and may be due in part to participants' overall high accuracy in the Shift conditions.

Figure 18

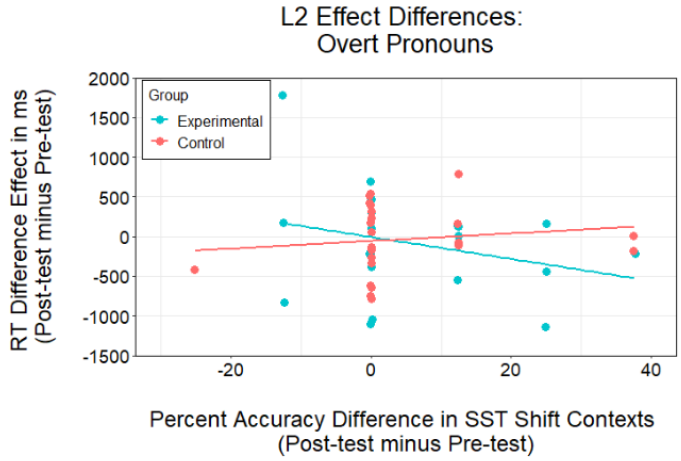
Scatterplot of L2 average effect differences for null pronouns



Note. Positive trends indicate increasing sensitivity to null pronouns.

Figure 19

Scatterplot of L2 average effect differences for overt pronouns



Note. Positive trends indicate increasing sensitivity to overt pronouns.

Summary of Results

The results of the present study suggest that L2 Spanish learners demonstrate knowledge of the discourse-pragmatic properties of null and overt subject pronouns, and that there is a benefit of explicit instruction in offline comprehension. In the sentence-selection task, the L2 learners in the experimental group showed significant improvements from pre-test to post-test, while the L2 Control group (and the native speakers) did not. Additionally, both the L2 learners and the native speakers were more accurate for Shift conditions than Continue conditions (although this difference disappeared for the L2 Experimental group in the post-test). In the self-paced reading task, neither the L2 learners nor the native speaker showed significantly different reading time patterns based on the form of the pronoun and saliency of its antecedent. These results are discussed in detail in the next chapter.

Chapter 6: Discussion and Conclusion

The present dissertation aimed to examine whether L2 Spanish learners of intermediate proficiency show sensitivity to the discourse constraints associated with null and overt subject pronouns, as well as whether the introduction of a novel training paradigm could potentially modulate sensitivity to these properties. While the L2 learners showed high accuracy and an effect of training in offline comprehension (as evidenced by the sentence-selection task), there was no robust evidence of sensitivity during online processing (as evidenced by the self-paced reading task) but some potential interpretations of effect differences between before/after training are offered. These results are discussed more in detail below as to how they pertain to each research question.

RQ1: Do L2 learners show online and offline sensitivity to the discourse-pragmatic constraints of Spanish null and overt pronouns similar to native speakers?

The L2 learners in this study showed evidence of sensitivity to Spanish null and overt subject pronouns during offline comprehension but not during online processing (in line with Feroce et al. 2019). Specifically, in the sentence-selection task, the L2 participants were quite accurate overall, while in the self-paced reading task there was no evidence of RT differences based on pronoun form-antecedent pairings (Null-Subject/Object, Overt-Subject/Object). These results can be explained in a few different ways.

In the sentence-selection task, participants were accurate in selecting whether a null or overt pronoun was more natural according to the context: null pronouns are more natural than overt pronouns in subject-continuation contexts (Continue), while overt pronouns are more natural than null pronouns in subject-shift contexts (Shift). Interestingly, both the L2 learners and native speakers were more accurate in Shift than Continue conditions, although potentially for

different reasons. While the difference between conditions was not predicted for the native speakers, it may be a more accurate reflection of the greater variability in subject pronoun usage in subject-continuation than subject-shift contexts (Carvalho, Orozco, & Shin, 2015). Similarly, Feroce et al. (2019) found that in an offline sentence-rating task, native Spanish speakers only showed a marginal preference for null pronouns over overt pronouns with subject antecedents, but a significant preference for overt pronouns over null pronouns for referring to object antecedents. For the L2 learners, there are two possible explanations of these patterns. On the one hand, it may be the case that the participants really understood the pragmatic constraints guiding pronoun usage in subject-shift contexts better than subject-continuation. Lozano (2016) discusses that not all pragmatic violations occur to the same extent, and that native speakers and L2 learners use redundant overt pronouns more-so than ambiguous null pronouns as the latter may lead to a potential breakdown in communication. Another explanation is that participants may broadly overuse pronouns in general, and hence were more accurate in Shift than Continue conditions. These two possibilities are unable to be teased apart from the design of this study.

Interestingly, the difference between Continue and Shift conditions is in line with Sorace's (2004) proposal that overt subject pronouns should be harder to acquire than null subject pronouns for L2 speakers whose L1 only has overt pronouns. Specifically, lower performance in the Continue condition emerged as greater selection of overt pronouns (the pragmatically over-informative option) while lower performance in the Shift condition was associated with greater selection of null pronouns (the pragmatically under-informative option). Thus, the results suggest that L2 learners allow overt pronouns to co-refer with salient antecedents (Continue) more often than null pronouns with non-salient antecedents (Shift), at least for the contexts examined in the sentence-selection task. This is also in line with previous

studies that have found that L1 English L2 Spanish learners at intermediate-advanced proficiency levels have difficulty with both null and overt pronouns (Clements & Domínguez, 2017; Feroce et al., 2019; Rothman, 2009). Rothman (2009) found that intermediate L2 learners overaccept null pronouns in contexts of referent shift and overt pronouns in contexts of referent continuation. Additionally, Clements and Domínguez (2017) found similar patterns for advanced L2 learners. However, it should be noted that these studies use different task types and discourse manipulations which may not all be equally comparable (see Rinke & Flores, 2018). Additionally, the speakers in this study were at the low-intermediate proficiency level (the majority of L2 participants were enrolled in 3rd and 4th semester university Spanish courses), with an average LexTale score of 12.3 (compare to 23.2 for the L2 speakers in Feroce et al. 2019), while previous studies have aimed to examine learners at relatively more advanced proficiency levels. Finally, the L2 learners on average were still accurate above chance in both the Continue (79.30%) and Shift (91.39%) conditions.

In the self-paced reading task, neither the L2 learners nor the native Spanish speakers showed evidence of sensitivity to the discourse-pragmatic properties of either null or overt pronouns. According to the Informational Load Hypothesis (ILH), referential processing is a balance between processing cost and pragmatic justification of a particular referent form. In Spanish, null pronouns tend to refer to salient antecedents while overt pronouns are more variable and tend to refer to less salient antecedents. Thus, in line with the ILH, the use of an overt subject pronoun with an object antecedent should yield faster RTs than when referring to a subject antecedent, while null pronouns should yield the opposite. Crucially, in the present study, for participants to successfully integrate null and overt pronouns into the preceding discourse, they needed to integrate a gender cue on the adjective in the second sentence with the discourse

saliency properties of its antecedent (which also involves being able to identify the antecedent in memory). In other words, to successfully resolve reference and build a coherent representation of the discourse, participants needed to use morphosyntactic information and discourse cues concurrently. Analyses of the L2 learner RT data did not show any significant interactions between antecedent and referent form, suggesting that they did not show robust sensitivity to whether a null or overt pronoun referred to a subject or object antecedent during online processing, replicating the results from Feroce et al. (2019). This may be due to limitations in processing resources as learners needed to integrate multiple sources of information in their L2 (Sorace, 2011). The fact that the learners show sensitivity in the offline task corroborates this possibility and is similar to the online/offline contrast found in Feroce et al. (2019). The native speakers also did not show any interaction of antecedent and referent form, in contrast to the data from Feroce et al. (2019) and Gelormini-Lezama and Almor (2011, 2014). However, there are a couple of differences to note between the present study and previous research. The present study has a native speaker sample size of 21 individuals, while in previous studies sample sizes range from 40 to 53 participants. Additionally, the studies by Feroce et al. and Gelormini-Lezama and Almor examine native speakers from Argentina, while the native Spanish speakers in the current study are from Spain. Despite this, it is unclear whether differences in dialects would yield differences in the comprehension and processing of subject pronouns. In speech, dialects of Spanish differ in their rates of overt pronoun expression, but they are still largely guided by the same predictors, including switch reference (e.g. Cameron, 1992). On the other hand, there is some evidence that RT patterns and reference interpretation of null and overt subject pronouns in intrasentential contexts may differ between some dialects, namely Mexican and Castilian

Spanish (Keating et al., 2016). To the best of my knowledge, no study has directly compared Spanish speakers of different dialects in pronominal processing and comprehension.

Correlation analyses for the L2 learners, based on pre-test data, were also run to more closely examine if individual differences in offline comprehension (sentence-selection task) are related to sensitivity during online processing (self-paced reading). This revealed that higher accuracy on the Continue condition in the sentence-selection task was positively correlated with increased sensitivity to null pronouns (more positive RT differences) during the self-paced reading task. This indicates that those who were more accurate at selecting the null pronoun option in the Continue contexts offline, were also more sensitive to the discourse-pragmatic properties of null pronouns during online processing. In contrast, there was no such relationship seen between accuracy on the Shift condition in the sentence-selection task and overt pronoun RT difference in the self-paced reading task. This may be in part due to individuals generally performing at ceiling in the Shift condition, although there was still considerable variability in RTs for sentences with overt pronouns in the self-paced reading task.

Finally, when considering the difference in results between the online and offline tasks, it should be kept in mind that the demands of these tasks were not exactly the same. Specifically, the self-paced reading task involved integration of a morphosyntactic gender cue to resolve reference, whereas this was not present in the sentence-selection task. Recall that in the self-paced reading task, reference was always disambiguated by a morphosyntactic gender cue on the adjective in the second sentence, which referred either to the subject or the object of the previous sentence. Additionally, successful integration of the referent involved being able to associate the correctly identified referent with particular saliency properties (syntactic subject, object) and the explicitness of the referential form (null pronoun, overt pronoun) used in the second sentence. In

contrast, in the sentence-selection task, reference was disambiguated via a visual cue (the second picture of the scene), and successful referent integration involved associating the identified referent with the saliency properties of the entity in the discourse (subject continuation, subject shift) and the explicitness of the referential form (null pronoun, overt pronoun). Thus, it is likely that the self-paced reading task was more challenging for learners than the sentence-selection task as it required integrating together morphosyntactic and discourse-pragmatic cues.

RQ2: Does explicit instruction and training help modulate learner sensitivity, online and offline, to the discourse-pragmatic constraints of Spanish null and overt pronouns?

The present study provides evidence that explicit instruction modulates learner sensitivity to the discourse-pragmatic constraints of Spanish null and overt subject pronouns during offline comprehension but not during online processing. Specifically, participants in the experimental group, but not the control group, showed higher accuracy on the sentence-selection task from pre-test to post-test, while there was no evidence of group differences in RT patterns from pre-test to post-test.

In the sentence-selection task, participants in the experimental group improved on both the Continue and Shift conditions while the control group did not. Additionally, in the post-test, the L2 Experimental group showed no differences in accuracy between conditions while the L2 Control group was still more accurate on Shift than Continue conditions (similar to the pre-test). This suggests that learner sensitivity offline to Spanish null and overt pronouns can be modulated via explicit instruction and training. The question thus arises as to what exactly in the training is responsible for helping modulate this offline sensitivity. Recall that the L2 Experimental group was taught about pronouns in Spanish in part by drawing comparisons to their L1 (English), where overuse of Spanish overt pronouns in subject-continuation contexts sounds relatively

unnatural, similar to repetition of a proper name in both Spanish and English. If indeed this is driving the training difference, this could have potential implications for how L2 discourse properties can be taught to learners via explicit comparison to their L1 (McManus & Marsden, 2017, 2019b), similar to methods of Processing Instruction for teaching L2 morphosyntactic properties (Fernández-Cuenca, 2019; VanPatten, 2002). Another possible explanation relates to the methodology used. Specifically, the training trials were the same stories from the pre-test sentence-selection task, while the items in the post-test sentence-selection task were the same stories presented in different conditions. Thus, L2 learners may have been better able to contrast the conditions in which items were presented in the post-test versus in the training, although this is merely speculative and would need to be tested with different stories between pre-test and post-test to see if L2 learners can generalize to new discourse contexts.

In contrast to the sentence-selection task, in the self-paced reading task the L2 learners did not show any significant effect of training from pre-test to post-test. That is, whether a participant received explicit training on Spanish subject pronouns or not did have a robust effect on how they processed these forms in real time, at least in the sentence contexts used in this study. One potential explanation for this is that in the training, there was no explicit practice or corrective feedback for discourse contexts that involved integration of a gender cue, a necessary component needed to resolve reference for the sentences in the self-paced reading task. However, the L2 Experimental group still saw example sentences in the training that were based on the two-sentence format from the self-paced reading task. These included explanations of how gender cues may disambiguate reference and how they relate to the use of Spanish subject pronouns. It may be the case that these examples and explanations were not sufficient to modulate sensitivity to these features during online processing. An interesting future direction

would be to provide explicit practice and feedback for integrating together cues based on morphosyntactic gender as well as discourse-antecedent saliency. It should be noted that other studies examining explicit instruction and L2 sentence processing with self-paced reading have found mixed results regarding whether L2 learners can show sensitivity to grammatical features during online processing after receiving explicit training (Dracos, 2013; Henry, 2015; Dracos & Henry, 2021; McManus & Marsden, 2019b). Additionally, the native speaker group in this study did not show online context sensitivity for either null pronouns or overt pronouns, further suggesting that capturing these effects during online processing may require more sensitive measurements (e.g. eye-tracking; Cunnings, Fotiadou, & Tsimpli, 2016).

Although the training did not seem to modulate online sensitivity to null and overt pronouns, correlation analyses between the self-paced reading task and sentence-selection task suggest some evidence of increasing sensitivity for the experimental group but not the control group. Specifically, changes in online context sensitivity to null pronouns between the pre-test and post-test were significantly correlated with changes in accuracy for the Continue conditions in the sentence-selection task. In other words, increases in sensitivity during online processing were associated with increased sensitivity in offline comprehension (at least for null pronouns), but this was only seen for the experimental group. Additionally, this result shows that individuals who made the largest gains in offline comprehension also made larger gains during online processing. This correlation was not seen, however, for overt pronouns in the self-paced reading task and accuracy for the Shift conditions in the sentence-selection task. This may have been due in part to overall high performance on the Shift conditions both in the pre-test and post-test. It would be interesting to examine whether greater variability in sensitivity to overt pronouns would emerge with a larger number of items.

One open question that remains from this study is whether or not the L2 learners actually "acquired" the discourse-pragmatic properties of null and overt subject pronouns, or if the effects seen in the post-test were just a temporary increased sensitivity to these properties. First, participants were still accurate above chance (>50%) on the sentence-selection task in the pre-test, which suggests that L2 learners at low-intermediate proficiency levels may have some understanding of the contrast between null and overt pronouns in Spanish. Since this study only incorporated an immediate post-test after the training, it cannot be said if this increased sensitivity reflected a temporary increase from the experiment or not. One way to tease apart these possibilities would be to use a delayed post-test (e.g. 4 weeks from the immediate post-test). Specifically, if the L2 Experimental group shows similar accuracy results between the immediate post-test and a delayed post-test, and accuracy on the delayed post-test is still higher than the pre-test, this may suggest that this discourse property has entered into the learner's long-term memory representation of Spanish pronouns. This would also suggest that learners can acquire properties that are said to lie at the interface between syntax and discourse-pragmatics (contra Sorace & Filiaci, 2006).

Future Directions and Pedagogical Implications

The present study has several potential future directions to explore L2 sensitivity to discourse constraints in offline comprehension and online processing. First, it would be interesting to examine if the results of the present study hold when learners have to apply what they learned in the training to new discourse scenarios. A second direction is to modify training so that participants would receive practice and feedback for discourse scenarios that require integrating together morphosyntactic gender cues and discourse-antecedent saliency cues. For example, the discourse scenarios in the sentence-selection task could be modified so that in the

training, learners would need to use knowledge about gender-marking (such as on adjectives) and discourse-antecedent saliency to choose whether a null or overt pronoun would be more appropriate in a particular context. This would be particularly useful for examining whether L2 context sensitivity to Spanish subject pronouns would emerge in the self-paced reading task. A third direction would be to examine different instruction types. Despite the fact that these properties are not usually taught in the L2 Spanish classroom, L2 learners are still able to develop sensitivity to reference continuity as a constraint of pronoun usage with increased proficiency (e.g. Geeslin et al., 2015). Thus, it may be the case that learners can show sensitivity to the discourse-pragmatics of Spanish subject pronouns under implicit training conditions. For example, discourse scenarios with subject-continuation and subject-shift contexts could be designed to draw learners' attention to the difference between null and overt subject pronouns, but without including an explanation about the null/overt alternation in these contexts (Wong & Ito, 2018). Similarly, it remains to be seen how processing and comprehension of Spanish pronouns may be impacted by task demands. In particular, it would be interesting to examine RTs for null and overt pronouns based on whether learners have to assign reference after each trial or not. Additionally, future research could incorporate individual difference measures to better examine the factors which drive variability in the processing and comprehension of these forms in L2 learners and native speakers. For example, some studies show that sensitivity to null and overt pronouns may be impacted by factors such as reading exposure (heritage Spanish speakers: Keating et al., 2016) or education level and working memory (L1 Greek: Fleva et al., 2019; c.f. L1 Spanish: Feroce, Fiorentino, Covey, & Gabriele, 2020).

The results of this dissertation have various implications for language pedagogy, particularly with regard to teaching L2 learners about properties said to lie at linguistic interfaces

(Sorace, 2011). Recently, studies have begun to identify how theoretical research in second language acquisition, psycholinguistics, and bilingualism can better inform language pedagogies (Roberts, Alonso, Pliatsikas, & Rothman, 2018), and only a few researchers have addressed this with respect to syntax-discourse interface properties (Leal & Slabakova, 2019; Rothman, 2010; Teixeira, 2016, 2021). Even so, to the best of my knowledge, the present study is one of the first studies to actually examine in an experimental context whether learners can be explicitly taught about interface properties and if this can modulate their sensitivity in both offline and online processing measures. Leal and Slabakova (2019) point out that some language instructors may be hesitant to teach students about certain interface properties, such as clitic-left dislocation (CLLD), because of perceptions that they may be too advanced for L2 learners. However, the results of the present study show that such properties can be explicitly taught to learners.

The question then arises as to why these structures should be taught to L2 learners. If the goal for language instructors is to help learners build nativelike representations and usage of the target language, it is essential that classroom materials reflect language as it is used by native speakers in naturalistic settings. While the use of such authentic materials is not without debate (e.g. Gilmore, 2007), incorporating explicit instruction in class or at least providing exercises that highlight interface properties may help learners to be better equipped in communicative situations with speakers outside the classroom. This is particularly relevant as it pertains to notions of discourse coherence and the dynamic nature of reference in natural conversation, including introduction/reintroduction and contrast of discourse participants. Certainly, classroom instruction of interface properties would have to take into account practical considerations, including which instructional methods may best suited for teaching a particular structure. For example, Leal and Slabakova (2019) advocate for teaching L2 Spanish learners about CLLD via

providing authentic written and audio materials instead of explicit instruction, suggesting that exposure alone may be enough for learning to occur (based on evidence from students who studied abroad). With respect to Spanish subject pronouns, language teachers could use authentic materials, such as conversation or interview transcripts, that highlight how native Spanish speakers construct coherent discourse by particular pronoun usage patterns: null pronouns in subject-continuation contexts (or, segments of discourse) and overt pronouns when shifting reference. Additionally, they should make clear to students that Spanish dialects differ in how often subject pronouns are used, where Caribbean Spanish speakers tend to produce more pronouns overall than speakers of non-Caribbean dialects. Thus, if a student sees that a speaker of one dialect uses more pronouns in subject-continuation contexts compared to another speaker, they should be made aware that this is not "incorrect" but rather a feature of that particular variety of Spanish. In any case, instructors should focus on the contrast in contexts where null and overt pronouns tend to be used more. As a final point, language instructors should make careful, informed decisions about how such language properties may be assessed. For example, it would not be in the best interest of teachers to penalize students for overproduction of pronouns in subject-continuation contexts. This is because learners already are dealing with potentially higher-than-normal pronoun rates even from native Spanish instructors (e.g. Dracos, 2018), as well as from their peers, and various studies show that pronoun usage rates may not reach native speaker tendencies until highly advanced proficiency levels (e.g. Geeslin & Gudmestad, 2008). In sum, language instructors should not be discouraged from explicitly teaching learners about subject pronouns. Future research should more closely examine what the sufficient and most beneficial instructional contexts and conditions are which can modulate L2 learner sensitivity to Spanish pronouns.

Conclusion

This dissertation adds to the growing body of literature examining the acquisition of discourse constraints and referential processing in L2 learners. In particular, the study makes a notable contribution as one of the first studies to experimentally investigate the role of explicit training with a syntax-discourse interface property, specifically with Spanish null and overt subject pronouns. While it is well documented that L2 Spanish learners have difficulty acquiring the discourse-pragmatic constraints of these pronouns, studies have neglected to address, in detail, how this relates to the reality that these properties are rarely taught explicitly to L2 Spanish learners, likely because it is a pragmatic property rather than a purely grammatical one. The current study utilizes a novel training paradigm by adapting instructional methods originally designed for the acquisition of morphosyntactic and semantic properties, to properties at the syntax-discourse interface. The results show that learners even at low-intermediate levels of proficiency can demonstrate sensitivity to the discourse-pragmatic constraints of null and overt subject pronouns, at least in offline comprehension measures. This is particularly compelling as it shows that learners can be explicitly taught about language properties that exhibit variability in native speaker usage, but which ultimately follow well-documented discourse-pragmatic constraints. Additionally, the study adds to the growing body of literature that examines online processing methodologies, such as self-paced reading, to examine processing of L2 Spanish pronouns. This can help researchers address theoretical proposals which suggest that learners may have difficulty integrating multiple sources of linguistic information, such as between syntax and discourse-pragmatics, possibly due to a lack of processing resources (Sorace, 2011).

The present study has implications for fostering discussion between researchers and educators across disciplines of second language acquisition, psycholinguistics, and applied

linguistics. This is particularly true with respect to properties that are shown to be variable amongst native speakers and difficult to acquire for L2 learners, but which have traditionally received less attention, if any at all, from a pedagogical standpoint. Although the study uses an experimental design and setting, classroom researchers and language educators may find it informative in thinking about how to best translate and implement these methods into the classroom. Overall, the results of the study help challenge notions of what learners and researchers think L2 learners know, what they can be taught, and raises stimulating questions for future research directions.

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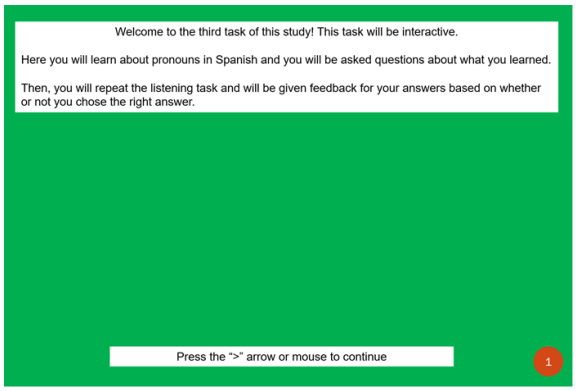
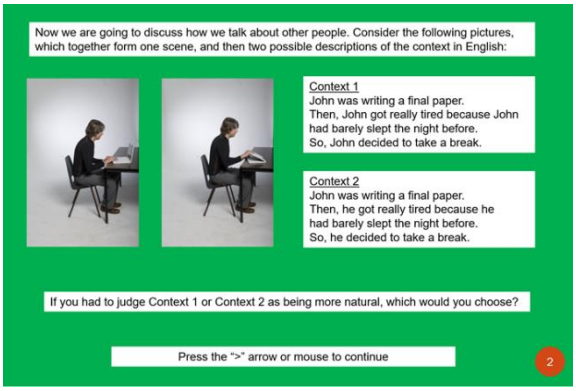
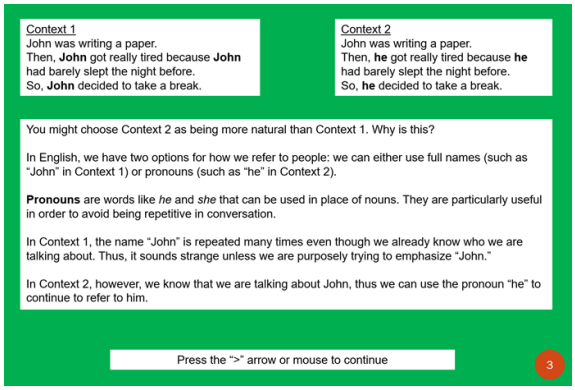
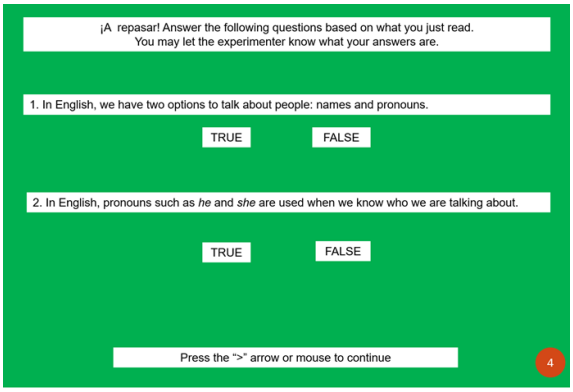
Appendix A: Training slides for the L2 Experimental group

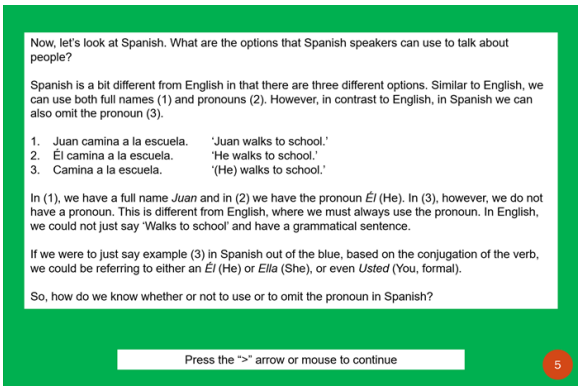
Instructional slides from the training for the L2 Experimental group. Feedback trial slides are not included here (slides 13-16, 22-25).

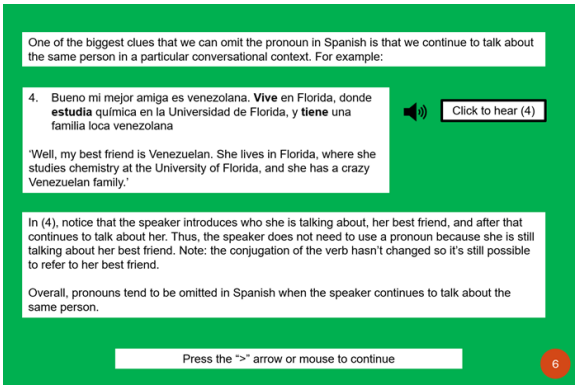












Now let's compare two contexts in Spanish.

4. Bueno, mi mejor amiga es venezolana. **Vive** en Florida, donde **estudia** química en la Universidad de Florida, y **tiene** una familia loca venezolana.
5. Bueno, mi mejor amiga es venezolana. **Ella vive** en Florida, donde **ella estudia** química en la Universidad de Florida, y **ella tiene** una familia loca venezolana.

'Well, my best friend is Venezuelan. She lives in Florida, where she studies chemistry at the University of Florida, and she has a crazy Venezuelan family.'

Click to hear (4)

Click to hear (5)

The contexts in (4) and (5) can be translated the same to English. However, (4) is the more natural option: the speaker continues to talk about the same person and thus does not need to use a pronoun.

As a native speaker of English, you are used to a subject always being used and coming before the verb. Thus, you might want to use a pronoun to be as clear as possible. This is a common strategy that both Spanish learners and some Spanish teachers use. In reality, however, although it is grammatically okay to use the pronoun *ella* (she) such as in (5), it sounds unnecessarily repetitive in Spanish.

Press the ">" arrow or mouse to continue

7

Here is another similar example in Spanish:

6. Ana vio a Martín en el partido de fútbol. **Estaba** emocionada.
7. Ana vio a Martín en el partido de fútbol. **Ella estaba** emocionada.

'Ana saw Martín at the soccer game. She was excited.'

Click to hear (6)

Click to hear (7)

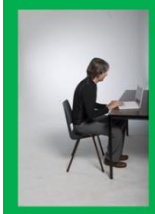
The contexts in (6) and (7) can be translated the same to English. However, (6) is the more natural option: the speaker continues to talk about the same person and thus does not need to use a pronoun.

Additionally, the adjective *emocionada* (excited) is marked feminine, thus it is clear that the speaker is referring to Ana and not Martín. That is, gender-marking information can also help to refer who you're talking about.

Press the ">" arrow or mouse to continue

8

In Spanish, if many pronouns are used to continue to refer to the same person, this results in unnecessary repetition, similar to repeating a name in English. Consider the examples below:



Context 1
Juan estaba estudiando en la biblioteca.
Juan estaba muy cansado porque Juan tenía muchos exámenes.
Por eso, Juan decidió tomar un descanso.

Context 2
Juan estaba estudiando en la biblioteca.
Él estaba muy cansado porque él tenía muchos exámenes.
Por eso, él decidió tomar un descanso.

Context 3
Juan estaba estudiando en la biblioteca.
Estaba muy cansado porque tenía muchos exámenes.
Por eso, decidió tomar un descanso.

Press the ">" arrow or mouse to continue

9

Context 1
Juan estaba estudiando en la biblioteca.
Juan estaba muy cansado porque Juan tenía muchos exámenes.
Por eso, Juan decidió tomar un descanso.

Context 2
Juan estaba estudiando en la biblioteca.
Él estaba muy cansado porque él tenía muchos exámenes.
Por eso, él decidió tomar un descanso.

In Context 1, the name *Juan* is repeated several times even though we know who we are talking about. Similar to English, repeating a name sounds less natural in Spanish.

In Context 2, the pronoun *Él* (he) is repeated several times. Unlike English, repeating a pronoun in Spanish sounds repetitive/less natural, similar to as if we had repeated a name as in Context 1.

Context 3
Juan estaba estudiando en la biblioteca.
Estaba muy cansado porque tenía muchos exámenes.
Por eso, decidió tomar un descanso.

In Context 3, after *Juan* is mentioned in the first sentence, we do not need to use the pronoun *Él* (he) because we continue to talk about the same person. Thus, Context 3 is the most natural one.

Rule of thumb: if we continue to talk about the same person, we can safely omit the pronoun.

Press the ">" arrow or mouse to continue

10

¡A repasar! Answer the following questions based on what you just read.
You may let the experimenter know what your answers are.

3. In Spanish, we always have to use a pronoun, similar to English.

TRUE FALSE

4. In Spanish, we can omit pronouns when we continue to talk about the same person.

TRUE FALSE

5. Using a pronoun in Spanish when our listener knows who is being referred to results in a repetitive sentence, similar to repeating a name.

TRUE FALSE

Press the ">" arrow or mouse to continue

11

Now let's practice what we learned about pronouns in Spanish.

You will see two pictures that form one story, and then you will also listen to two possible descriptions; text will also be provided for each version. Your job is to choose which of the two descriptions most naturally describes the pictures in the scenario based on what a native Spanish speaker would say.

This time, however, you will be given feedback for your answers.

When you click the "Continue" button, the following context will appear and the recordings will begin automatically.

Press the ">" arrow or mouse to continue

12

So far we've learned that in Spanish, we omit pronouns when we continue to talk about the same person. So when do we actually use the pronoun?

Pronouns in Spanish are often used to indicate a ***change*** in who we are talking about. For example:

8. Ella tiene un novio en México y **él** quiere visitar este verano.

'She has a boyfriend in Mexico and he wants to visit this summer.'

Click to hear (8)

In (8), the speaker is talking about *Ella* (she), but then switches to talk about *él* (he) which refers to *novio* (boyfriend).

Press the ">" arrow or mouse to continue

17

8. Ella tiene un novio en México y **él** quiere visitar este verano.

Click to hear (8)

9. Ella tiene un novio en México y quiere visitar este verano.

Click to hear (9)

The contexts in (8) and (9) could be translated the same to English, as 'She has a boyfriend in Mexico and he wants to visit this summer.' However, (8) is the more natural option: the speaker changes who is being talked about and thus uses *él* (he) to signal this change.

Although the sentence in (9) is grammatically acceptable, it is not as clear/not the best option if we want to convey that it is 'he' who wants to visit this summer. Without *él*, the speaker/listener might assume that we are still talking about *ella*.

Thus, although pronouns are often omitted in Spanish, it is usually when someone is continuing to talk about the same person, not when there has been a switch in who is being talked about. Spanish learners may also omit pronouns too often in these contexts.

Press the ">" arrow or mouse to continue

18

Now let's compare two more contexts in Spanish.

10. Ana vio a Martín en el partido de fútbol. **Él estaba** emocionado.

Click to hear (10)

11. Ana vio a Martín en el partido de fútbol. **Estaba** emocionado.

Click to hear (11)

'Ana saw Martín at the soccer game. He was excited.'

The contexts in (10) and (11) could translate the same to English. However, (10) is the more natural option: the speaker changes who is being talked about and thus uses a pronoun.

Note: even when there are clues such as gender-marked adjectives *(emocionado)*, native speakers tend to still use a pronoun in these contexts.

Press the ">" arrow or mouse to continue

19

¡A repasar! Answer the following questions based on what you just read.
You may let the experimenter know what your answers are.

6. In Spanish, we should always omit the pronoun no matter what.

TRUE FALSE

7. In Spanish, we typically use a pronoun to signal a change in who we are talking about.

TRUE FALSE

Press the ">" arrow or mouse to continue

20

Now let's practice what we learned about using pronouns in Spanish.

You will see two pictures that form one story, and then you will also listen to two possible descriptions; text will also be provided for each version. Your job is to choose which of the two descriptions most naturally describes the pictures in the scenario based on what a native Spanish speaker would say.

This time, however, you will be given feedback for your answers.

When you click the "Continue" button, the following context will appear and the recordings will begin automatically.

Press the ">" arrow or mouse to continue

21

Let's review what we've learned so far about the ways in which we can talk about other people. In English, we can use either names or pronouns. In Spanish, we can either use names, pronouns, or we can also omit the pronoun. More specifically:

1. In English, repeating a name when we continue to talk about the same person sounds repetitive. We can use a pronoun to avoid this.
2. In Spanish, in this same context, repeating a pronoun when we continue to talk about the same person sounds repetitive, similar to repeating a name.
3. In Spanish, we tend to omit the pronoun when we continue to talk about the same person. In these contexts, native speakers rely on the form of the verb or the adjective to provide information about who is being referred to.
4. In Spanish, pronouns tend to be used when signaling a change in who we are talking about. If pronouns are omitted too often in this kind of context, this results in less natural sentences that may be unclear as to who we are talking about.

Press the ">" arrow or mouse to continue

26

Appendix B: Regression Tables

Table 5

Logistic mixed model results for L2 speakers, without proficiency, for Sentence-Selection Task (reference level is Control group, Pre-test, Continue contexts)

Fixed Effects				
	β	*SE*	*z*	*p*
Intercept	1.555	0.345	4.505	< .001
Group (exp)	-0.633	0.482	-1.313	.189
Time (post-test)	0.380	0.286	1.330	.183
Condition (shift)	1.172	0.320	3.667	< .001
Group x Time (exp, post)	1.906	0.469	4.066	< .001
Group x Condition (exp, shift)	0.500	0.453	1.105	.269
Time x Condition (post, shift)	0.230	0.482	0.476	.634
Group x Time x Condition (exp, post, shift)	-1.556	0.748	-2.081	.037
Random Effects				
	Variance		S.D.	
Participant (Intercept)	1.713		1.309	

Model fit (LL): -479.4

Table 6

Logistic mixed model results for L2 speakers, with proficiency, for Sentence-Selection Task (reference level is Control group, Pre-test, Continue contexts)

Fixed Effects				
	β	*SE*	*z*	*p*
Intercept	1.603	0.323	4.964	< .001
Group (exp)	-0.683	0.446	-1.532	.126
Time (post-test)	0.381	0.287	1.328	.184
Condition (shift)	1.173	0.321	3.658	< .001
Proficiency	0.692	0.206	3.363	.001
Group x Time (exp, post)	1.915	0.470	4.075	< .001
Group x Condition (exp, shift)	0.496	0.454	1.092	.275
Time x Condition (post, shift)	0.228	0.484	0.470	.638
Group x Time x Condition (exp, post, shift)	-1.552	0.749	-2.073	.038
Random Effects				
	Variance		S.D.	
Participant (Intercept)	1.321		1.149	

Model fit (LL): -474.1

Table 7

Linear mixed model results for L2 learner reading times, without proficiency (reference level is Control group, Pre-test, Subject antecedents, Null pronouns)

Fixed Effects				
	β	*SE*	*t*	*p*
Intercept	1780.348	98.306	18.110	< .001
Group (exp)	-75.245	132.961	-0.566	.574
Time (post-test)	-499.966	52.335	-9.553	< .001
Antecedent (object)	-102.116	52.386	-1.949	.051
Form (overt)	262.310	52.433	5.003	< .001
Group x Time (exp, post)	-6.780	72.796	-0.093	.926
Group x Antecedent (exp, object)	119.432	72.646	1.644	.100
Time x Antecedent (post, object)	157.106	73.967	2.124	.034
Group x Form (exp, overt)	22.731	72.444	0.314	.754
Time x Form (post, overt)	-84.792	73.659	-1.151	.250
Antecedent x Form (object, overt)	49.978	74.016	0.675	.500
Group x Time x Antecedent (exp, post, object)	-176.428	102.858	-1.715	.086
Group x Time x Form (exp, post, overt)	25.067	102.491	0.245	.807
Group x Antecedent x Form (exp, object, overt)	-119.552	102.495	-1.166	.244
Time x Antecedent x Form (post, object, overt)	-40.816	104.352	-0.391	.696
Group x Time x Antecedent x Form (exp, post, object, overt)	97.220	145.095	0.670	.503

Random Effects		
	Variance	S.D.
Participant (Intercept)	168892	411.0
Item (Intercept)	21221	145.7

Model fit (LL): -46800.5

Table 8

Linear mixed model results for L2 learner reading times, with proficiency (reference level is Control group, Pre-test, Subject antecedents, Null pronouns)

Fixed Effects				
	β	*SE*	*t*	*p*
Intercept	1778.213	95.181	18.682	< .001
Group (exp)	-75.343	128.509	-0.586	.560
Time (post)	-500.867	52.154	-9.604	< .001
Antecedent (object)	-104.113	52.204	-1.994	.046
Form (overt)	261.899	52.251	5.012	< .001
Proficiency	-167.375	92.270	-1.814	.075
Group x Time (exp, post)	-6.186	72.529	-0.085	.932
Group x Antecedent (exp, object)	122.231	72.383	1.689	.091
Time x Antecedent (post, object)	160.648	73.701	2.180	.029
Group x Form (exp, overt)	21.129	72.180	0.293	.770
Time x Form (post, overt)	-84.304	73.396	-1.149	.251
Antecedent x Form (object, overt)	53.675	73.753	0.728	.467
Group x Proficiency (exp)	-0.392	128.585	-0.003	.998
Time x Proficiency (post)	10.525	52.394	0.201	.841
Antecedent x Proficiency (object)	69.075	52.099	1.326	.185
Form x Proficiency (overt)	16.950	52.599	0.322	.747
Group x Time x Antecedent (exp, post, object)	-178.367	102.480	-1.741	.082
Group x Time x Form (exp, post, overt)	27.744	102.108	0.272	.786
Group x Antecedent x Form (exp, object, overt)	-120.373	102.125	-1.179	.239
Time x Antecedent x Form (post, object, overt)	-46.914	103.969	-0.451	.652
Group x Time x Proficiency (exp, post)	153.170	73.548	2.083	.037
Group x Antecedent x Proficiency (exp, object)	20.958	72.014	0.291	.771
Time x Antecedent x Proficiency (post, object)	20.514	73.864	0.278	.781
Group x Form x Proficiency (exp, overt)	-43.766	73.073	-0.599	.549
Time x Form x Proficiency (post, overt)	28.269	74.328	0.38	.704
Antecedent x Form x Proficiency (object, overt)	-144.723	73.811	-1.961	.050
Group x Time x Antecedent x Form (exp, post, object, overt)	97.856	144.563	0.677	.499
Group x Time x Antecedent x Proficiency (exp, post, object)	-80.875	102.737	-0.787	.431
Group x Time x Form x Proficiency (exp, post, overt)	-70.599	105.403	-0.67	.503
Group x Antecedent x Form x Proficiency (exp, object, overt)	149.418	102.144	1.463	.144
Time x Antecedent x Form x Proficiency (post, object, overt)	-20.836	104.273	-0.2	.842
Group x Time x Antecedent x Form x Proficiency (exp, post, object, overt)	25.781	145.313	0.177	.859

Random Effects		
	Variance	S.D.
Participant (Intercept)	155963	394.9
Item (Intercept)	20842	144.4

Model fit (LL): -46775.8

Table 9

Logistic mixed model results for native speakers in Sentence-Selection Task (reference level is Continue contexts)

Fixed Effects				
	β	*SE*	*z*	*p*
Intercept	2.689	0.457	5.883	< .001
Condition (shift)	2.412	0.466	5.174	< .001
Random Effects				
	Variance		S.D.	
Participant (Intercept)	2.507		1.583	

Model fit (LL): -133.3

Table 10

Linear mixed model results for native speaker reading times, (reference level is Subject antecedents, Null pronouns)

Fixed Effects				
	β	*SE*	*t*	*p*
Intercept	1193.71	71.05	16.800	< .001
Antecedent (object)	27.99	41.14	0.680	.496
Form (overt)	129.12	41.26	3.129	.002
Antecedent x Form (object, overt)	-48.13	58.27	-0.826	.409
Random Effects				
	Variance		S.D.	
Participant (Intercept)	87649		296.06	
Item (Intercept)	1054		32.46	

Model fit (LL): -10989.3

Appendix C: Target stimuli for self-paced reading task

Target stimuli for self-paced reading task and their English translations. Items are shown in the subject antecedent/overt pronoun condition, but each item occurred in all four experimental conditions (see Methods section, chapter 3).

Set	Antecedent	Pronoun	Sentence 1	Sentence 2
1	Subject	Null	Alejandro dejó a Marta en casa.	Estaba frustrado.
1	Subject	Overt	Alejandro dejó a Marta en casa.	Él estaba frustrado.
1	Object	Null	Marta dejó a Alejandro en casa.	Estaba frustrado.
1	Object	Overt	Marta dejó a Alejandro en casa.	Él estaba frustrado.
2	Subject	Null	Carlos habló con Elena ayer.	Estaba tranquilo.
2	Subject	Overt	Carlos habló con Elena ayer.	Él estaba tranquilo.
2	Object	Null	Elena habló con Carlos ayer.	Estaba tranquilo.
2	Object	Overt	Elena habló con Carlos ayer.	Él estaba tranquilo.
3	Subject	Null	Diego mató a Sara en el videojuego.	Estaba asombrado.
3	Subject	Overt	Diego mató a Sara en el videojuego.	Él estaba asombrado.
3	Object	Null	Sara mató a Diego en el videojuego.	Estaba asombrado.
3	Object	Overt	Sara mató a Diego en el videojuego.	Él estaba asombrado.
4	Subject	Null	Eduardo sirvió a Isabel en el bar.	Estaba molesto.
4	Subject	Overt	Eduardo sirvió a Isabel en el bar.	Él estaba molesto.
4	Object	Null	Isabel sirvió a Eduardo en el bar.	Estaba molesto.
4	Object	Overt	Isabel sirvió a Eduardo en el bar.	Él estaba molesto.
5	Subject	Null	Fernando agradeció a Natalia después de la entrevista.	Estaba contento.
5	Subject	Overt	Fernando agradeció a Natalia después de la entrevista.	Él estaba contento.
5	Object	Null	Natalia agradeció a Fernando después de la entrevista.	Estaba contento.
5	Object	Overt	Natalia agradeció a Fernando después de la entrevista.	Él estaba contento.
6	Subject	Null	Ignacio evitó a Rebeca en la conferencia.	Estaba enfermo.
6	Subject	Overt	Ignacio evitó a Rebeca en la conferencia.	Él estaba enfermo.
6	Object	Null	Rebeca evitó a Ignacio en la conferencia.	Estaba enfermo.
6	Object	Overt	Rebeca evitó a Ignacio en la conferencia.	Él estaba enfermo.
7	Subject	Null	Jorge siguió a Patricia por el centro comercial.	Estaba perdido.
7	Subject	Overt	Jorge siguió a Patricia por el centro comercial.	Él estaba perdido.
7	Object	Null	Patricia siguió a Jorge por el centro comercial.	Estaba perdido.

Set	Antecedent	Pronoun	Sentence 1	Sentence 2
7	Object	Overt	Patricia siguió a Jorge por el centro comercial.	Él estaba perdido.
8	Subject	Null	Jose sorprendió a Valeria con la noticia.	Estaba entusiasmado.
8	Subject	Overt	Jose sorprendió a Valeria con la noticia.	Él estaba entusiasmado.
8	Object	Null	Valeria sorprendió a Jose con la noticia.	Estaba entusiasmado.
8	Object	Overt	Valeria sorprendió a Jose con la noticia.	Él estaba entusiasmado.
9	Subject	Null	Juan visitó a Cristina el verano pasado.	Estaba desempleado.
9	Subject	Overt	Juan visitó a Cristina el verano pasado.	Él estaba desempleado.
9	Object	Null	Cristina visitó a Juan el verano pasado.	Estaba desempleado.
9	Object	Overt	Cristina visitó a Juan el verano pasado.	Él estaba desempleado.
10	Subject	Null	Lucas besó a Sofía por primera vez.	Estaba nervioso.
10	Subject	Overt	Lucas besó a Sofía por primera vez.	Él estaba nervioso.
10	Object	Null	Sofía besó a Lucas por primera vez.	Estaba nervioso.
10	Object	Overt	Sofía besó a Lucas por primera vez.	Él estaba nervioso.
11	Subject	Null	Manuel estudió con Ana en la biblioteca.	Estaba motivado.
11	Subject	Overt	Manuel estudió con Ana en la biblioteca.	Él estaba motivado.
11	Object	Null	Ana estudió con Manuel en la biblioteca.	Estaba motivado.
11	Object	Overt	Ana estudió con Manuel en la biblioteca.	Él estaba motivado.
12	Subject	Null	Martín caminó con Catalina en la playa.	Estaba descalzo.
12	Subject	Overt	Martín caminó con Catalina en la playa.	Él estaba descalzo.
12	Object	Null	Catalina caminó con Martín en la playa.	Estaba descalzo.
12	Object	Overt	Catalina caminó con Martín en la playa.	Él estaba descalzo.
13	Subject	Null	Mateo corrió con Paula bajo la lluvia.	Estaba empapado.
13	Subject	Overt	Mateo corrió con Paula bajo la lluvia.	Él estaba empapado.
13	Object	Null	Paula corrió con Mateo bajo la lluvia.	Estaba empapado.
13	Object	Overt	Paula corrió con Mateo bajo la lluvia.	Él estaba empapado.
14	Subject	Null	Miguel abrazó a Silvia en el hospital.	Estaba preocupado.
14	Subject	Overt	Miguel abrazó a Silvia en el hospital.	Él estaba preocupado.
14	Object	Null	Silvia abrazó a Miguel en el hospital.	Estaba preocupado.
14	Object	Overt	Silvia abrazó a Miguel en el hospital.	Él estaba preocupado.
15	Subject	Null	Pedro aplaudió a Raquel en la ceremonia.	Estaba impresionado.
15	Subject	Overt	Pedro aplaudió a Raquel en la ceremonia.	Él estaba impresionado.
15	Object	Null	Raquel aplaudió a Pedro en la ceremonia.	Estaba impresionado.
15	Object	Overt	Raquel aplaudió a Pedro en la ceremonia.	Él estaba impresionado.
16	Subject	Null	Roberto dibujó a Mónica en casa.	Estaba calmado.
16	Subject	Overt	Roberto dibujó a Mónica en casa.	Él estaba calmado.
16	Object	Null	Mónica dibujó a Roberto en casa.	Estaba calmado.
16	Object	Overt	Mónica dibujó a Roberto en casa.	Él estaba calmado.
17	Subject	Null	Rodrigo viajó con Leticia por 10 horas en coche.	Estaba mareado.
17	Subject	Overt	Rodrigo viajó con Leticia por 10 horas en coche.	Él estaba mareado.

Set	Antecedent	Pronoun	Sentence 1	Sentence 2
17	Object	Null	Leticia viajó con Rodrigo por 10 horas en coche.	Estaba mareado.
17	Object	Overt	Leticia viajó con Rodrigo por 10 horas en coche.	Él estaba mareado.
18	Subject	Null	Santiago escribió a María después del divorcio.	Estaba deprimido.
18	Subject	Overt	Santiago escribió a María después del divorcio.	Él estaba deprimido.
18	Object	Null	María escribió a Santiago después del divorcio.	Estaba deprimido.
18	Object	Overt	María escribió a Santiago después del divorcio.	Él estaba deprimido.
19	Subject	Null	Ana dejó a Miguel por la última vez.	Estaba furiosa.
19	Subject	Overt	Ana dejó a Miguel por la última vez.	Ella estaba furiosa.
19	Object	Null	Miguel dejó a Ana por la última vez.	Estaba furiosa.
19	Object	Overt	Miguel dejó a Ana por la última vez.	Ella estaba furiosa.
20	Subject	Null	Catalina habló con Manuel por teléfono.	Estaba cansada.
20	Subject	Overt	Catalina habló con Manuel por teléfono.	Ella estaba cansada.
20	Object	Null	Manuel habló con Catalina por teléfono.	Estaba cansada.
20	Object	Overt	Manuel habló con Catalina por teléfono.	Ella estaba cansada.
21	Subject	Null	Cristina mató a Roberto en póker en el bar.	Estaba sorprendida.
21	Subject	Overt	Cristina mató a Roberto en póker en el bar.	Ella estaba sorprendida.
21	Object	Null	Roberto mató a Cristina en póker en el bar.	Estaba sorprendida.
21	Object	Overt	Roberto mató a Cristina en póker en el bar.	Ella estaba sorprendida.
22	Subject	Null	Elena sirvió a Diego en el café.	Estaba fastidiada.
22	Subject	Overt	Elena sirvió a Diego en el café.	Ella estaba fastidiada.
22	Object	Null	Diego sirvió a Elena en el café.	Estaba fastidiada.
22	Object	Overt	Diego sirvió a Elena en el café.	Ella estaba fastidiada.
23	Subject	Null	Isabel agradeció a Jose todos los consejos.	Estaba satisfecha.
23	Subject	Overt	Isabel agradeció a Jose todos los consejos.	Ella estaba satisfecha.
23	Object	Null	Jose agradeció a Isabel todos los consejos.	Estaba satisfecha.
23	Object	Overt	Jose agradeció a Isabel todos los consejos.	Ella estaba satisfecha.
24	Subject	Null	Leticia evitó a Pedro toda la noche.	Estaba ocupada.
24	Subject	Overt	Leticia evitó a Pedro toda la noche.	Ella estaba ocupada.
24	Object	Null	Pedro evitó a Leticia toda la noche.	Estaba ocupada.
24	Object	Overt	Pedro evitó a Leticia toda la noche.	Ella estaba ocupada.
25	Subject	Null	María siguió a Lucas en el museo.	Estaba fascinada.
25	Subject	Overt	María siguió a Lucas en el museo.	Ella estaba fascinada.
25	Object	Null	Lucas siguió a María en el museo.	Estaba fascinada.
25	Object	Overt	Lucas siguió a María en el museo.	Ella estaba fascinada.
26	Subject	Null	Marta sorprendió a Ignacio con el anuncio.	Estaba emocionada.
26	Subject	Overt	Marta sorprendió a Ignacio con el anuncio.	Ella estaba emocionada.
26	Object	Null	Ignacio sorprendió a Marta con el anuncio.	Estaba emocionada.

Set	Antecedent	Pronoun	Sentence 1	Sentence 2
26	Object	Overt	Ignacio sorprendió a Marta con el anuncio.	Ella estaba emocionada.
27	Subject	Null	Mónica visitó a Alejandro en casa.	Estaba aburrida.
27	Subject	Overt	Mónica visitó a Alejandro en casa.	Ella estaba aburrida.
27	Object	Null	Alejandro visitó a Mónica en casa.	Estaba aburrida.
27	Object	Overt	Alejandro visitó a Mónica en casa.	Ella estaba aburrida.
28	Subject	Null	Natalia besó a Jorge en la fiesta.	Estaba sonrojada.
28	Subject	Overt	Natalia besó a Jorge en la fiesta.	Ella estaba sonrojada.
28	Object	Null	Jorge besó a Natalia en la fiesta.	Estaba sonrojada.
28	Object	Overt	Jorge besó a Natalia en la fiesta.	Ella estaba sonrojada.
29	Subject	Null	Patricia estudió con Rodrigo para el examen.	Estaba concentrada.
29	Subject	Overt	Patricia estudió con Rodrigo para el examen.	Ella estaba concentrada.
29	Object	Null	Rodrigo estudió con Patricia para el examen.	Estaba concentrada.
29	Object	Overt	Rodrigo estudió con Patricia para el examen.	Ella estaba concentrada.
30	Subject	Null	Paula caminó con Eduardo por el parque.	Estaba relajada.
30	Subject	Overt	Paula caminó con Eduardo por el parque.	Ella estaba relajada.
30	Object	Null	Eduardo caminó con Paula por el parque.	Estaba relajada.
30	Object	Overt	Eduardo caminó con Paula por el parque.	Ella estaba relajada.
31	Subject	Null	Raquel corrió con Santiago en el maratón.	Estaba orgullosa.
31	Subject	Overt	Raquel corrió con Santiago en el maratón.	Ella estaba orgullosa.
31	Object	Null	Santiago corrió con Raquel en el maratón.	Estaba orgullosa.
31	Object	Overt	Santiago corrió con Raquel en el maratón.	Ella estaba orgullosa.
32	Subject	Null	Rebeca abrazó a Carlos esta mañana.	Estaba estresada.
32	Subject	Overt	Rebeca abrazó a Carlos esta mañana.	Ella estaba estresada.
32	Object	Null	Carlos abrazó a Rebeca esta mañana.	Estaba estresada.
32	Object	Overt	Carlos abrazó a Rebeca esta mañana.	Ella estaba estresada.
33	Subject	Null	Sara aplaudió a Juan en el teatro.	Estaba ilusionada.
33	Subject	Overt	Sara aplaudió a Juan en el teatro.	Ella estaba ilusionada.
33	Object	Null	Juan aplaudió a Sara en el teatro.	Estaba ilusionada.
33	Object	Overt	Juan aplaudió a Sara en el teatro.	Ella estaba ilusionada.
34	Subject	Null	Silvia dibujó a Fernando durante el examen de matemáticas.	Estaba distraída.
34	Subject	Overt	Silvia dibujó a Fernando durante el examen de matemáticas.	Ella estaba distraída.
34	Object	Null	Fernando dibujó a Silvia durante el examen de matemáticas.	Estaba distraída.
34	Object	Overt	Fernando dibujó a Silvia durante el examen de matemáticas.	Ella estaba distraída.
35	Subject	Null	Sofía viajó con Martín a Disney World.	Estaba eufórica.
35	Subject	Overt	Sofía viajó con Martín a Disney World.	Ella estaba eufórica.

Set	Antecedent	Pronoun	Sentence 1	Sentence 2
35	Object	Null	Martín viajó con Sofía a Disney World.	Estaba eufórica.
35	Object	Overt	Martín viajó con Sofía a Disney World.	Ella estaba eufórica.
36	Subject	Null	Valeria escribió a Mateo después del accidente.	Estaba angustiada.
36	Subject	Overt	Valeria escribió a Mateo después del accidente.	Ella estaba angustiada.
36	Object	Null	Mateo escribió a Valeria después del accidente.	Estaba angustiada.
36	Object	Overt	Mateo escribió a Valeria después del accidente.	Ella estaba angustiada.

English Translations

Set	Antecedent	Pronoun	Sentence 1	Sentence 2
1	Subject	Null	Alejandro left Marta at home.	*pro* was frustrated.
1	Subject	Overt	Alejandro left Marta at home.	He was frustrated.
1	Object	Null	Marta left Alejandro at home.	*pro* was frustrated.
1	Object	Overt	Marta left Alejandro at home.	He was frustrated.
2	Subject	Null	Carlos talked with Elena yesterday.	*pro* was calm.
2	Subject	Overt	Carlos talked with Elena yesterday.	He was calm.
2	Object	Null	Elena talked with Carlos yesterday.	*pro* was calm.
2	Object	Overt	Elena talked with Carlos yesterday.	He was calm.
3	Subject	Null	Diego killed Sara in the videogame.	*pro* was astonished.
3	Subject	Overt	Diego killed Sara in the videogame.	He was astonished.
3	Object	Null	Sara killed Diego in the videogame.	*pro* was astonished.
3	Object	Overt	Sara killed Diego in the videogame.	He was astonished.
4	Subject	Null	Eduardo served Isabel at the bar.	*pro* was annoyed.
4	Subject	Overt	Eduardo served Isabel at the bar.	He was annoyed.
4	Object	Null	Isabel served Eduardo at the bar.	*pro* was annoyed.
4	Object	Overt	Isabel served Eduardo at the bar.	He was annoyed.
5	Subject	Null	Fernando thanked Natalia after the interview.	*pro* was happy.
5	Subject	Overt	Fernando thanked Natalia after the interview.	He was happy.
5	Object	Null	Natalia thanked Fernando after the interview.	*pro* was happy.
5	Object	Overt	Natalia thanked Fernando after the interview.	He was happy.
6	Subject	Null	Ignacio avoided Rebeca at the conference.	*pro* was sick.
6	Subject	Overt	Ignacio avoided Rebeca at the conference.	He was sick.
6	Object	Null	Rebeca avoided Ignacio at the conference.	*pro* was sick.
6	Object	Overt	Rebeca avoided Ignacio at the conference.	He was sick.
7	Subject	Null	Jorge followed Patricia through the mall.	*pro* was lost.
7	Subject	Overt	Jorge followed Patricia through the mall.	He was lost.
7	Object	Null	Patricia followed Jorge through the mall.	*pro* was lost.
7	Object	Overt	Patricia followed Jorge through the mall.	He was lost.
8	Subject	Null	Jose surprised Valeria with the news.	*pro* was excited.
8	Subject	Overt	Jose surprised Valeria with the news.	He was excited.
8	Object	Null	Valeria surprised Jose with the news.	*pro* was excited.
8	Object	Overt	Valeria surprised Jose with the news.	He was excited.
9	Subject	Null	Juan visited Cristina last summer.	*pro* was unemployed.
9	Subject	Overt	Juan visited Cristina last summer.	He was unemployed.
9	Object	Null	Cristina visited Juan last summer.	*pro* was unemployed.
9	Object	Overt	Cristina visited Juan last summer.	He was unemployed.
10	Subject	Null	Lucas kissed Sofía for the first time.	*pro* was nervous.
10	Subject	Overt	Lucas kissed Sofía for the first time.	He was nervous.
10	Object	Null	Sofía kissed Lucas for the first time.	*pro* was nervous.
10	Object	Overt	Sofía kissed Lucas for the first time.	He was nervous.

Set	Antecedent	Pronoun	Sentence 1	Sentence 2
11	Subject	Null	Manuel studied with Ana in the library.	*pro* was motivated.
11	Subject	Overt	Manuel studied with Ana in the library.	He was motivated.
11	Object	Null	Ana studied with Manuel in the library.	*pro* was motivated.
11	Object	Overt	Ana studied with Manuel in the library.	He was motivated.
12	Subject	Null	Martín walked with Catalina on the beach.	*pro* was barefoot.
12	Subject	Overt	Martín walked with Catalina on the beach.	He was barefoot.
12	Object	Null	Catalina walked with Martín on the beach.	*pro* was barefoot.
12	Object	Overt	Catalina walked with Martín on the beach.	He was barefoot.
13	Subject	Null	Mateo ran with Paula beneath the rain.	*pro* was soaked.
13	Subject	Overt	Mateo ran with Paula beneath the rain.	He was soaked.
13	Object	Null	Paula ran with Mateo beneath the rain.	*pro* was soaked.
13	Object	Overt	Paula ran with Mateo beneath the rain.	He was soaked.
14	Subject	Null	Miguel hugged Silvia in the hospital.	*pro* was worried.
14	Subject	Overt	Miguel hugged Silvia in the hospital.	He was worried.
14	Object	Null	Silvia hugged Miguel in the hospital.	*pro* was worried.
14	Object	Overt	Silvia hugged Miguel in the hospital.	He was worried.
15	Subject	Null	Pedro applauded Raquel at the ceremony.	*pro* was impressed.
15	Subject	Overt	Pedro applauded Raquel at the ceremony.	He was impressed.
15	Object	Null	Raquel applauded Pedro at the ceremony.	*pro* was impressed.
15	Object	Overt	Raquel applauded Pedro at the ceremony.	He was impressed.
16	Subject	Null	Roberto drew Mónica at home.	*pro* was calm.
16	Subject	Overt	Roberto drew Mónica at home.	He was calm.
16	Object	Null	Mónica drew Roberto at home.	*pro* was calm.
16	Object	Overt	Mónica drew Roberto at home.	He was calm.
17	Subject	Null	Rodrigo traveled with Leticia for 10 hours by car.	*pro* was carsick.
17	Subject	Overt	Rodrigo traveled with Leticia for 10 hours by car.	He was carsick.
17	Object	Null	Leticia traveled with Rodrigo for 10 hours by car.	*pro* was carsick.
17	Object	Overt	Leticia traveled with Rodrigo for 10 hours by car.	He was carsick.
18	Subject	Null	Santiago wrote to María after the divorce.	*pro* was depressed.
18	Subject	Overt	Santiago wrote to María after the divorce.	He was depressed.
18	Object	Null	María wrote to Santiago after the divorce.	*pro* was depressed.
18	Object	Overt	María wrote to Santiago after the divorce.	He was depressed.
19	Subject	Null	Ana left Miguel for the last time.	*pro* was furious.
19	Subject	Overt	Ana left Miguel for the last time.	She was furious.
19	Object	Null	Miguel left Ana for the last time.	*pro* was furious.
19	Object	Overt	Miguel left Ana for the last time.	She was furious.
20	Subject	Null	Catalina talked with Manuel over the phone.	*pro* was tired.
20	Subject	Overt	Catalina talked with Manuel over the phone.	She was tired.
20	Object	Null	Manuel talked with Catalina over the phone.	*pro* was tired.

Set	Antecedent	Pronoun	Sentence 1	Sentence 2
20	Object	Overt	Manuel talked with Catalina over the phone.	She was tired.
21	Subject	Null	Cristina killed Roberto in poker at the bar.	*pro* was surprised.
21	Subject	Overt	Cristina killed Roberto in poker at the bar.	She was surprised.
21	Object	Null	Roberto killed Cristina in poker at the bar.	*pro* was surprised.
21	Object	Overt	Roberto killed Cristina in poker at the bar.	She was surprised.
22	Subject	Null	Elena served Diego at the café.	*pro* was annoyed.
22	Subject	Overt	Elena served Diego at the café.	She was annoyed.
22	Object	Null	Diego served Elena at the café.	*pro* was annoyed.
22	Object	Overt	Diego served Elena at the café.	She was annoyed.
23	Subject	Null	Isabel thanked Jose for all the advice.	*pro* was satisfied.
23	Subject	Overt	Isabel thanked Jose for all the advice.	She was satisfied.
23	Object	Null	Jose thanked Isabel for all the advice.	*pro* was satisfied.
23	Object	Overt	Jose thanked Isabel for all the advice.	She was satisfied.
24	Subject	Null	Leticia avoided Pedro the whole night.	*pro* was busy.
24	Subject	Overt	Leticia avoided Pedro the whole night.	She was busy.
24	Object	Null	Pedro avoided Leticia the whole night.	*pro* was busy.
24	Object	Overt	Pedro avoided Leticia the whole night.	She was busy.
25	Subject	Null	María followed Lucas in the museum.	*pro* was fascinated.
25	Subject	Overt	María followed Lucas in the museum.	She was fascinated.
25	Object	Null	Lucas followed María in the museum.	*pro* was fascinated.
25	Object	Overt	Lucas followed María in the museum.	She was fascinated.
26	Subject	Null	Marta surprised Ignacio with the announcement.	*pro* was excited.
26	Subject	Overt	Marta surprised Ignacio with the announcement.	She was excited.
26	Object	Null	Ignacio surprised Marta with the announcement.	*pro* was excited.
26	Object	Overt	Ignacio surprised Marta with the announcement.	She was excited.
27	Subject	Null	Mónica visited Alejandro at home.	*pro* was bored.
27	Subject	Overt	Mónica visited Alejandro at home.	She was bored.
27	Object	Null	Alejandro visited Mónica at home.	*pro* was bored.
27	Object	Overt	Alejandro visited Mónica at home.	She was bored.
28	Subject	Null	Natalia kissed Jorge at the party.	*pro* was blushing.
28	Subject	Overt	Natalia kissed Jorge at the party.	She was blushing.
28	Object	Null	Jorge kissed Natalia at the party.	*pro* was blushing.
28	Object	Overt	Jorge kissed Natalia at the party.	She was blushing.
29	Subject	Null	Patricia studied with Rodrigo for the test.	*pro* was focused.
29	Subject	Overt	Patricia studied with Rodrigo for the test.	She was focused.
29	Object	Null	Patricia studied with Rodrigo for the test.	*pro* was focused.
29	Object	Overt	Rodrigo studied with Patricia for the test.	She was focused.
30	Subject	Null	Paula walked with Eduardo through the park.	*pro* was relaxed.
30	Subject	Overt	Paula walked with Eduardo through the park.	She was relaxed.

Set	Antecedent	Pronoun	Sentence 1	Sentence 2
30	Object	Null	Eduardo walked with Patricia through the park.	*pro* was relaxed.
30	Object	Overt	Eduardo walked with Patricia through the park.	She was relaxed.
31	Subject	Null	Raquel ran with Santiago in the marathon.	*pro* was proud.
31	Subject	Overt	Raquel ran with Santiago in the marathon.	She was proud.
31	Object	Null	Santiago ran with Raquel in the marathon.	*pro* was proud.
31	Object	Overt	Santiago ran with Raquel in the marathon.	She was proud.
32	Subject	Null	Rebeca hugged Carlos this morning.	*pro* was stressed.
32	Subject	Overt	Rebeca hugged Carlos this morning.	She was stressed.
32	Object	Null	Carlos hugged Rebeca this morning.	*pro* was stressed.
32	Object	Overt	Carlos hugged Rebeca this morning.	She was stressed.
33	Subject	Null	Sara applauded Juan at the theater.	*pro* was excited.
33	Subject	Overt	Sara applauded Juan at the theater.	She was excited.
33	Object	Null	Juan applauded Sara at the theater.	*pro* was excited.
33	Object	Overt	Juan applauded Sara at the theater.	She was excited.
34	Subject	Null	Silvia drew Fernando during the math test.	*pro* was distracted.
34	Subject	Overt	Silvia drew Fernando during the math test.	She was distracted.
34	Object	Null	Fernando drew Silvia during the math test.	*pro* was distracted.
34	Object	Overt	Fernando drew Silvia during the math test.	She was distracted.
35	Subject	Null	Sofía traveled with Martín to Disney World.	*pro* was ecstatic.
35	Subject	Overt	Sofía traveled with Martín to Disney World.	She was ecstatic.
35	Object	Null	Martín traveled with Sofía to Disney World.	*pro* was ecstatic.
35	Object	Overt	Martín traveled with Sofía to Disney World.	She was ecstatic.
36	Subject	Null	Valeria wrote to Mateo after the accident.	*pro* was distressed.
36	Subject	Overt	Valeria wrote to Mateo after the accident.	She was distressed.
36	Object	Null	Mateo wrote to Valeria after the accident.	*pro* was distressed.
36	Object	Overt	Mateo wrote to Valeria after the accident.	She was distressed.

Appendix D: Filler stimuli for self-paced reading task

Filler stimuli for self-paced reading task and their English translations. Participants that read Items 37-72 in the pre-test read Items 73-108 in the post-test, and vice-versa.

Set	Filler Type	Sentence 1	Sentence 2
37	Type 1	Andrés llamó a Carla ayer por la tarde.	Ellos conversaron durante dos horas.
38	Type 1	Gonzalo ayudó a Carmen con la cena.	Ellos cocinaron durante tres horas.
39	Type 1	Guillermo fascinó a Beatriz con algunas historias interesantes.	Ellos charlaron durante mucho tiempo.
40	Type 1	Mauricio favoreció a Laura en la entrevista de trabajo.	Empezaron a trabajar juntos poco después.
41	Type 1	Agustín comprendió a Florencia después de la conversación.	Estaban de acuerdo sobre el contrato.
42	Type 1	Julio observó a Micaela en el laboratorio.	Colaboraron en el proyecto final de clase.
43	Type 1	Lorena acompañó a Federico a la tienda de Nike.	Ellos gastaron mucho dinero allí.
44	Type 1	Rocío felicitó a Arturo por el premio.	Ellos celebraron el evento con una semana de vacaciones.
45	Type 1	Alejandra interrumpió a Ricardo en clase.	Ellos discutieron un poco.
46	Type 1	Martina despertó a Sebastián por la mañana.	Llegaron tarde a la escuela.
47	Type 1	Eva invitó a Damián al concierto de rock.	Cantaron todas las canciones excepto las más nuevas.
48	Type 1	Susana se encontró a Ramón fuera del colegio.	Caminaron juntos a casa.
49	Type 2	Vicente era asistente social en una ciudad grande.	Las familias allí eran necesitadas.
50	Type 2	Luis era camarero en un restaurante.	Los clientes allí eran maleducados.
51	Type 2	Iván era bancario en Nueva York.	Los bancarios allí eran vanidosos.
52	Type 2	Joaquín era abogado para una empresa.	Los representantes allí eran expertos.
53	Type 2	Alberto era periodista en Madrid.	Los reporteros allí eran muy trabajadores.
54	Type 2	Antonio era jugador de fútbol en Portugal.	Los jóvenes allí eran bastante atléticos.
55	Type 2	Marcela era maestra de una escuela en Chicago.	Los alumnos allí eran inteligentes.
56	Type 2	Alicia era la jefa de una joyería.	Los compradores allí eran ricos.
57	Type 2	Estefanía era diputada en el gobierno.	Los políticos allí eran perezosos.
58	Type 2	Luisa era médica en un hospital grande.	Los pacientes allí eran difíciles.
59	Type 2	Virginia era pintora en la Ciudad de México.	Los artistas allí eran respetados.
60	Type 2	Camila era una chef en Miami.	Los cocineros allí eran talentosos.

Set	Filler Type	Sentence 1	Sentence 2
61	Type 3	Alfonso y Victoria tenían que preparar la cena.	Ellos cortaron las verduras primero.
62	Type 3	David y Teresa querían ir al cine.	Ellos fueron por la noche.
63	Type 3	Felipe y Noelia pensaban ir a Europa.	Ellos viajaron a Italia y a Portugal.
64	Type 3	Leonardo y Josefina querían ir a la tienda de Gucci.	Compraron muchas cosas caras allí.
65	Type 3	Óscar y Emilia tenían que jugar en el partido de fútbol.	Practicaron toda la semana.
66	Type 3	Sergio y Carolina tenían ganas de ir a la playa.	Disfrutaron de un fin de semana muy bueno.
67	Type 3	Verónica y Álvaro tenían que mudarse.	Ellos se fueron para Barcelona.
68	Type 3	Sandra y Enrique querían entrar en la competición de arte.	Ellos ganaron el primer lugar.
69	Type 3	Marina y Jesús pensaban construir una casa nueva.	Ellos pagaron mucho dinero por los materiales de construcción.
70	Type 3	Irene y Nicolás tenían que limpiar el apartamento.	Usaron toda la botella de limpiador sólo para el baño.
71	Type 3	Celia y Samuel querían publicar un libro.	Escribieron un libro de cuentos para niños.
72	Type 3	Agustina y Tomás pensaban crear un sitio web para la empresa.	Diseñaron una página muy profesional con toda la información de la empresa.
73	Type 1	Tomás aburrió a Verónica en la universidad.	Ellos hablaron sobre los insectos durante cincuenta minutos.
74	Type 1	Samuel cocinó con Marina ayer.	Ellos preparon una cena muy deliciosa.
75	Type 1	Nicolás llevó a Sandra al cine.	Ellos vieron una película de miedo.
76	Type 1	Jesús bailó con Irene en el espectáculo.	Hicieron unos pasos muy complicados.
77	Type 1	Enrique interrogó a Agustina antes de las elecciones.	Debatieron sobre muchas cosas tontas.
78	Type 1	Álvaro guio a Celia por el parque nacional.	Exploraron muchos caminos peligrosos.
79	Type 1	Carolina copió a Alfonso en el examen de matemáticas.	Ellos sacaron notas muy malas.
80	Type 1	Emilia saludó a David en la reunión.	Ellos firmaron un nuevo contrato de negocios.
81	Type 1	Josefina pagó a Felipe por la pintura.	Ellos tuvieron que negociar el precio.
82	Type 1	Noelia fue con Leonardo a la playa.	Nadaron en el agua durante mucho tiempo.
83	Type 1	Teresa entrenó a Óscar en el gimnasio.	Levantaron muchas pesas.
84	Type 1	Victoria vio a Sergio en el bar.	Decidieron tomar una cerveza juntos.
85	Type 2	Javier era agente de viajes en Florida.	Los turistas allí eran ridículos.
86	Type 2	Pablo era recepcionista en un hotel lujoso en Hollywood.	Los huéspedes allí eran famosos.
87	Type 2	Esteban era profesor de arte en París.	Los estudiantes allí eran muy creativos.

Set	Filler Type	Sentence 1	Sentence 2
88	Type 2	Francisco era enfermero en la clínica.	Los otros enfermeros allí eran muy simpáticos.
89	Type 2	Mario era el jefe de una empresa en Buenos Aires.	Los empleados allí eran trabajadores.
90	Type 2	Rafael era el director de un comité de negocios en Barcelona.	Los miembros del comité eran mayores.
91	Type 2	Valentina era una autora de ficción en Londres.	Los escritores allí eran muy conocidos.
92	Type 2	Julia era policía en Los Ángeles.	Los delincuentes allí eran violentos.
93	Type 2	Margarita era diseñadora de moda en Italia.	Los modelos allí eran delgados.
94	Type 2	Claudia era bióloga para una agencia federal.	Los científicos allí eran inteligentes.
95	Type 2	Jessica era entrenadora para un equipo de fútbol en Roma.	Los jugadores allí eran muy buenos.
96	Type 2	Lucía era arquitecta en Londres.	Los otros arquitectos allí eran meticulosos.
97	Type 3	Ramón y Lorena tenían ganas de fiesta.	Ellos bebieron mucha cerveza esa noche.
98	Type 3	Damián y Rocío decidieron ir a Argentina.	Ellos se quedaron en Buenos Aires por dos semanas.
99	Type 3	Sebastián y Alejandra tenían que hacer un examen de física.	Ellos terminaron el examen muy rápido.
100	Type 3	Ricardo y Martina decidieron salir al nuevo restaurante.	Cenaron una comida muy deliciosa.
101	Type 3	Arturo y Eva querían llegar al aeropuerto muy temprano.	Salieron de casa a las 5 de la mañana.
102	Type 3	Federico y Susana querían comer algo dulce.	Tomaron un helado despúes del almuerzo.
103	Type 3	Micaela y Andrés decidieron participar en el concurso de comer chiles.	Ellos se rindieron después del primer chile.
104	Type 3	Florencia y Gonzalo tenían ganas de ir a Australia.	Ellos ahorraron mucho antes del viaje.
105	Type 3	Laura y Guillermo tenían que buscar información para un proyecto de psicología.	Ellos encontraron unos artículos científicos interesantes.
106	Type 3	Beatriz y Mauricio tenían ganas de grabar una canción nueva.	Mezclaron un ritmo simple con varios sonidos de tecno.
107	Type 3	Carmen y Agustín decidieron abrir una tienda.	Obtuvieron un préstamo del banco después de mucho tiempo.
108	Type 3	Carla y Julio querían asistir a un concierto de Shakira.	Compraron dos entradas VIP.

English Translations

Set	Filler Type	Sentence 1	Sentence 2
37	Type 1	Andrés called Carla yesterday evening.	They talked for two hours.
38	Type 1	Gonzalo helped Carmen with dinner.	They cooked for three hours.
39	Type 1	Guillermo fascinated Beatriz with some interesting stories.	They chatted for a long time.
40	Type 1	Mauricio favored Laura in the job interview.	They started to work together shortly after.
41	Type 1	Agustín understood Florencia after the conversation.	They were in agreement about the contract.
42	Type 1	Julio observed Micaela in lab.	They collaborated on the final class project.
43	Type 1	Lorena accompanied Federico to the Nike store.	They spent a lot of money there.
44	Type 1	Rocío congratulated Arturo for the award.	They celebrated the event with a week-long vacation.
45	Type 1	Alejandra interrupted Ricardo in class.	They argued a little.
46	Type 1	Martina woke up Sebastián in the morning.	They arrived late to school.
47	Type 1	Eva invited Damián to the rock concert.	They sang all the songs except the newest ones.
48	Type 1	Susana found Ramón outside the school.	They walked home together.
49	Type 2	Vicente was a social worker in a big city.	The families there were in need.
50	Type 2	Luis was a waiter at a restaurant.	The guests there were rude.
51	Type 2	Iván was a banker in New York.	The bankers there were conceited.
52	Type 2	Joaquín was a lawyer for a business.	The representatives there were experts.
53	Type 2	Alberto was a journalist in Madrid.	The reporters there were very hard-working.
54	Type 2	Antonio was a soccer player in Portugal.	The youth there were pretty athletic.
55	Type 2	Marcela was a school teacher in Chicago.	The students there were intelligent.
56	Type 2	Alicia was the boss of a jewelery store.	The shoppers there were rich.
57	Type 2	Estefanía was a representative in government.	The politicians there were lazy.
58	Type 2	Luisa was a doctor at a big hospital.	The patients there were difficult.
59	Type 2	Virginia was a painter in Mexico City.	The artists there were respected.
60	Type 2	Camila was a chef in Miami.	The cooks there were talented.
61	Type 3	Alfonso and Victoria had to prepare dinner.	They cut the vegetables first.
62	Type 3	David and Teresa wanted to go to the movies.	They went at night.
63	Type 3	Felipe and Noelia were planning to go to Europe.	They traveled to Italy and Portugal.

Set	Filler Type	Sentence 1	Sentence 2
64	Type 3	Leonardo and Josefina wanted to go to the Gucci store.	They bought many expensive things there.
65	Type 3	Óscar and Emilia had to play in the soccer match.	They practiced all week.
66	Type 3	Sergio and Carolina felt like going to the beach.	They enjoyed a very nice weekend.
67	Type 3	Verónica and Álvaro had to move.	They left for Barcelona.
68	Type 3	Sandra and Enrique wanted to enter the art competition.	The won first place.
69	Type 3	Marina and Jesús were planning to construct a new house.	They paid a lot of money for the construction materials.
70	Type 3	Irene and Nicolás had to clean the apartment.	They used the entire bottle of cleaner just for bathroom.
71	Type 3	Celia and Samuel wanted to publish a book.	They wrote a storybook for kids.
72	Type 3	Agustina and Tomás were planning to create a website for the business.	They designed a very professional page with all the business information.
73	Type 1	Tomás bored Verónica at the university.	They talked about insects for 50 minutes.
74	Type 1	Samuel cooked with Marina yesterday.	They prepared a very delicious dinner.
75	Type 1	Nicolás took Sandra to the movies.	They saw a horror movie.
76	Type 1	Jesús danced with Irene onstage.	They did some very complicated steps.
77	Type 1	Enrique interrogated Agustina before the elections.	They debated about many silly things.
78	Type 1	Álvaro guided Celia through the national park.	They explored many dangerous trails.
79	Type 1	Carolina copied Alfonso on the math exam.	They got very bad grades.
80	Type 1	Emilia greeted David in the meeting.	They signed a new business contract.
81	Type 1	Josefina paid Felipe for the painting.	They had to negotiate the price.
82	Type 1	Noelia went with Leonardo to the beach.	They swam in the water for a long time.
83	Type 1	Teresa trained Óscar in the gym.	They lifted many weights.
84	Type 1	Victoria saw Sergio at the bar.	They decided to have a beer together.
85	Type 2	Javier was a travel agent in Florida.	The tourists there were ridiculous.
86	Type 2	Pablo was a receptionist at a luxurious hotel in Hollywood.	The guests there were famous.
87	Type 2	Esteban was an art professor in Paris.	The students there were very creative.
88	Type 2	Francisco was a nurse at a clinic.	The other nurses there were very nice.
89	Type 2	Mario was the boss of a business in Buenos Aires.	The employees there were hard-working.
90	Type 2	Rafael was the director of a business committee in Barcelona.	The committee members were older.

Set	Filler Type	Sentence 1	Sentence 2
91	Type 2	Valentina was a fiction author in London	The writers there were very well-known.
92	Type 2	Julia was a police officer in Los Angeles.	The criminals there were violent.
93	Type 2	Margarita was a fashion designer in Italy.	The models there were skinny.
94	Type 2	Claudia was a biologist for a federal agency.	The scientists there were smart.
95	Type 2	Jessica was a soccer coach in Rome.	The players there were very good.
96	Type 2	Lucía was an architect in London.	The other architects there were meticulous.
97	Type 3	Ramón and Lorena felt like partying.	They drank a lot of beer that night.
98	Type 3	Damián and Rocío decided to go to Argentina.	They stayed in Buenos Aires for two weeks.
99	Type 3	Sebastián and Alejandra had to take a physics test.	They finished the test very fast.
100	Type 3	Ricardo and Martina decided to go out to the new restaurant.	They had a very delicious meal for dinner.
101	Type 3	Arturo and Eva wanted to arrive to the airport very early.	They left home at 5 in the morning.
102	Type 3	Federico and Susana wanted to eat something sweet.	They had an ice cream after lunch.
103	Type 3	Micaela and Andrés decided to participate in the chili eating contest.	They have up after the first chili.
104	Type 3	Florencia and Gonzalo felt like going to Australia.	They saved a lot before the trip.
105	Type 3	Laura and Guillermo had to look up information for a psychology project.	They found some interesting scientific articles.
106	Type 3	Beatriz and Mauricio felt like recording a new song.	They mixed a simple rhythm with various techno sounds.
107	Type 3	Carmen and Agustín decided to open a store.	They obtained a bank loan after a long time.
108	Type 3	Carla and Julio wanted to attend a Shakira concert.	They bought two VIP tickets.

Appendix E: Comprehension questions for self-paced reading task

Comprehension questions and answers for all self-paced reading stimuli and their English translations. For the target items (1-36), participants that saw question Version A in the pre-test saw question Version B in the post-test, and vice-versa.

Set	Version	Comprehension Question	Answer
1	A	¿Estaba frustrado?	Sí
1	B	¿Dejó Alejandro a Marta/Marta a Alejandro en casa?	Sí
2	A	¿Habló Carlos con Elena/Elena con Carlos ayer?	Sí
2	B	¿Estaba tranquilo?	Sí
3	A	¿Estaba asombrado?	Sí
3	B	¿Mató Diego a Sara/Sara a Diego en el videojuego?	Sí
4	A	¿Estaba contento?	No
4	B	¿Sirvió Eduardo a Luis/Isabel a Carolina?	No
5	A	¿Agradeció Fernando a Natalia/Natalia a Fernando después del concierto?	No
5	B	¿Estaba furioso?	No
6	A	¿Evitó Ignacio a Alberto/Rebeca a Laura?	No
6	B	¿Estaba sano?	No
7	A	¿Estaba perdido?	Sí
7	B	¿Siguió Jorge a Patricia/Patricia a Jorge por el supermercado?	No
8	A	¿Sorprendió Jose a Valeria/Valeria a Jose?	Sí
8	B	¿Estaba entusiasmado?	Sí
9	A	¿Visitó Juan a Cristina/Cristina a Juan?	Sí
9	B	¿Estaba ocupado?	No
10	A	¿Besó Virginia a Sofía/David a Lucas?	No
10	B	¿Estaba relajado?	No
11	A	¿Estaba enojado?	No
11	B	¿Estudió Manuel con Ana/Ana con Manuel?	Sí
12	A	¿Estaba angustiado?	No
12	B	¿Caminó Martín con Vicente/Catalina con Victoria?	No
13	A	¿Corrió Mateo con Paula/Paula con Mateo?	Sí
13	B	¿Estaba empapado?	Sí
14	A	¿Abrazó Miguel a Silvia/Silvia a Miguel en la biblioteca?	No
14	B	¿Estaba preocupado?	Sí
15	A	¿Estaba impresionado?	Sí
15	B	¿Aplaudió Pedro a Raquel/Raquel a Pedro?	Sí
16	A	¿Estaba estresado?	No
16	B	¿Dibujó Luisa a Mónica/Felipe a Roberto?	No

Set	Version	Comprehension Question	Answer
17	A	¿Estaba ansioso?	No
17	B	¿Viajó Alicia con Leticia/Tomás con Rodrigo?	No
18	A	¿Escribió Santiago a María/María a Santiago?	Sí
18	B	¿Estaba deprimido?	Sí
19	A	¿Dejó Ana a Miguel/Miguel a Ana por la primera vez?	No
19	B	¿Estaba contenta?	No
20	A	¿Habló Catalina con Manuel/Manuel con Catalina?	Sí
20	B	¿Estaba cansada?	Sí
21	A	¿Estaba sorprendida?	Sí
21	B	¿Mató Cristina a Roberto/Roberto a Cristina en póker en casa?	No
22	A	¿Estaba fastidiada?	Sí
22	B	¿Sirvió Elena a Camila/Diego a Nicolás?	No
23	A	¿Estaba furiosa?	No
23	B	¿Agradeció Isabel a Jose/Jose a Isabel?	Sí
24	A	¿Estaba calmada?	No
24	B	¿Evitó Antonio a Pedro/Verónica a Leticia?	No
25	A	¿Siguió María a Claudia/Lucas a Gonzalo?	No
25	B	¿Estaba fascinada?	Sí
26	A	¿Estaba deprimida?	No
26	B	¿Sorprendió Marta a Ignacio/Ignacio a Marta?	Sí
27	A	¿Estaba aburrida?	Sí
27	B	¿Visitó Mónica a Alejandro/Alejandro a Mónica en la universidad?	No
28	A	¿Besó Natalia a Jorge/Jorge a Natalia en la fiesta?	Sí
28	B	¿Estaba aburrida?	No
29	A	¿Estaba concentrada?	Sí
29	B	¿Estudió Patricia con Rodrigo/Rodrigo con Patricia?	Sí
30	A	¿Estaba preocupada?	No
30	B	¿Caminó Paula con Eduardo/Eduardo con Paula por el parque?	Sí
31	A	¿Estaba orgullosa?	Sí
31	B	¿Corrió Raquel con Santiago/Santiago con Raquel?	Sí
32	A	¿Abrazó Federico a Carlos/Susana a Rebeca?	No
32	B	¿Estaba estresada?	Sí
33	A	¿Aplaudió Sara a Alejandra/Juan a Mauricio?	No
33	B	¿Estaba decepcionada?	No
34	A	¿Dibujó Silvia a Fernando/Fernando a Silvia durante un examen?	Sí
34	B	¿Estaba distraída?	Sí
35	A	¿Viajó Óscar con Martín/Teresa con Sofía?	No
35	B	¿Estaba frustrada?	No
36	A	¿Escribió Valeria a Mateo/Mateo a Valeria?	Sí
36	B	¿Estaba entusiasmada?	No
37	Filler	¿Llamó Valentina a Carla ayer?	No
38	Filler	¿Ayudó Gonzalo a Carmen con el desayuno?	No

Set	Version	Comprehension Question	Answer
39	Filler	¿Charlaron ellos durante poco tiempo?	No
40	Filler	¿Empezaron a trabajar juntos poco después?	Sí
41	Filler	¿Estaban de acuerdo sobre el contrato?	Sí
42	Filler	¿Colaboraron en el proyecto final de clase?	Sí
43	Filler	¿Acompañó Lorena a Federico?	Sí
44	Filler	¿Celebraron ellos el evento con un mes de vacaciones?	No
45	Filler	¿Interrumpió Alejandra a Ricardo?	Sí
46	Filler	¿Despertó Marcela a Teresa?	No
47	Filler	¿Invitó Eva a Damián a un concierto?	Sí
48	Filler	¿Caminaron juntos al aeropuerto?	No
49	Filler	¿Era Julia asistenta social en una ciudad grande?	No
50	Filler	¿Era Jessica camarera en un restaurante?	No
51	Filler	¿Eran vanidosos los bancarios allí?	Sí
52	Filler	¿Era abogado Joaquín?	Sí
53	Filler	¿Eran muy perezosos los reporteros allí?	No
54	Filler	¿Eran atléticos los jóvenes allí?	Sí
55	Filler	¿Eran tontos los alumnos allí?	No
56	Filler	¿Eran pobres los compradores allí?	No
57	Filler	¿Era Estefanía diputada en el gobierno?	Sí
58	Filler	¿Eran difíciles los pacientes allí?	Sí
59	Filler	¿Era Virginia pintora en Roma?	No
60	Filler	¿Era Camila una chef?	Sí
61	Filler	¿Tenían que preparar la cena Alfonso y Victoria?	Sí
62	Filler	¿Fueron ellos por la noche?	Sí
63	Filler	¿Pensaban ir a Europa Felipe y Noelia?	Sí
64	Filler	¿Compraron muchas cosas caras allí?	Sí
65	Filler	¿Practicaron sólo un día?	No
66	Filler	¿Tenían ganas de ir a la playa Sergio y Carolina?	Sí
67	Filler	¿Tenían que quedarse Verónica y Álvaro?	No
68	Filler	¿Ganaron ellos el segundo lugar?	No
69	Filler	¿Pagaron ellos poco dinero?	No
70	Filler	¿Tenían que limpiar el apartamento Irene y Claudia?	No
71	Filler	¿Querían publicar un libro Francisco y Samuel?	No
72	Filler	¿Diseñaron una página profesional?	Sí
73	Filler	¿Aburrió Tomás a Verónica?	Sí
74	Filler	¿Cocinó Samuel con Marina ayer?	Sí
75	Filler	¿Vieron ellos una película de miedo?	Sí
76	Filler	¿Hicieron unos pasos muy sencillos?	No
77	Filler	¿Debatieron sobre muchas cosas tontas?	Sí
78	Filler	¿Guio Estefanía a Celia?	No
79	Filler	¿Copió Carolina a Alfonso?	Sí
80	Filler	¿Saludó Emilia a David en una fiesta?	No

Set	Version	Comprehension Question	Answer
81	Filler	¿Tuvieron que negociar el precio ellos?	Sí
82	Filler	¿Fue Noelia con Alicia a la playa?	No
83	Filler	¿Levantaron pocas pesas?	No
84	Filler	¿Decidieron tomar un vino juntos?	No
85	Filler	¿Era Javier agente de viajes?	Sí
86	Filler	¿Eran famosos los huéspedes allí?	Sí
87	Filler	¿Eran poco creativos los estudiantes allí?	No
88	Filler	¿Era Luisa enfermera en la clínica?	No
89	Filler	¿Eran vagos los trabajadores allí?	No
90	Filler	¿Eran jóvenes los miembros del comité?	No
91	Filler	¿Era Valentina una autora de ficción?	Sí
92	Filler	¿Era Antonio policía en Los Ángeles?	No
93	Filler	¿Eran delgados los modelos allí?	Sí
94	Filler	¿Eran inteligentes los científicos allí?	Sí
95	Filler	¿Era Jessica entrenadora en Tokio?	No
96	Filler	¿Era arquitecta Lucía?	Sí
97	Filler	¿Tenían ganas de dormir Ramón y Lorena?	No
98	Filler	¿Decidieron ir a Argentina Marcela y Rocío?	No
99	Filler	¿Terminaron el examen muy rápido ellos?	Sí
100	Filler	¿Decidieron salir al nuevo restaurante Ricardo y Alberto?	No
101	Filler	¿Querían llegar temprano Arturo y Eva?	Sí
102	Filler	¿Querían comer algo dulce Federico y Susana?	Sí
103	Filler	¿Se rindieron ellos después del último chile?	No
104	Filler	¿Ahorraron ellos poco dinero?	No
105	Filler	¿Tenían que buscar información Laura y Guillermo?	Sí
106	Filler	¿Mezclaron un ritmo simple con sonidos de tecno?	Sí
107	Filler	¿Obtuvieron un préstamo muy rápido?	No
108	Filler	¿Compraron dos entradas VIP?	Sí

English Translations

Set	Version	Comprehension Question	Answer
1	A	Was he frustrated?	Yes
1	B	Did Alejandro leave Marta/Marta leave Alejandro at home?	Yes
2	A	Did Carlos talk with Elena/Elena talk with Carlos yesterday?	Yes
2	B	Was he calm?	Yes
3	A	Was he astonished?	Yes
3	B	Did Diego kill Sara/Sara kill Diego in the videogame?	Yes
4	A	Was he happy?	No
4	B	Did Eduardo serve Luis/Isabel serve Carolina?	No
5	A	Did Fernando thank Natalia/Natalia thank Fernando after the concert?	No
5	B	Was he furious?	No
6	A	Did Ignacio avoid Alberto/Rebeca avoid Laura?	No
6	B	Was he healthy?	No
7	A	Was he lost?	Yes
7	B	Did Jorge follow Patricia/Patricia follow Jorge through the grocery store?	No
8	A	Did Jose surprise Valeria/Valeria surprise Jose?	Yes
8	B	Was he excited?	Yes
9	A	Did Juan visit Cristina/Cristina visit Juan?	Yes
9	B	Was he busy?	No
10	A	Did Virginia kiss Sofía/David kiss Lucas?	No
10	B	Was he relaxed?	No
11	A	Was he mad?	No
11	B	Did Manuel study with Ana/Ana study with Manuel?	Yes
12	A	Was he distressed?	No
12	B	Did Martín walk with Vicente/Catalina walk with Victoria?	No
13	A	Did Mateo run with Paula/Paula run with Mateo?	Yes
13	B	Was he soaked?	Yes
14	A	Did Miguel hug Silvia/Silvia hug Miguel in the library?	No
14	B	Was he busy?	Yes
15	A	Was he impressed?	Yes
15	B	Did Pedro applaud Raquel/Raquel applaud Pedro?	Yes
16	A	Was he stressed?	No
16	B	Did Luisa draw Mónica/Felipe draw Roberto?	No
17	A	Was he anxious?	No
17	B	Did Alicia travel with Leticia/Tomás travel with Rodrigo?	No
18	A	Did Santiago write to María/María write to Santiago?	Yes
18	B	Was he depressed?	Yes
19	A	Did Ana leave Miguel/Miguel leave Ana for the first time?	No
19	B	Was she happy?	No
20	A	Did Catalina talked with Manuel/Manuel talk with Catalina?	Yes
20	B	Was she tired?	Yes

Set	Version	Comprehension Question	Answer
21	A	Was she surprised?	Yes
21	B	Did Cristina kill Roberto/Roberto kill Cristina in poker at home?	No
22	A	Was she annoyed?	Yes
22	B	Did Elena serve Camila/Diego serve Nicolás?	No
23	A	Was she furious?	No
23	B	Did Isabel thank Jose/Jose thank Isabel?	Yes
24	A	Was she calm?	No
24	B	Did Antonio avoid Pedro/Verónica avoid Leticia?	No
25	A	Did María follow Claudia/Lucas follow Gonzalo?	No
25	B	Was she fascinated?	Yes
26	A	Was she depressed?	No
26	B	Did Marta surprise Ignacio/Ignacio surprise Marta?	Yes
27	A	Was she bored?	Yes
27	B	Did Mónica visit Alejandro/Alejandro visit Mónica at the university?	No
28	A	Did Natalia kiss Jorge/Jorge kiss Natalia at the party?	Yes
28	B	Was she bored?	No
29	A	Was she focused?	Yes
29	B	Did Patricia study with Rodrigo/Rodrigo study with Patricia?	Yes
30	A	Was she worried?	No
30	B	Did Paula walk with Eduardo/Eduardo walk with Paula through the park?	Yes
31	A	Was she proud?	Yes
31	B	Did Raquel run with Santiago/Santiago run with Raquel?	Yes
32	A	Did Federico hug Carlos/Susana hug Rebeca?	No
32	B	Was she stressed?	Yes
33	A	Did Sara applaud Alejandra/Juan applaud Mauricio?	No
33	B	Was she disappointed?	No
34	A	Did Silvia draw Fernando/Fernando draw Silvia during a test?	Yes
34	B	Was she distracted?	Yes
35	A	Did Óscar travel with Martín/Teresa travel with Sofía?	No
35	B	Was she frustrated?	No
36	A	Did Valeria write to Mateo/Mateo write to Valeria?	Yes
36	B	Was she excited?	No
37	Filler	Did Valentina call Carla yesterday?	No
38	Filler	Did Gonzalo help Carmen with breakfast?	No
39	Filler	Did they chat for a short time?	No
40	Filler	Did they start working together soon after?	Yes
41	Filler	Did they agree on the contract?	Yes
42	Filler	Did they collaborate on the class final project?	Yes
43	Filler	Did Lorena accompany Federico?	Yes
44	Filler	Did they celebrate the event with a month of vacation?	No
45	Filler	Did Alejandra interrupt Ricardo?	Yes
46	Filler	Did Marcela wake up Teresa?	No

Set	Version	Comprehension Question	Answer
47	Filler	Did Eva invite Damián to a concert?	Yes
48	Filler	Did they walk together to the airport?	No
49	Filler	Was Julia a social worker in a big city?	No
50	Filler	Was Jessica a waitress at a restaurant?	No
51	Filler	Were the bankers there conceited?	Yes
52	Filler	Was Joaquín a lawyer?	Yes
53	Filler	Were the reporters very lazy there?	No
54	Filler	Were the youth there athletic?	Yes
55	Filler	Were the students there stupid?	No
56	Filler	Were the shoppers there poor?	No
57	Filler	Was Estefanía a representative in the government?	Yes
58	Filler	Were the patients there difficult?	Yes
59	Filler	Was Virginia a painter in Rome?	No
60	Filler	Was Camila a chef?	Yes
61	Filler	Did Alfonso and Victoria have to prepare dinner?	Yes
62	Filler	Did they go at night?	Yes
63	Filler	Were Felipe and Noelia planning to go to Europe?	Yes
64	Filler	Did they buy many expensive things there?	Yes
65	Filler	Did they practice just one day?	No
66	Filler	Did Sergio and Carolina feel like going to the beach?	Yes
67	Filler	Did Verónica and Álvaro have to stay?	No
68	Filler	Did they win second place?	No
69	Filler	Did they pay little money?	No
70	Filler	Did Irene y Claudia have to clean the apartment?	No
71	Filler	Did Francisco and Samuel want to publish a book?	No
72	Filler	Did they design a professional page?	Yes
73	Filler	Did Tomás bore Verónica?	Yes
74	Filler	Did Samuel cook with Marina yesterday?	Yes
75	Filler	Did they watch a horror movie?	Yes
76	Filler	Did they do some very simple steps?	No
77	Filler	Did they debate about many silly things?	Yes
78	Filler	Did Estefanía guide Celia?	No
79	Filler	Did Carolina copy Alfonso?	Yes
80	Filler	Did Emilia greet David at a party?	No
81	Filler	Did they have to negotiate the price?	Yes
82	Filler	Did Noelia go with Alicia to the beach?	No
83	Filler	Did they lift few weights?	No
84	Filler	Did they decide to have a glass of wine together?	No
85	Filler	Was Javier a travel agent?	Yes
86	Filler	Were the guests there famous?	Yes
87	Filler	Were the students there little creative?	No
88	Filler	Was Luisa a nurse at a clinic?	No

Set	Version	Comprehension Question	Answer
89	Filler	Were the workers there lazy?	No
90	Filler	Were the committee members young?	No
91	Filler	Was Valentina a fiction author?	Yes
92	Filler	Was Antonio a police officer in Los Angeles?	No
93	Filler	Were the models there skinny?	Yes
94	Filler	Were the scientists there smart?	Yes
95	Filler	Was Jessica a coach in Tokyo?	No
96	Filler	Was Lucía an architect?	Yes
97	Filler	Did Ramón and Lorena feel like going to sleep?	No
98	Filler	Did Marcela and Rocío decide to go to Argentina?	No
99	Filler	Did they finish the test very fast?	Yes
100	Filler	Did Ricardo and Alberto decide to go out to the new restaurant?	No
101	Filler	Did Arturo and Eva want to arrive early?	Yes
102	Filler	Did Federico and Susana want to eat something sweet?	Yes
103	Filler	Did they give up after the last chili?	No
104	Filler	Did they save little money?	No
105	Filler	Did Laura and Guillermo have to look up information?	Yes
106	Filler	Did they mix a simple rhythm with techno sounds?	Yes
107	Filler	Did they obtain a loan very fast?	No
108	Filler	Did they buy two VIP tickets?	Yes

Appendix F: Descriptions of pictures in sentence-selection task

Scene descriptions for the target (1-16) and filler items (17-24) from the sentence-selection task. English translations are provided under "Discourse" to help illustrate the relation between the story participants heard and the scene they viewed. The reader is encouraged to get in touch with the author of the original study (Vogels et al., 2013) if they wish to see the full materials.

Item	Version	Picture 1	Picture 2	Discourse
1	Continue	Woman (foreground) and man are sitting at a table with glasses of wine in front of them.	Woman stands up away from table and uses cellphone.	A woman was having a glass of wine with a man. The woman was drunk. Therefore, she/*pro* called a taxi.
1	Shift	Man (foreground) and woman are sitting at a table with glasses of wine in front of them.	Man stands up away from table and uses cellphone.	A woman was having a glass of wine with a man. The woman was drunk. Therefore, he/*pro* called a taxi.
2	Continue	Woman (foreground) and man are sitting in chairs.	Woman stands up and holds a fan.	A woman was at home with a man. The woman was very hot. Therefore, she/*pro* grabbed a fan.
2	Shift	Man (foreground) and woman are sitting in chairs.	Man stands up and holds a fan.	A woman was at home with a man. The woman was very hot. Therefore, he/*pro* grabbed a fan.
3	Continue	Woman (foreground) and man are sitting at a table; woman's head leans down as if nodding off.	Woman stands up and holds coffee cup as if bringing to table.	A woman was consulting with a man. The woman was a little sleepy. Therefore, she/*pro* got a coffee.
3	Shift	Man (foreground) and woman are sitting at a table; woman's head leans down as if nodding off.	Man stands up and holds coffee cup as if bringing to table.	A woman was consulting with a man. The woman was a little sleepy. Therefore, he/*pro* got a coffee.
4	Continue	Woman (foreground) and man are sitting in chairs.	Woman stands up and holds a book open as if reading.	A girl was in the library with a boy. The girl was interested in fiction. Therefore, she/*pro* read a novel out loud.
4	Shift	Man (foreground) and woman are sitting in chairs.	Man stands up and holds a book open as if reading.	A girl was in the library with a boy. The girl was interested in fiction. Therefore, he/*pro* read a novel out loud.
5	Continue	Woman (foreground) and man are sitting in chairs; woman is slouching as if tired.	Woman stands up and holds a pillow.	A girl was watching a movie with a boy. The girl was pretty tired. Therefore, she/*pro* got a pillow.

Item	Version	Picture 1	Picture 2	Discourse
5	Shift	Man (foreground) and woman are sitting in chairs; woman is slouching as if tired.	Man stands up and holds a pillow.	A girl was watching a movie with a boy. The girl was pretty tired. Therefore, he/*pro* got a pillow.
6	Continue	Woman (foreground) and man are sitting at a table.	Woman stands up and heads toward an Exit sign.	A woman was arguing with a man. The woman was frustrated. Therefore, she/*pro* left.
6	Shift	Man (foreground) and woman are sitting at a table.	Man stands up and heads toward an Exit sign.	A woman was arguing with a man. The woman was frustrated. Therefore, he/*pro* left.
7	Continue	Woman (foreground) and man are sitting at a table.	Woman stands up and holds a cup of water.	A girl was chatting with a boy. The girl did not feel well. Therefore, she/*pro* went to get a glass of water.
7	Shift	Man (foreground) and woman are sitting at a table.	Man stands up and holds a cup of water.	A girl was chatting with a boy. The girl did not feel well. Therefore, he/*pro* went to get a glass of water.
8	Continue	Woman (foreground) and man are sitting at a table.	Woman stands up and pours a glass of wine.	A girl was talking with a boy. The girl wanted something to drink. Therefore, she/*pro* got a bottle of wine.
8	Shift	Man (foreground) and woman are sitting at a table.	Man stands up and pours a glass of wine.	A girl was talking with a boy. The girl wanted something to drink. Therefore, he/*pro* got a bottle of wine.
9	Continue	Man (foreground) and woman are sitting at a table, as man pushes plate away and woman takes a bite of bread.	Man walks away from table with both plates in hands.	A man was eating with a woman. The man was pretty full. Therefore, he/*pro* picked up the dishes.
9	Shift	Woman (foreground) and man are sitting at a table, as man pushes plate away and woman takes a bite of bread.	Woman walks away from table with both plates in hands.	A man was eating with a woman. The man was pretty full. Therefore, she/*pro* picked up the dishes.
10	Continue	Man (foreground) and woman are sitting at a table; man has a notepad in front of him.	Man stands up and holds a shot glass with clear liquid.	A boy was sitting at a desk with a girl. The boy was very stressed. Therefore, he/*pro* got a shot of tequila.
10	Shift	Woman (foreground) and man are sitting at a table; man has a notepad in front of him.	Woman stands up and holds a shot glass with clear liquid.	A boy was sitting at a desk with a girl. The boy was very stressed. Therefore, she/*pro* got a shot of tequila.
11	Continue	Man (foreground) and woman are sitting in chairs; man is hunched over as if cold.	Man stands up and holds a blanket.	A man was sitting in the kitchen with a woman. The man was very cold. Therefore, he/*pro* got a blanket.

Item	Version	Picture 1	Picture 2	Discourse
11	Shift	Woman (foreground) and man are sitting in chairs; man is hunched over as if cold.	Woman stands up and holds a blanket.	A man was sitting in the kitchen with a woman. The man was very cold. Therefore, she/*pro* got a blanket.
12	Continue	Man (foreground) and woman are sitting in chairs.	Man stands up and holds a plate with bread.	A boy was chatting with a girl. The boy was pretty hungry. Therefore, he/*pro* made a sandwich.
12	Shift	Woman (foreground) and man are sitting in chairs.	Woman stands up and holds a plate with bread.	A boy was chatting with a girl. The boy was pretty hungry. Therefore, she/*pro* made a sandwich.
13	Continue	Man (foreground) and woman are sitting in chairs.	Man stands up and holds a beer.	A boy was watching tv with a girl. The boy was very thirsty. Therefore, he/*pro* got a beer.
13	Shift	Woman (foreground) and man are sitting in chairs.	Woman stands up and holds a beer.	A boy was watching tv with a girl. The boy was very thirsty. Therefore, she/*pro* got a beer.
14	Continue	Man (foreground) and woman are sitting in chairs.	Man stands up and walks away.	A man was negotiating with a woman. The man was a little annoyed. Therefore, he/*pro* left the conversation.
14	Shift	Woman (foreground) and man are sitting in chairs.	Woman stands up and walks away.	A man was negotiating with a woman. The man was a little annoyed. Therefore, she/*pro* left the conversation.
15	Continue	Man (foreground) and woman are sitting at a table, peeling potatoes; man makes a face as if he just cut himself.	Man stands up and holds a first-aid kit.	A man was cooking with a woman. The man cut his finger. Therefore, he/*pro* went to get a band-aid.
15	Shift	Woman (foreground) and man are sitting at a table, peeling potatoes; man makes a face as if he just cut himself.	Woman stands up and holds a first-aid kit.	A man was cooking with a woman. The man cut his finger. Therefore, she/*pro* went to get a band-aid.
16	Continue	Man (foreground) and woman are sitting in chairs.	Man stands up and heads toward an Exit sign.	A boy was talking with a girl. The boy got very bothered. Therefore, he/*pro* left.
16	Shift	Woman (foreground) and man are sitting in chairs.	Woman stands up and heads toward an Exit sign.	A boy was talking with a girl. The boy got very bothered. Therefore, she/*pro* left.
17	Filler	Man is sitting in a chair and writing in a notepad.	Man is listening to music with headphones (music symbols above head).	A boy was working on a final project. The project was for Spanish class. The boy decided to study with/without music.
18	Filler	Woman is sitting at table with laptop open.	Woman is yawning.	A girl was studying in the library. It was final exams week. The girl got bored/had fun fast.

Item	Version	Picture 1	Picture 2	Discourse
19	Filler	Man (foregrounded) and woman are sitting in chairs. Woman is looking down as if sick.	Man is standing and talking on cell-phone.	A boy and a girl were at a restaurant. The food was not well cooked. The girl felt nauseous/very good.
20	Filler	Woman (foregrounded) and man are sitting in chairs with excited faces.	Man stands up and waves hands in air as if excited.	A man and a woman were at an awards ceremony. The award for the best film was announced. The man was happy/depressed.
21	Filler	Man is standing with hands in pockets.	Man looks at wrist watch.	A man was waiting for the bus. The bus was running very late. The man looked at his watch/map frustrated.
22	Filler	Woman is sitting in chair reading a book.	Woman has nodded off (head down, eyes closed) and the book is now hanging by her side.	A woman was reading in the library. The book was very boring. The woman fell asleep/was fascinated by the book.
23	Filler	Woman and man are standing in front of each other.	Woman sits down in chair in front of man.	A girl and a boy were arguing. The argument was very long. The girl finally sat down/danced.
24	Filler	Woman (foregrounded) and man are sitting at a table.	Man leans down and covers up face with hands as if upset.	A woman and a man were at a cafe. The relationship between them ended. The man was very sad/happy.

Appendix G: Target stimuli for sentence-selection task

Target stimuli for sentence-selection task and English translations.

Item	Condition	Pronoun	Discourse
1	Continue	Overt	Una mujer estaba tomando vino con un hombre. La mujer estaba borracha. Por eso, ella llamó un taxi.
1	Shift	Overt	Una mujer estaba tomando vino con un hombre. La mujer estaba borracha. Por eso, él llamó un taxi.
1	Continue/ Shift	Null	Una mujer estaba tomando vino con un hombre. La mujer estaba borracha. Por eso, llamó un taxi.
2	Continue	Overt	Una mujer estaba en casa con un hombre. La mujer tenía mucho calor. Por eso, ella agarró un abanico.
2	Shift	Overt	Una mujer estaba en casa con un hombre. La mujer tenía mucho calor. Por eso, él agarró un abanico.
2	Continue/ Shift	Null	Una mujer estaba en casa con un hombre. La mujer tenía mucho calor. Por eso, agarró un abanico.
3	Continue	Overt	Una mujer estaba consultando con un hombre. La mujer tenía un poco de sueño. Por eso, ella trajo un café.
3	Shift	Overt	Una mujer estaba consultando con un hombre. La mujer tenía un poco de sueño. Por eso, él trajo un café.
3	Continue/ Shift	Null	Una mujer estaba consultando con un hombre. La mujer tenía un poco de sueño. Por eso, trajo un café.
4	Continue	Overt	Una chica estaba en la biblioteca con un chico. La chica estaba interesada en la ficción. Por eso, ella leyó una novela en voz alta.
4	Shift	Overt	Una chica estaba en la biblioteca con un chico. La chica estaba interesada en la ficción. Por eso, él leyó una novela en voz alta.
4	Continue/ Shift	Null	Una chica estaba en la biblioteca con un chico. La chica estaba interesada en la ficción. Por eso, leyó una novela en voz alta.
5	Continue	Overt	Una chica estaba viendo una película con un chico. La chica estaba bastante cansada. Por eso, ella trajo una almohada.
5	Shift	Overt	Una chica estaba viendo una película con un chico. La chica estaba bastante cansada. Por eso, él trajo una almohada.
5	Continue/ Shift	Null	Una chica estaba viendo una película con un chico. La chica estaba bastante cansada. Por eso, trajo una almohada.
6	Continue	Overt	Una mujer estaba discutiendo con un hombre. La mujer estaba frustrada. Por eso, ella salió.
6	Shift	Overt	Una mujer estaba discutiendo con un hombre. La mujer estaba frustrada. Por eso, él salió.
6	Continue/ Shift	Null	Una mujer estaba discutiendo con un hombre. La mujer estaba frustrada. Por eso, salió.
7	Continue	Overt	Una chica estaba charlando con un chico. La chica no se sentía bien. Por eso, ella fue a buscar un vaso de agua.
7	Shift	Overt	Una chica estaba charlando con un chico. La chica no se sentía bien. Por eso, él fue a buscar un vaso de agua.
7	Continue/ Shift	Null	Una chica estaba charlando con un chico. La chica no se sentía bien. Por eso, fue a buscar un vaso de agua.
8	Continue	Overt	Una chica estaba hablando con un chico. La chica quería algo para beber. Por eso, ella trajo una botella de vino.

Item	Condition	Pronoun	Discourse
8	Shift	Overt	Una chica estaba hablando con un chico. La chica quería algo para beber. Por eso, él trajo una botella de vino.
8	Continue/ Shift	Null	Una chica estaba hablando con un chico. La chica quería algo para beber. Por eso, trajo una botella de vino.
9	Continue	Overt	Un hombre estaba comiendo con una mujer. El hombre estaba bastante lleno. Por eso, él recogió los platos.
9	Shift	Overt	Un hombre estaba comiendo con una mujer. El hombre estaba bastante lleno. Por eso, ella recogió los platos.
9	Continue/ Shift	Null	Un hombre estaba comiendo con una mujer. El hombre estaba bastante lleno. Por eso, recogió los platos.
10	Continue	Overt	Un chico estaba sentado en un escritorio con una chica. El chico estaba muy estresado. Por eso, él trajo un tequila.
10	Shift	Overt	Un chico estaba sentado en un escritorio con una chica. El chico estaba muy estresado. Por eso, ella trajo un tequila.
10	Continue/ Shift	Null	Un chico estaba sentado en un escritorio con una chica. El chico estaba muy estresado. Por eso, trajo un tequila.
11	Continue	Overt	Un hombre estaba en la cocina con una mujer. El hombre tenía mucho frío. Por eso, él trajo una manta.
11	Shift	Overt	Un hombre estaba en la cocina con una mujer. El hombre tenía mucho frío. Por eso, ella trajo una manta.
11	Continue/ Shift	Null	Un hombre estaba en la cocina con una mujer. El hombre tenía mucho frío. Por eso, trajo una manta.
12	Continue	Overt	Un chico estaba charlando con una chica. El chico tenía bastante hambre. Por eso, él preparó un sándwich.
12	Shift	Overt	Un chico estaba charlando con una chica. El chico tenía bastante hambre. Por eso, ella preparó un sándwich.
12	Continue/ Shift	Null	Un chico estaba charlando con una chica. El chico tenía bastante hambre. Por eso, preparó un sándwich.
13	Continue	Overt	Un chico estaba viendo la televisión con una chica. El chico tenía mucha sed. Por eso, él trajo una cerveza.
13	Shift	Overt	Un chico estaba viendo la televisión con una chica. El chico tenía mucha sed. Por eso, ella trajo una cerveza.
13	Continue/ Shift	Null	Un chico estaba viendo la televisión con una chica. El chico tenía mucha sed. Por eso, trajo una cerveza.
14	Continue	Overt	Un hombre estaba negociando con una mujer. El hombre estaba un poco molesto. Por eso, él dejó la conversación.
14	Shift	Overt	Un hombre estaba negociando con una mujer. El hombre estaba un poco molesto. Por eso, ella dejó la conversación.
14	Continue/ Shift	Null	Un hombre estaba negociando con una mujer. El hombre estaba un poco molesto. Por eso, dejó la conversación.
15	Continue	Overt	Un hombre estaba cocinando con una mujer. El hombre se cortó el dedo. Por eso, él fue a buscar una curita.
15	Shift	Overt	Un hombre estaba cocinando con una mujer. El hombre se cortó el dedo. Por eso, ella fue a buscar una curita.
15	Continue/ Shift	Null	Un hombre estaba cocinando con una mujer. El hombre se cortó el dedo. Por eso, fue a buscar una curita.
16	Continue	Overt	Un chico estaba hablando con una chica. El chico se molestó mucho. Por eso, él salió.

Item	Condition	Pronoun	Discourse
16	Shift	Overt	Un chico estaba hablando con una chica. El chico se molestó mucho. Por eso, ella salió.
16	Continue/ Shift	Null	Un chico estaba hablando con una chica. El chico se molestó mucho. Por eso, salió.

English Translations

Item	Condition	Pronoun	Discourse
1	Continue	Overt	A woman was having a glass of wine with a man. The woman was drunk. Therefore, she called a taxi.
1	Shift	Overt	A woman was having a glass of wine with a man. The woman was drunk. Therefore, he called a taxi.
1	Continue/ Shift	Null	A woman was having a glass of wine with a man. The woman was drunk. Therefore, *pro* called a taxi.
2	Continue	Overt	A woman was at home with a man. The woman was very hot. Therefore, she grabbed a fan.
2	Shift	Overt	A woman was at home with a man. The woman was very hot. Therefore, he grabbed a fan.
2	Continue/ Shift	Null	A woman was at home with a man. The woman was very hot. Therefore, *pro* grabbed a fan.
3	Continue	Overt	A woman was consulting with a man. The woman was a little sleepy. Therefore, she got a coffee.
3	Shift	Overt	A woman was consulting with a man. The woman was a little sleepy. Therefore, he got a coffee.
3	Continue/ Shift	Null	A woman was consulting with a man. The woman was a little sleepy. Therefore, *pro* got a coffee.
4	Continue	Overt	A girl was in the library with a boy. The girl was interested in fiction. Therefore, she read a novel out loud.
4	Shift	Overt	A girl was in the library with a boy. The girl was interested in fiction. Therefore, he read a novel out loud.
4	Continue/ Shift	Null	A girl was in the library with a boy. The girl was interested in fiction. Therefore, *pro* read a novel out loud.
5	Continue	Overt	A girl was watching a movie with a boy. The girl was pretty tired. Therefore, she got a pillow.
5	Shift	Overt	A girl was watching a movie with a boy. The girl was pretty tired. Therefore, he got a pillow.
5	Continue/ Shift	Null	A girl was watching a movie with a boy. The girl was pretty tired. Therefore, *pro* got a pillow.
6	Continue	Overt	A woman was arguing with a man. The woman was frustrated. Therefore, she left.
6	Shift	Overt	A woman was arguing with a man. The woman was frustrated. Therefore, he left.
6	Continue/ Shift	Null	A woman was arguing with a man. The woman was frustrated. Therefore, *pro* left.
7	Continue	Overt	A girl was chatting with a boy. The girl did not feel well. Therefore, she went to get a glass of water.
7	Shift	Overt	A girl was chatting with a boy. The girl did not feel well. Therefore, he went to get a glass of water.
7	Continue/ Shift	Null	A girl was chatting with a boy. The girl did not feel well. Therefore, *pro* went to get a glass of water.
8	Continue	Overt	A girl was talking with a boy. The girl wanted something to drink. Therefore, she got a bottle of wine.
8	Shift	Overt	A girl was talking with a boy. The girl wanted something to drink. Therefore, he got a bottle of wine.

Item	Condition	Pronoun	Discourse
8	Continue/ Shift	Null	A girl was talking with a boy. The girl wanted something to drink. Therefore, *pro* got a bottle of wine.
9	Continue	Overt	A man was eating with a woman. The man was pretty full. Therefore, he picked up the dishes.
9	Shift	Overt	A man was eating with a woman. The man was pretty full. Therefore, she picked up the dishes.
9	Continue/ Shift	Null	A man was eating with a woman. The man was pretty full. Therefore, *pro* picked up the dishes.
10	Continue	Overt	A boy was sitting at a desk with a girl. The boy was very stressed. Therefore, he got a shot of tequila.
10	Shift	Overt	A boy was sitting at a desk with a girl. The boy was very stressed. Therefore, she got a shot of tequila.
10	Continue/ Shift	Null	A boy was sitting at a desk with a girl. The boy was very stressed. Therefore, *pro* got a shot of tequila.
11	Continue	Overt	A man was sitting in the kitchen with a woman. The man was very cold. Therefore, he got a blanket.
11	Shift	Overt	A man was sitting in the kitchen with a woman. The man was very cold. Therefore, she got a blanket.
11	Continue/ Shift	Null	A man was sitting in the kitchen with a woman. The man was very cold. Therefore, *pro* got a blanket.
12	Continue	Overt	A boy was chatting with a girl. The boy was pretty hungry. Therefore, he made a sandwich.
12	Shift	Overt	A boy was chatting with a girl. The boy was pretty hungry. Therefore, she made a sandwich.
12	Continue/ Shift	Null	A boy was chatting with a girl. The boy was pretty hungry. Therefore, *pro* made a sandwich.
13	Continue	Overt	A boy was watching tv with a girl. The boy was very thirsty. Therefore, he got a beer.
13	Shift	Overt	A boy was watching tv with a girl. The boy was very thirsty. Therefore, she got a beer.
13	Continue/ Shift	Null	A boy was watching tv with a girl. The boy was very thirsty. Therefore, *pro* got a beer.
14	Continue	Overt	A man was negotiating with a woman. The man was a little annoyed. Therefore, he left the conversation.
14	Shift	Overt	A man was negotiating with a woman. The man was a little annoyed. Therefore, she left the conversation.
14	Continue/ Shift	Null	A man was negotiating with a woman. The man was a little annoyed. Therefore, *pro* left the conversation.
15	Continue	Overt	A man was cooking with a woman. The man cut his finger. Therefore, he went to get a band-aid.
15	Shift	Overt	A man was cooking with a woman. The man cut his finger. Therefore, she went to get a band-aid.
15	Continue/ Shift	Null	A man was cooking with a woman. The man cut his finger. Therefore, *pro* went to get a band-aid.
16	Continue	Overt	A boy was talking with a girl. The boy got very bothered. Therefore, he left.
16	Shift	Overt	A boy was talking with a girl. The boy got very bothered. Therefore, she left.

Item	Condition	Pronoun	Discourse
16	Continue/ Shift	Null	A boy was talking with a girl. The boy got very bothered. Therefore, *pro* left.

Appendix H: Filler stimuli for sentence-selection task

Filler stimuli for sentence-selection task and English translations. Participants that saw items 17-20 in the pre-test saw items 21-24 in the post-test, and vice-versa.

Item	Correct	Discourse
17	Correct	Un chico estaba trabajando en un proyecto final. El proyecto era para la clase de español. El chico decidió estudiar con música.
17	Incorrect	Un chico estaba trabajando en un proyecto final. El proyecto era para la clase de español. El chico decidió estudiar sin música.
18	Correct	Una chica estaba estudiando en la biblioteca. Era la semana de los exámenes finales. La chica se aburrió rápido.
18	Incorrect	Una chica estaba estudiando en la biblioteca. Era la semana de los exámenes finales. La chica se divirtió rápido.
19	Correct	Un chico y una chica estaban en un restaurante. La comida no estaba bien cocinada. La chica tenía nauseas.
19	Incorrect	Un chico y una chica estaban en un restaurante. La comida no estaba bien cocinada. La chica se sentía muy bien.
20	Correct	Un hombre y una mujer estaban en una ceremonia de premios. El premio para la mejor película se anunció. El hombre se alegró.
20	Incorrect	Un hombre y una mujer estaban en una ceremonia de premios. El premio para la mejor película se anunció. El hombre se deprimió.
21	Correct	Un hombre estaba esperando el autobús. El autobús venía con mucho retraso. El hombre miró su reloj con frustración.
21	Incorrect	Un hombre estaba esperando el autobús. El autobús venía con mucho retraso. El hombre miró su mapa con frustración.
22	Correct	Una mujer estaba leyendo en la biblioteca. El libro era muy aburrido. La mujer se durmió.
22	Incorrect	Una mujer estaba leyendo en la biblioteca. El libro era muy aburrido. La mujer estaba fascinada por el libro.
23	Correct	Una chica y un chico estaban discutiendo. La discusión era muy larga. La chica se sentó por fin.
23	Incorrect	Una chica y un chico estaban discutiendo. La discusión era muy larga. La chica bailó por fin.
24	Correct	Una mujer y un hombre estaban en un café. La relación entre ellos terminó. El hombre estaba muy triste.
24	Incorrect	Una mujer y un hombre estaban en un café. La relación entre ellos terminó. El hombre estaba muy feliz.

English Translations

Item	Correct	Discourse
17	Correct	A boy was working on a final project. The project was for Spanish class. The boy decided to study with music.
17	Incorrect	A boy was working on a final project. The project was for Spanish class. The boy decided to study without music.
18	Correct	A girl was studying in the library. It was final exams week. The girl got bored fast.
18	Incorrect	A girl was studying in the library. It was final exams week. The girl had fun fast.
19	Correct	A boy and a girl were at a restaurant. The food was not well cooked. The girl felt nauseous.
19	Incorrect	A boy and a girl were at a restaurant. The food was not well cooked. The girl felt very good.
20	Correct	A man and a woman were at an awards ceremony. The award for the best film was announced. The man was happy.
20	Incorrect	A man and a woman were at an awards ceremony. The award for the best film was announced. The man was depressed.
21	Correct	A man was waiting for the bus. The bus was running very late. The man looked at his watch frustrated.
21	Incorrect	A man was waiting for the bus. The bus was running very late. The man looked at his map frustrated.
22	Correct	A woman was reading in the library. The book was very boring. The woman fell asleep.
22	Incorrect	A woman was reading in the library. The book was very boring. The woman was fascinated by the book.
23	Correct	A girl and a boy were arguing. The argument was very long. The girl finally sat down.
23	Incorrect	A girl and a boy were arguing. The argument was very long. The girl finally danced.
24	Correct	A woman and a man were at a cafe. The relationship between them ended. The man was very sad.
24	Incorrect	A woman and a man were at a cafe. The relationship between them ended. The man was very happy.

Appendix I: Training task stimuli for L2 Control group

Training stimuli for the L2 Control group and English translations. Participants saw the same picture scenarios from the pre-test sentence-selection task, but heard different descriptions of the scene that did not target pronominal reference.

Item	Pre-test version	Correct	Discourse
1	Continue	Correct	Una mujer estaba tomando vino con un hombre. La cita no iba muy bien. La mujer llamó un taxi.
1	Continue	Incorrect	Una mujer estaba tomando vino con un hombre. La cita no iba muy bien. La mujer tomó una aspirina.
1	Shift	Correct	Una mujer estaba tomando vino con un hombre. La cita no iba muy bien. El hombre llamó un taxi.
1	Shift	Incorrect	Una mujer estaba tomando vino con un hombre. La cita no iba muy bien. El hombre tomó una aspirina.
2	Continue	Correct	Una mujer estaba en casa con un hombre. Hacía calor en el salón. La mujer agarró un abanico.
2	Continue	Incorrect	Una mujer estaba en casa con un hombre. Hacía calor en el salón. La mujer agarró una cerveza.
2	Shift	Correct	Una mujer estaba en casa con un hombre. Hacía calor en el salón. El hombre agarró un abanico.
2	Shift	Incorrect	Una mujer estaba en casa con un hombre. Hacía calor en el salón. El hombre agarró una cerveza.
3	Continue	Correct	Una mujer estaba consultando con un hombre. La reunión era muy aburrida. La mujer decidió pedir un café.
3	Continue	Incorrect	Una mujer estaba consultando con un hombre. La reunión era muy aburrida. La mujer decidió pedir una cerveza.
3	Shift	Correct	Una mujer estaba consultando con un hombre. La reunión era muy aburrida. El hombre decidió pedir un café.
3	Shift	Incorrect	Una mujer estaba consultando con un hombre. La reunión era muy aburrida. El hombre decidió pedir una cerveza.
4	Continue	Correct	Una chica estaba en la biblioteca con un chico. Había muchos libros de ficción. La chica leyó un libro.
4	Continue	Incorrect	Una chica estaba en la biblioteca con un chico. Había muchos libros de ficción. La chica escribió un libro.
4	Shift	Correct	Una chica estaba en la biblioteca con un chico. Había muchos libros de ficción. El chico leyó un libro.
4	Shift	Incorrect	Una chica estaba en la biblioteca con un chico. Había muchos libros de ficción. El chico escribió un libro.
5	Continue	Correct	Una chica estaba viendo una película con un chico. Era muy tarde. La chica decidió traer una almohada.
5	Continue	Incorrect	Una chica estaba viendo una película con un chico. Era muy tarde. La chica decidió traer un café.

Item	Pre-test version	Correct	Discourse
5	Shift	Correct	Una chica estaba viendo una película con un chico. Era muy tarde. El chico decidió traer una almohada.
5	Shift	Incorrect	Una chica estaba viendo una película con un chico. Era muy tarde. El chico decidió traer un café.
6	Continue	Correct	Una mujer estaba sentada con un hombre. La conversación era muy frustrante. La mujer decidió salir.
6	Continue	Incorrect	Una mujer estaba sentada con un hombre. La conversación era muy frustrante. La mujer decidió bailar.
6	Shift	Correct	Una mujer estaba sentada con un hombre. La conversación era muy frustrante. El hombre decidió salir.
6	Shift	Incorrect	Una mujer estaba sentada con un hombre. La conversación era muy frustrante. El hombre decidió bailar.
7	Continue	Correct	Una chica estaba charlando con un chico. La charla era muy larga. La chica fue por un vaso de agua.
7	Continue	Incorrect	Una chica estaba charlando con un chico. La charla era muy larga. La chica fue por un sándwich.
7	Shift	Correct	Una chica estaba charlando con un chico. La charla era muy larga. El chico fue por un vaso de agua.
7	Shift	Incorrect	Una chica estaba charlando con un chico. La charla era muy larga. El chico fue por un sándwich.
8	Continue	Correct	Una chica estaba hablando con un chico. Era viernes por la tarde. La chica sirvió una copa de vino.
8	Continue	Incorrect	Una chica estaba hablando con un chico. Era viernes por la tarde. La chica sirvió una taza de té.
8	Shift	Correct	Una chica estaba hablando con un chico. Era viernes por la tarde. El chico sirvió una copa de vino.
8	Shift	Incorrect	Una chica estaba hablando con un chico. Era viernes por la tarde. El chico sirvió una taza de té.
9	Continue	Correct	Un hombre estaba comiendo con una mujer. Había muchos platos sucios. El hombre recogió los platos.
9	Continue	Incorrect	Un hombre estaba comiendo con una mujer. Había muchos platos sucios. El hombre recogió las botellas.
9	Shift	Correct	Un hombre estaba comiendo con una mujer. Había muchos platos sucios. La mujer recogió los platos.
9	Shift	Incorrect	Un hombre estaba comiendo con una mujer. Había muchos platos sucios. La mujer recogió las botellas.
10	Continue	Correct	Un chico estaba sentado en un escritorio con una chica. El estrés de los exámenes finales era evidente. El chico decidió servir un tequila.
10	Continue	Incorrect	Un chico estaba sentado en un escritorio con una chica. El estrés de los exámenes finales era evidente. El chico decidió servir una pizza.
10	Shift	Correct	Un chico estaba sentado en un escritorio con una chica. El estrés de los exámenes finales era evidente. La chica decidió servir un tequila.
10	Shift	Incorrect	Un chico estaba sentado en un escritorio con una chica. El estrés de los exámenes finales era evidente. La chica decidió servir una pizza.
11	Continue	Correct	Un hombre estaba en la cocina con una mujer. Hacía mucho frío dentro de la casa. El hombre decidió traer una manta.
11	Continue	Incorrect	Un hombre estaba en la cocina con una mujer. Hacía mucho frío dentro de la casa. El hombre decidió traer un té caliente.

Item	Pre-test version	Correct	Discourse
11	Shift	Correct	Un hombre estaba en la cocina con una mujer. Hacía mucho frío dentro de la casa. La mujer decidió traer una manta.
11	Shift	Incorrect	Un hombre estaba en la cocina con una mujer. Hacía mucho frío dentro de la casa. La mujer decidió traer un té caliente.
12	Continue	Correct	Un chico estaba charlando con una chica. Era la hora de comer. El chico preparó un sándwich.
12	Continue	Incorrect	Un chico estaba charlando con una chica. Era la hora de comer. El chico preparó una sopa.
12	Shift	Correct	Un chico estaba charlando con una chica. Era la hora de comer. La chica preparó un sándwich.
12	Shift	Incorrect	Un chico estaba charlando con una chica. Era la hora de comer. La chica preparó una sopa.
13	Continue	Correct	Un chico estaba viendo la televisión con una chica. El programa era muy largo. El chico tomó una cerveza durante los anuncios.
13	Continue	Incorrect	Un chico estaba viendo la televisión con una chica. El programa era muy largo. El chico tomó un café durante los anuncios.
13	Shift	Correct	Un chico estaba viendo la televisión con una chica. El programa era muy largo. La chica tomó una cerveza durante los anuncios.
13	Shift	Incorrect	Un chico estaba viendo la televisión con una chica. El programa era muy largo. La chica tomó un café durante los anuncios.
14	Continue	Correct	Un hombre estaba negociando con una mujer. Había mucho conflicto. El hombre decidió dejar la conversación.
14	Continue	Incorrect	Un hombre estaba negociando con una mujer. Había mucho conflicto. El hombre decidió contar un chiste.
14	Shift	Correct	Un hombre estaba negociando con una mujer. Había mucho conflicto. La mujer decidió dejar la conversación.
14	Shift	Incorrect	Un hombre estaba negociando con una mujer. Había mucho conflicto. La mujer decidió contar un chiste.
15	Continue	Correct	Un hombre estaba pelando papas con una mujer. Los cuchillos estaban muy afilados. El hombre trajo unas curitas.
15	Continue	Incorrect	Un hombre estaba pelando papas con una mujer. Los cuchillos estaban muy afilados. El hombre trajo más papas.
15	Shift	Correct	Un hombre estaba pelando papas con una mujer. Los cuchillos estaban muy afilados. La mujer trajo unas curitas.
15	Shift	Incorrect	Un hombre estaba pelando papas con una mujer. Los cuchillos estaban muy afilados. La mujer trajo más papas.
16	Continue	Correct	Un chico estaba hablando con una chica. Había mucha tensión. El chico decidió salir.
16	Continue	Incorrect	Un chico estaba hablando con una chica. Había mucha tensión. El chico decidió leer un libro.
16	Shift	Correct	Un chico estaba hablando con una chica. Había mucha tensión. La chica decidió salir.
16	Shift	Incorrect	Un chico estaba hablando con una chica. Había mucha tensión. La chica decidió leer un libro.

English Translations

Item	Pre-test version	Correct	Discourse
1	Continue	Correct	A woman was having a glass of wine with a man. The was not going very well. The woman called a taxi.
1	Continue	Incorrect	A woman was having a glass of wine with a man. The was not going very well. The woman took an aspirin.
1	Shift	Correct	A woman was having a glass of wine with a man. The was not going very well. The man called a taxi.
1	Shift	Incorrect	A woman was having a glass of wine with a man. The was not going very well. The man took an aspirin.
2	Continue	Correct	A woman was at home with a man. It was hot in the living room. The woman grabbed a fan.
2	Continue	Incorrect	A woman was at home with a man. It was hot in the living room. The woman grabbed a beer.
2	Shift	Correct	A woman was at home with a man. It was hot in the living room. The man grabbed a fan.
2	Shift	Incorrect	A woman was at home with a man. It was hot in the living room. The man grabbed a beer.
3	Continue	Correct	A woman was consulting with a man. The woman meeting was very boring. The woman decided to order a coffee.
3	Continue	Incorrect	A woman was consulting with a man. The woman meeting was very boring. The woman decided to order a beer.
3	Shift	Correct	A woman was consulting with a man. The woman meeting was very boring. The man decided to order a coffee.
3	Shift	Incorrect	A woman was consulting with a man. The woman meeting was very boring. The man decided to order a beer.
4	Continue	Correct	A girl was in the library with a boy. There were many fiction books. The girl read a book.
4	Continue	Incorrect	A girl was in the library with a boy. There were many fiction books. The girl wrote a book.
4	Shift	Correct	A girl was in the library with a boy. There were many fiction books. The boy read a book.
4	Shift	Incorrect	A girl was in the library with a boy. There were many fiction books. The boy wrote a book.
5	Continue	Correct	A girl was watching a movie with a boy. It was very late. The girl decided to get a pillow.
5	Continue	Incorrect	A girl was watching a movie with a boy. It was very late. The girl decided to get a coffee.
5	Shift	Correct	A girl was watching a movie with a boy. It was very late. The boy decided to get a pillow.
5	Shift	Incorrect	A girl was watching a movie with a boy. It was very late. The boy decided to get a coffee.
6	Continue	Correct	A woman was arguing with a man. The conversation was very frustrating. The woman decided to leave.
6	Continue	Incorrect	A woman was arguing with a man. The conversation was very frustrating. The woman decided to dance.
6	Shift	Correct	A woman was arguing with a man. The conversation was very frustrating. The man decided to leave.

Item	Pre-test version	Correct	Discourse
6	Shift	Incorrect	A woman was arguing with a man. The conversation was very frustrating. The man decided to dance.
7	Continue	Correct	A girl was chatting with a boy. The chat was very long. The girl went to get a glass of water.
7	Continue	Incorrect	A girl was chatting with a boy. The chat was very long. The girl went to get a sandwich.
7	Shift	Correct	A girl was chatting with a boy. The chat was very long. The boy went to get a glass of water.
7	Shift	Incorrect	A girl was chatting with a boy. The chat was very long. The boy went to get a sandwich.
8	Continue	Correct	A girl was talking with a boy. It was Friday evening. The girl served a glass of wine.
8	Continue	Incorrect	A girl was talking with a boy. It was Friday evening. The girl served a cup of tea.
8	Shift	Correct	A girl was talking with a boy. It was Friday evening. The boy served a glass of wine.
8	Shift	Incorrect	A girl was talking with a boy. It was Friday evening. The boy served a cup of tea.
9	Continue	Correct	A man was eating with a woman. There were many dirty plates. The man picked up the plates.
9	Continue	Incorrect	A man was eating with a woman. There were many dirty plates. The man picked up the bottles.
9	Shift	Correct	A man was eating with a woman. There were many dirty plates. The woman picked up the plates.
9	Shift	Incorrect	A man was eating with a woman. There were many dirty plates. The woman picked up the bottles.
10	Continue	Correct	A boy was sitting at a desk with a girl. The stress of final exams was obvious. The boy decided to serve a shot of tequila.
10	Continue	Incorrect	A boy was sitting at a desk with a girl. The stress of final exams was obvious. The boy decided to serve a pizza.
10	Shift	Correct	A boy was sitting at a desk with a girl. The stress of final exams was obvious. The girl decided to serve a shot of tequila.
10	Shift	Incorrect	A boy was sitting at a desk with a girl. The stress of final exams was obvious. The girl decided to serve a pizza.
11	Continue	Correct	A man was sitting in the kitchen with a woman. It was very cold inside the house. The man decided to fetch a blanket.
11	Continue	Incorrect	A man was sitting in the kitchen with a woman. It was very cold inside the house. The man decided to fetch a hot tea.
11	Shift	Correct	A man was sitting in the kitchen with a woman. It was very cold inside the house. The woman decided to fetch a blanket.
11	Shift	Incorrect	A man was sitting in the kitchen with a woman. It was very cold inside the house. The woman decided to fetch a hot tea.
12	Continue	Correct	A boy was chatting with a girl. It was time to eat. The boy made a sandwich.
12	Continue	Incorrect	A boy was chatting with a girl. It was time to eat. The boy made soup.
12	Shift	Correct	A boy was chatting with a girl. It was time to eat. The girl made a sandwich.

Item	Pre-test version	Correct	Discourse
12	Shift	Incorrect	A boy was chatting with a girl. It was time to eat. The girl made soup.
13	Continue	Correct	A boy was watching tv with a girl. The show was very long. The boy had a beer during the commercials.
13	Continue	Incorrect	A boy was watching tv with a girl. The show was very long. The boy had a coffee during the commercials.
13	Shift	Correct	A boy was watching tv with a girl. The show was very long. The girl had a beer during the commercials.
13	Shift	Incorrect	A boy was watching tv with a girl. The show was very long. The girl had a coffee during the commercials.
14	Continue	Correct	A man was negotiating with a woman. There was a lot of conflict. The man decided to leave the conversation.
14	Continue	Incorrect	A man was negotiating with a woman. There was a lot of conflict. The man decided to tell a joke.
14	Shift	Correct	A man was negotiating with a woman. There was a lot of conflict. The woman decided to leave the conversation.
14	Shift	Incorrect	A man was negotiating with a woman. There was a lot of conflict. The woman decided to tell a joke.
15	Continue	Correct	A man was cooking with a woman. The knives were very sharp. The man brought some band-aids.
15	Continue	Incorrect	A man was cooking with a woman. The knives were very sharp. The man brought more potatoes.
15	Shift	Correct	A man was cooking with a woman. The knives were very sharp. The woman brought some band-aids.
15	Shift	Incorrect	A man was cooking with a woman. The knives were very sharp. The woman brought more potatoes.
16	Continue	Correct	A boy was talking with a girl. There was a lot of tension. The boy decided to leave.
16	Continue	Incorrect	A boy was talking with a girl. There was a lot of tension. The boy decided to read a book.
16	Shift	Correct	A boy was talking with a girl. There was a lot of tension. The girl decided to leave.
16	Shift	Incorrect	A boy was talking with a girl. There was a lot of tension. The girl decided to read a book.