Spanish Speakers' Acquisition of English Subject-Verb Inversion: Evidence from Satiation

Monica Do, Elsi Kaiser, and Maria Luisa Zubizarreta

1. Introduction

One of the primary challenges in language acquisition in general, and second language acquisition in particular, is learning how to mentally represent the grammatical structure of a target language. Prior research has indicated that in some domains – like adjective-noun ordering (Gass and Ard 1984) or grammatical gender agreement (White et al 2004; Montrul 2004) – it is possible for second language learners to quickly acquire a very native-like representation of the target language. But, in other linguistic domains, like filler-gap resolution (Marinis et al 2005), anaphor resolution (Felser and Cunnings 2011), or subject-verb agreement (Parodi et al 2004), native-like acquisition of the target grammar seems comparably more difficult. At stake, then, is not simply the question of whether any particular linguistic phenomenon is transferred from a first language (L1), but more specifically, what contributes to the strength and durability of L1 interference in a second, non-native, language (L2).

The current work contributes to research on the nature of transfer by investigating how native Spanish speakers acquire Subject-Verb Inversion (SVI) – the requirement that a verbal element precede the subject in interrogative sentences – in English. Both English and Spanish require SVI in *wh*-questions, as illustrated in (1).

(1) a.   What will **John** <u>buy</u> at the store?
   b.   *What **John** <u>will buy</u> at the store?
   c.   ¿Qué   <u>comprará</u>   **Juan** en la   tienda?
       What   <u>buy.3s.fut</u>   **Juan** in the   store?
      'What will Juan buy at the store?'
   d.   *¿Qué **Juan** <u>comprará</u>   en la   tienda?
        What **Juan** <u>buy.3s.fut</u>   in the   store?
      'What Juan will buy at the store?'

Notably, although the overt word order for both English and Spanish SVI appear to be largely the same (e.g. *wh*-element + finite verb + subject), SVI is known to be difficult for native Spanish speakers learning English (White 1985; Montrul 2004; Pozzan and Quirk, 2014). Similarly, evidence from native English speakers (Cuza 2013; Frank 2013; among others) suggests that L2 (and even heritage) learners also struggle to acquire SVI in the Spanish target language. Given the word order similarity in cases like (1), it is unclear why this acquisition difficulty exists *if* the SVI phenomenon is indeed the same in English and Spanish. In fact, as we will see in Section 2.1 below, recent research suggests that English and Spanish SVI are syntactically different.

Our work diverges from most recent research related to Spanish acquisition of English SVI (Cuza 2013; Frank 2013; Cabrera and Mejia 2008; etc.), in two crucial ways: First, it operates from the assumption that SVI in Spanish is *fundamentally different* than SVI in English. (We present evidence for this assumption in Section 2.1). Secondly, we test native Spanish speakers' acquisition of English

SVI in embedded and in main clause interrogatives using a new tool in second language research, known as syntactic satiation. Thus, this paper begins with a brief overview of the syntax of SVI in English versus Spanish, including recent experimental evidence highlighting the difference between English and Spanish Inversion.

In Section 3, we introduce the current study, which builds on these fundamental syntactic differences, in order to investigate how native Spanish speakers acquire SVI in English. We do so by introducing measures from syntactic satiation – a phenomenon where repeated exposure to an ungrammatical sentence makes the sentence sound more acceptable (Snyder 2000; Braze 2002; Hiramatsu 2000; Goodall 2011; etc.) – into second language research. In our study, native Spanish speakers who are proficient in English rated the acceptability of English sentences.

Our results, presented in Sections 4 and 5, show that when we look at participants' performance on average across the entire experiment, we find no differences between native and L2 English speakers in the overall ratings for ungrammatical interrogatives (1b), which seems to signal fully native-like acquisition of English SVI by the native Spanish speakers. However, when we look for the presence/absence of satiation in participants' ratings (i.e., whether participants rate ungrammatical sentences better after they have been exposed to multiple tokens of the ungrammatical sentences), we find that Spanish speakers' ratings for these ungrammatical English interrogatives improve with increased exposure – in striking contrast to native English speakers, whose ratings stay low. The pattern exhibited by the native Spanish speakers emulates ratings for ungrammatical SVI sentences in Spanish, which is known to satiate, but not for ungrammatical English sentences, which do not satiate (Goodall 2011). Thus, our results indicated that even proficient Spanish speakers do not represent English SVI in a fully native-like manner and instead, transfer the structure of Spanish SVI into English. We conclude in Section 6 with future avenues of research and broader implications that this project may have for adult language acquisition.

2. Overview of the literature
2.1. The syntax of English and Spanish Subject-Verb Inversion

Unlike their declarative counterparts (2), where the subject canonically precedes the main verb, root *wh*-questions in both Spanish and English (3) require a verbal element to precede the subject.[1] Because of this parallel in the overt word order of interrogatives, traditional accounts of English and Spanish SVI have unified them under verb-driven I-to-C movement (Rizzi 1996; Torrego 1984; Zagona 2002).

(2) a. **John** will buy an apple.
    b. **Juan** comprará   una   manzana.
       Juan buy.3s.fut   an   apple.

(3) a. ¿Qué   comprará   **Juan** en   la   tienda?
       What buy.3s.fut   Juan   in   the   store?
       'What will Juan buy at the store?'
    b. *¿Qué **Juan** comprará   en la   tienda?
        What   Juan buy.3s.fut   at   the   store?
    c. What will **John** buy at the store?
    d. *What **John** will buy at the store?

---

[1] The fact that it is the main verb that undergoes movement in Spanish, but the auxiliary verb that does so in English is inconsequential to the I-to-C analysis. According to that analysis, this is simply because the Spanish verb (which bears all the relevant tense features) is allowed to raise to I^0 and then enter into a Spec-Head relation that checks the *wh*-feature in C. The English main verb, by contrast, cannot raise to I^0 and must therefore, be supported by an auxiliary verb. Consequently, because it is the auxiliary verb that raises to I^0, it thus follows that the auxiliary verb will then undergo the subsequent movement into C^0. Crucially, in both Spanish and English, a tense-bearing element moves from I^0 to C^0 to check the *wh*-feature.
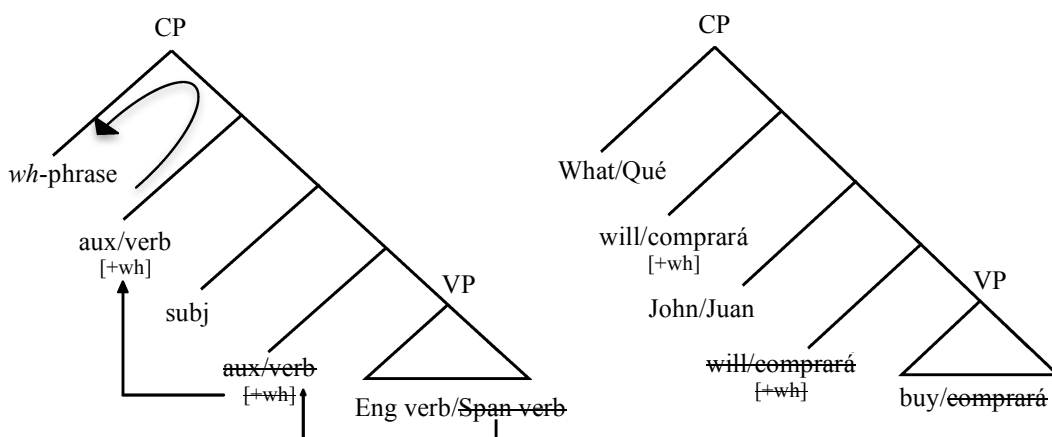
Figure 1 Analysis of SVI in English and Spanish according to unificational accounts: I-to-C movement creates Spec-Head relationship between *wh*-phrase & aux/verb checks *wh*-feature, satisfying *wh*-Criterion

In English, the auxiliary verb 'will' undergoes head-to-head movement, raising from its initial position in I^0 to the C^0 position; similarly, in order to form a licit Spanish question, the main verb 'comprará' first raises to I^0 and then proceeds to C^0 (Rizzi 1996). In both Spanish and English, this movement is driven by the *wh*-Criterion, which requires head-to-head movement to satisfactorily check the *wh*-feature in the adjacent SpecCP. However, despite the intuitive appeal of a uniform cross-linguistic theory of SVI, there is nevertheless evidence to suggest that these phenomena have different underlying derivations in English and Spanish, despite their superficial similarities.

SVI in English, for instance, applies strictly and in limited syntactic contexts: Inversion is required for root questions but illicit if the *wh*-element is not part of the matrix clause question, a pattern that is reminiscent of the Germanic V2 phenomenon (1a-b; 4a-b).[2] By contrast, both root and embedded Spanish interrogatives (1c-d; 4c-d) surface with the verb-subject order. Furthermore, while Spanish declaratives often take the SVO order, the inverted VSO order is also grammatical in Spanish declaratives (4e; Zubizarreta 1998), suggesting that Spanish inversion can be attributed to something more general than verb movement to fulfill the *wh*-Criterion, especially given the possibility of inversion in declarative sentences where there is no *wh*-Criterion to satisfy (Zubizarreta 1998; Barbosa 2001; Cardinaletti 2006; Ordoñez and Olarrea 2006).

(4) a. I wonder [what **John** <u>will</u> buy].
　　b. *I wonder [what <u>will</u> **John** buy].
　　c. Me　　　pregunto　　　[qué　<u>comprará</u>　　**Juan**]
　　　　Myself　ask.1s.pres　　　what　buy.3s.fut　　Juan.
　　　　'I wonder what John will buy.'
　　d. *Me　　　pregunto　　　[qué　**Juan**　　<u>comprará</u>]
　　　　Myself　ask.1s.pres　　　what　Juan　　buy.3s.fut
　　　　'I wonder what John will buy.'
　　e. Todos los dias　compra　Juan　una　　manzana.
　　　　Everyday　　　buys　　Juan　an　　apple.
　　　　'Juan buys an apple every day.'

---

[2] Some dialects of English, like Irish English (McCloskey 2006) and African American Vernacular English (AAVE; Labov et al 1968), do permit inversion in embedded contexts without the direct discourse (e.g. I wonder, "What will John buy?") reading. Similarly, some Caribbean dialects of Spanish (Ordoñez and Olarrea 2006) do not require SVI in embedded clauses. See also Stringer (2015) for recent discussion regarding the possibility of inversion in embedded clauses in various English dialects. This paper will focus only on standard varieties of American English and Peninsular Spanish.

Even in root *wh*-questions, inversion does not seem to be required as strictly in Spanish as it does in English. In Spanish, changes to the nature of the *wh*-phrase, itself, can influence the acceptability of uninverted questions. Adjunct questions, for instance, are dispreferred, but are not ungrammatical (5; Suñer 1994). Similarly, altering the specificity of the *wh*-phrase (6) also improves the acceptability of uninverted Spanish questions (Ordonez and Olarrea 2006; Goodall 2004). Uninverted English sentences, however, are insensitive to these manipulations and therefore remain ungrammatical regardless of the argument status (5) and/or specificity (6) of the *wh*-phrase.

(5) a. ¿Cuándo <u>comprará</u> **Juan** ese libro?
       When buy.3s.fut Juan that book?
      'When did Juan buy that book?'
   b. ¿Cuándo **Juan** <u>comprará</u> ese libro?
       When Juan buy.3s.past that book?
   c. When <u>will</u> **Juan** <u>buy</u> that book?
   d. *When **Juan** <u>will buy</u> that book?

(6) a. * ¿Qué **Ana** <u>leyó</u>?
       What Ana read.3s.past?
       'What did Ana read?'
   b. ?? ¿Cuáles de esos libros **Ana** <u>leyó</u>?
       Which of those books Ana read.3s.past?
       'Which of those books did Ana read?'
   c. *What **Ana** <u>read</u>?
   d. *Which of those books **Ana** <u>read</u>?

<div align="right">(Goodall 2004, pg. 104)</div>

Further evidence for a fundamental difference in the mechanism for inversion in English and Spanish comes from SVI's interaction with polarity items (Zubizarreta 2007). In Spanish, simply adding a polarity item is sufficient to obviate the need for inversion (7 illustrates this with a negative polarity item, but non-inversion is also acceptable for Spanish positive polarity items). This is not, however, true for English, which requires SVI in interrogatives even in cases where there is a polarity item.[3] Again, it seems that while English SVI may be strictly related to checking a *wh*-feature, this requirement is not as strict in Spanish, where SVI is not necessary for grammaticality.

(7) a. ¿Qué diarios **Juana** no <u>lee</u> nunca?
       What newspapers Juana neg read.3s.pres never?
       'What newspapers does Juana never read?'
   b. ¿Qué diarios no <u>lee</u> **Juana** nunca?

<div align="right">(Zubizarreta 2007, pg. 351)</div>

   c. What newspapers does **Joanna** never <u>read</u>?
   d. *What newspapers **Joanna** never <u>reads</u>?
   e. Never has Joanna ever read the *Wall Street Journal*.

It seems then, that syntactically, there is reason to believe that SVI in *English and Spanish is the consequence of two different phenomena*. Given the different patterns observed here we believe that one possibility is that English SVI can be characterized as a result of verb movement from I-to-C, whereas inversion in Spanish is a matter of licensing movement of the subject from SpecIP to some intermediate position above the raised verb in the C-domain. In English, because the auxiliary must mandatorily move to C^0, there is no intermediate position between the *wh*-phrase and the auxiliary and

---

[3] Interestingly, altering the polarity of English sentences also licenses inversion in English declaratives like *'Never have I ever'* or *'Hardly had I begun'*, etc. Crucially, though, English questions still required inversion, even in the presence of a polarity item. If it is possible for I-to-C movement/inversion to be facilitated by opening up an intermediate position by the subject (Zubizarreta 2007), we might also suspect that these instances in English may be accounted for using a Spanish subject-licensing hypothesis. While this parallel is interesting, it is beyond the scope of this paper to explore.

therefore, no position for the subject. English sentences where there is no inversion remain ungrammatical in spite of changes to the subject and *wh*-question because subject-movement is never possible. This does not seem to be the case for Spanish. As shown in examples (5-7), it is sometimes possible in Spanish for the subject to precede the verb, indicating that – at least in these cases – there must exist an intermediary position between the *wh*-phrase and the verb available for subject-movement. Thus, unlike the strict grammatical requirements of English, there is a less stringent grammatical requirement for Inversion in Spanish. Given this discrepancy in the strength of the grammatical requirement for SVI in English and Spanish, one might wonder whether this will be reflected in the processing behaviors of English versus Spanish speakers.

2.2. Satiation: Behavioral evidence for different types of Subject-Verb Inversions

Syntactic satiation is the phenomenon where "sentences that were initially judged ungrammatical begin to sound increasingly acceptable" after repeated exposures (Snyder 2000, p. 575). In an initial experiment explicitly testing the nature and breadth of the satiation phenomenon, Snyder (2000) asked native English speakers to determine the grammaticality ('Yes', grammatical/'No', ungrammatical) of canonically ungrammatical *wh*-questions (e.g. Subject Islands, Complex-NP Islands, Adjunct Islands, among others). He then measured the satiability of each type of *wh*-sentence by comparing the number of 'Yes' responses in the first two blocks of exposure against the last two blocks of exposures. Notably, Snyder found that "satiation is not an across-the-board phenomenon affecting all sentence types equally" (Snyder 2000, pg. 580), but rather that only some sentences are susceptible to satiation, while others seem non-satiable.

Since Snyder's original observation, views have diverged not only on what precisely is responsible for satiation but also on its implications. One view (Braze 2002; Goodall 2011; etc.) is that in the case of sentences that improve after multiple exposures (i.e., exhibit satiation), the initial impression of ungrammaticality is not due to syntactically-determined ungrammatically but rather to processing difficulties. By contrast, in the case of sentences that are still perceived as 'bad' even after multiple exposures (i.e., no satiation), the initial (and persisting) impression of ungrammaticality is due to principles derived from Universal Grammar. This view is distinct from those that link satiability not with processing, but with the strength of the formal properties of the grammar: weak grammatical constraints tend to show an effect of satiation while stronger constraints are non-satiable (Snyder 2000; Hiramatsu 2000; etc.) According to this second view satiation might be a behavioral side effect of relaxing a weaker principle in the grammar.

Though satiation research has been relatively limited to English, recent work by Goodall (2011) has extended the scope of investigation to Spanish. His study used the phenomenon of satiation to provide additional evidence for supporting SVI as instantiated by two different syntactic phenomena in English and Spanish (see Section 2.1 above). Specifically, Goodall (2011) asked monolingual English and monolingual Spanish speakers, in their respective languages, to judge the acceptability of *wh*-questions where the subject and verb were not inverted. Each participant rated a total of five different tokens of the ungrammatical (i.e. uninverted) root question by answering 'Yes' if the sentence sounded "right" to them (Goodall 2011, pg. 36), and 'No' otherwise.

Goodall (2011) used two different methods to determine whether uninverted sentences in English and Spanish had undergone satiation. Using the first method (counting number of Yes-to-No switches), Goodall found no effect of satiation among his 45 English speakers, but among his 59 Spanish speakers, there was a significant effect of satiation. Results using the second method (comparing average number of 'Yes' ratings) yielded largely the same result. For the English speakers, there was no significant difference in the number of 'Yes' answers during the early versus the later trials; meanwhile, for Spanish speakers, there was a marginally significant increase in the number of 'Yes' responses in the late trials.

The pattern that emerged was as follows: Uninverted *English* sentences were judged to be equally ungrammatical after repeated exposure while uninverted *Spanish* interrogatives seemed to improve, or 'satiate', after repeated exposure. According to Goodall, if the principle motivating both English and Spanish SVI were one and the same, it would be difficult to explain why that same principle would be subject to extra-linguistic influence (e.g. number of exposures) in Spanish, but not in English.

Given the data from Section 2.1 (e.g. in some root clauses it is possible for the Spanish subject to intervene between the *wh*-phrase and the verb, whereas in English root clauses, this is never a

possibility), one interpretation of the behavioral differences between English and Spanish observed by Goodall (2011) would be to posit that satiation in Spanish is tied to relaxing the principle that licenses the intermediate position below the *wh*-phrase and above the verb to accommodate the movement of the subject.[4] In English, movement of the auxiliary blocks movement of the subject, so there is no possible position for the subject. As a result, SVI in English is non-negotiable and there is no satiation. In other words, satiation in Spanish might be a reflex of the existence of a potential structural position to host the subject; satiation is not possible in English because there is no structural position for the intervening subject to occupy.

While it is still unclear what exactly underlies the satiation phenomenon, we nevertheless believe that it is valuable to import this tool into the realm of second language research as a potential indicator of "native-like" proficiency.

3. Current Study

As we saw in Section 2, recent evidence – both theoretical (Goodall 2004; Barbosa 2001; Suñer 1994; etc.) and experimental (Goodall 2011) – challenges the traditional approach of treating English and Spanish SVI as the same phenomenon. In our experiment, we ask how adult Spanish speakers learning English as a second language might be representing SVI, a phenomenon that is superficially similar in English and Spanish but differs in the underlying syntax. We do so by comparing acceptability ratings from native English speakers against the ratings from L1 Spanish/L2 English speakers, first collapsing all trials and then examining the critical satiation data by looking at ratings in the first half versus last half of the study. Data from the overall ratings showed very similar results for native English and native Spanish speakers. While this would typically suggest that native Spanish speakers have reached native-like attainment of English SVI, a closer look at the rating data using a measure of satiation suggests that, in fact, L1 Spanish/L2 English speakers were representing inversion through transfer from the Spanish L1. Taken together, these results suggest that while L1 Spanish/L2 English speakers' judgments appeared native-like, the underlying representations were not.

3.1. Methods

We used a sentence judgment task similar to the one used by Goodall (2011). The study was administered over the internet. Both native English and L1 Spanish/L2 English participants were asked to rate the acceptability of *English* sentences using a five-point scale.

3.1.1. Participants

Participants included 32 native speakers of American English with no background in Spanish and 23 native speakers of Peninsular Spanish with mid-to-high English proficiency. In total, 31 L1 Spanish/L2 English speakers participated, but 9 of these participants scored below 50% in the cloze task (see Section 3.1.3) and were thus excluded from analysis.[5] Participants were entered into a raffle to win gift cards in exchange for their participation.

Proficiency levels for native Spanish speakers were assessed via a single-passage cloze test where they were asked to fill in missing words (Yin 2012; Oshita 1997). To determine a baseline measure of 'native-like' proficiency, native English speakers also completed the same cloze test. Native English controls scored from 84-100% accuracy, averaging around 84%. By comparison, scores for L1 Spanish/L2 English speakers ranged from 52-96% correct with an average of 64%.

---

[4] This position has been proposed for both Spanish and Italian, as well as in other languages. To account for facts in Spanish, Zubizarreta (2007) refers to this position as the *phi*-position (where phi stands for nominal person/number features.) In Italian, Cardinaletti (2006) uses the SpecTP position for intervening "weak" or "defective" pronouns that can occur between the *wh*-phrase and the verb, but adopts a separate SubjP position that hosts full DPs, strong pronouns, and certain types of weak pronouns. When these subjects appear before the verb, it is as a result of Left Dislocation.

[5] Due to this exclusion criterion, we were left with 23 remaining participants. Therefore, there were an unequal number of respondents per list.

3.1.2. Materials

We tested a total of 5 different sentence types/conditions (Table 1). A given participant saw five versions of each sentence type over the course of the experiment, but with different lexicalizations (i.e., no one saw the same sentence more than once). In addition to the uninverted main clause questions originally tested by Goodall (2011), labeled as "Main_Uninvert" in Table 1, Sentence Type 3, we also tested a grammatical root interrogative counterpart (Main_Invert; Table 1, Type 2) and a grammatical single-clause declarative sentence (Main_Decl; Table 1, Type 1). We also extended the study to include both inverted and uninverted embedded interrogatives (Embd_Invert, Type 4 and Embd_Uninverted, Type 5). This produced a total of 25 different sentences, which were randomized using a Latin Square design to ensure that each participant saw only one version of each target sentence, and saw each sentence type 5 times.

In addition, participants rated 36 filler sentences of three different types: Double Negation, noun-adjective Ordering, and Case Marking. Fillers were balanced such that participants saw 6 ungrammatical and 6 grammatical sentences of each filler type. The purpose of these filler items was to determine whether any potential effects of satiation we observed could be attributed specifically to the syntactic differences between English and Spanish SVI or whether any observed satiation effect could be attributed to extra-linguistic factors generally (e.g. someone becoming more lenient in the ratings for all kinds of ungrammatical sentences as the experiment progresses). In the latter case, we should find satiation across all experiment items, including the unrelated, but also ungrammatical fillers.

Figure 2 Sample Main_Uninvert target item

Underneath each sentence was a five-point scale ranging from "Completely Unacceptable" to "Completely Acceptable" (Figure 2). Unlike Goodall (2011), we used a 5-point Likert scale rather than a Yes/No forced choice paradigm, so participants could express gradient judgments of acceptability.

3.1.3. Procedure

The grammaticality judgment survey was administered online through Qualtrics (Qualtrics, Provo, UT). In order to facilitate detection of any possible satiation effects, participants were asked to complete the survey using a computer (i.e. no mobile or tablet devices) and to do so in one sitting, without interruptions. Prior to beginning the grammaticality judgment task, participants were instructed to rate how "natural or unnatural" the sentences "intuitively" sounded to them. They were also encouraged to give their "initial reaction to each sentence without trying to remember previous ratings." In addition, participants were given three sample sentences, with variable ratings. Finally, participants were asked to rate a practice sentence before beginning the experiment portion of the survey.

Each sentence in the survey was presented on a separate screen to ensure that participants were not "checking" their previous answers. After the sentence-rating portion of the study, participants were given up to 15 minutes to fill in the blanks of a single cloze passage taken from Oshita (1997; Yin 2012). Participants then answered additional questions regarding their language background, including self-reported ratings of their proficiency, age of English acquisition, years of study, and time spent in an English-speaking country.

Table 1: Example item illustrating conditions in English versus Spanish

Sentence Type	(1) Main_Decl	(2) Main_Invert	(3) Main_Uninvert	(4) Embd_Invert	(5) Embd_Uninvert
English	John will buy an apple at the store.	What will John buy at the store?	What John will buy at the store?	I wonder what will John buy at the store.	I wonder what John will buy at the store.
Grammatical In English?	Yes	Yes	No	No	Yes
Spanish	Juan comprará una manzana en la tienda.	¿Qué comprará Juan en la tienda?	¿Qué Juan comprará en la tienda?	Me pregunto qué comprará Juan en la tienda.	Me pregunto qué Juan comprará en la tienda.
Grammatical In Spanish?	Yes	Yes	No	Yes	No

Table 2: Some example filler items in English versus Spanish

Filler Type	(1a) Double Negation	(1b) Single Negation	(2a) Adjective-Noun Order	(2b) Noun-Adjective Order	(3a) Correct Case Assignment	(3b) Incorrect Case Assignment
English	Paul will not learn nothing.	Paul will learn nothing.	George will pet an orange cat.	George will pet a cat orange.	Victor will promise them an expensive dinner.	Victor will promise they an expensive dinner.
Grammatical In English?	No	Yes	Yes	No	Yes	No
Spanish	Pablo no aprenderá nada.	Pablo aprenderá nada.	Jorge acariciará un naranja gato.	Jorge acariciará un gato naranja.	Victor les prometerá una cena cara.	Victor ellos prometerá una cena cara.
Grammatical In Spanish?	Yes	No	No	Yes	Yes	No

3.2. Predictions
3.2.1. English

Following Goodall (2011), we expect that native English speakers will not show any signs of satiation in any of the sentence types. This means that there should be no difference in English speakers' ratings from the first half to the last half of the study.

3.2.2. L1 Spanish/L2 English

Possibility 1: L1 Spanish/L2 English speakers do not satiate, just like L1 English speakers: If native Spanish speakers are performing comparably to native English speakers and are not transferring the structure of Spanish SVI into English, then we should observe two things. First, there should be little to no difference between the English and Spanish ratings generally. Second, and more importantly, we should expect the effect of satiation to be the same for the native Spanish speakers as it is for the native English speakers. Namely, across all sentence types there should not be a difference in ratings between first and last halves of the study.

Possibility 2: L1 Spanish/L2 English speakers do satiate, unlike L1 English speakers: However, if native Spanish speakers are representing English SVI by mapping the English sentences onto the Spanish structure, we would expect these sentences to behave as they do in *Spanish*. Namely, their ratings during the last half of the study *will* differ significantly from their own *initial* ratings from the first half of the study. Therefore, we predict that average ratings will improve due to satiation because the Spanish structure – even when filled with the English lexicon – licenses it.

Since satiation is an effect that applies to ungrammatical sentences, our two conditions of interest are the two sentence types that are ungrammatical *in Spanish*: Main_Uninvert and Embd_Uninvert. However, there is a crucial asymmetry between the Main_Uninvert and Embd_Uninvert conditions: Unlike the Main_Uninvert sentence types that are ungrammatical in both English and Spanish, the Embd_Uninvert are ungrammatical in Spanish but grammatical in English. As a result, it is not clear whether satiation effects are predicted for this condition, since satiation is by definition a phenomenon that occurs with ungrammatical sentences. Relatedly, the grammaticality of this construction in English may result in ceiling effects, which could mask potential satiation effects. Furthermore, prior work on monolingual Spanish speakers did not test embedded contexts – so, although we would logically expect native Spanish speakers to satiate in embedded contexts in Spanish as well, this has not yet been shown and in fact is an important avenue for future work. For these reasons, the Main_Uninvert condition constitutes our primary condition of interest, and our expectations for Embd_Uninvert type are less clear.

In the fully grammatical baseline conditions – the Main Declarative (Main_Decl) and Main Clause Inverted (Main_Invert) sentences – we do not expect any change for English or Spanish speakers. In fact, given the total grammaticality of these sentences in both English and Spanish, we predict that ratings will be rather high in initial trials and remain equally high throughout the study. Since Embd_Invert sentences are grammatical in Spanish, we do not predict satiation in this condition; we expect only that ratings for this sentence type will be low due to their ungrammaticality in English.

4. Results and Discussion
4.1. Overall Rating Patterns

We will first look at the general patterns of the L1 Spanish/L2 English speakers and compare their performance – satiation aside – to that of the native English speakers. This comparison does not directly test our predictions regarding satiation, but it does provide a view of native Spanish speakers' overall proficiency. In particular, data from ratings collapsed across all trials shows that in the aggregate, native Spanish speakers' ratings were very similar to those from native English speakers. Data from this section may initially suggest native-like competency in English SVI, but data from satiation (Section 4.2) suggests that this conclusion would be incorrect.

4.1.1. Data Analysis

Results were coded such that raw score of 1 represented a "Completely Unacceptable" rating while a raw score of 5 corresponded to a "Completely Acceptable" rating. All data were analyzed using R statistics software (R Core Team, 2013).

Before we look at the critical data about changes over time (Section 4.2), which will allow us to detect the presence/absence of satiation, let us look at the data patterns for the entirety of the experiment. These are shown in Figure 3. In the comparison between the two language groups, we performed two-tailed Welch's t-tests on the raw scores and z-scores in all conditions, comparing the English against the L1 Spanish/L2 English speakers. Raw score ratings are reported in Figure 3.[6]

4.1.2. English and Spanish Overall Ratings

Figure 3: English and Spanish Overall Scores Compared

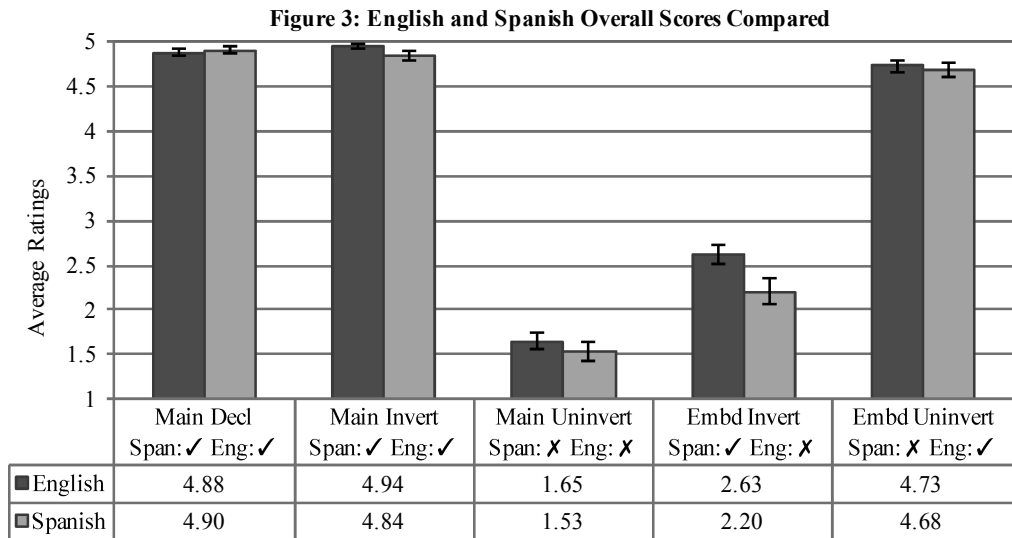|	Main Decl Span: ✓ Eng: ✓	Main Invert Span: ✓ Eng: ✓	Main Uninvert Span: ✗ Eng: ✗	Embd Invert Span: ✓ Eng: ✗	Embd Uninvert Span: ✗ Eng: ✓
■ English	4.88	4.94	1.65	2.63	4.73
□ Spanish	4.90	4.84	1.53	2.20	4.68

Figure 3 shows ratings (on a scale of 1 = "Completely Acceptable" to 5 = "Completely Unacceptable") for all sentence types from English and Spanish speakers. For all charts, error bars represent +/- 1 Standard Error; ✓ represent grammaticality, and ✗ represent ungrammaticality.

In the Main_Decl, Main_Invert, and Embd_Uninvert conditions, ratings for both English and Spanish speakers approached the maximum, '5', and there were no significant differences in the ratings between the two groups (Main_Decl: t1(52.03) = -.52, t2(47.60) = -.64; , Main_Invert: t1(27.43) = 1.48, t2(35.15) = 1.65; and Embd_Uninvert: t1(47.13) = .33, t2(47.8) = .35; in both by-subject and by-items analyses p's > .1).[7] By contrast, ratings for the Main_Uninvert and Embd_Invert conditions were expected to be low because the sentences are ungrammatical in English. Both groups do indeed give them lower ratings, and there are no clear differences between English and Spanish speakers (Main_Uninvert: t1(41.63) = .57, p > .5; t2(47.3) = .56, p > .5; Embd_Invert: t1(42.97) = 1.24; p > .2, Embd_Invert t2(39.63) = 3.16, p < .01).[8]

---

[6] Degrees of Freedom look the way they do because we used Welch's t-tests which do not assume equal variances.
[7] We also conducted statistical analyses on z-scores. For all comparisons, statistically significant effects that were found for the raw scores were also significant for the z-scores.
[8] Though there is a significant by-items (but not by-subjects) effect in the Embd_Invert condition, where English speakers unexpectedly rate the sentences as *better* than Spanish speakers. This may be due to some English speakers using a 'direct speech' construction as an 'escape hatch' to make the sentences grammatical (*I wonder, "What will John buy?"*). See Green (1996) for additional pragmatic factors that can influence acceptability of inversion in embedded American English clauses. Crucially, English speakers' results (Figure 4) show no difference between the first and second halves of the study, again suggesting there has not been any satiation for English speakers.

4.1.3. Discussion of overall scores

Collapsing across all trials, English and Spanish speakers pattern alike and as expected: grammatical sentences received higher ratings while ungrammatical sentences received lower ones. In other words, when we look at the entire study, the L1 Spanish/L2 English speakers pattern like native L1 English speakers. Thus, data from the aggregate scores would seem to suggest that native Spanish speakers are converging towards (or have already attained) a native-like grammar.

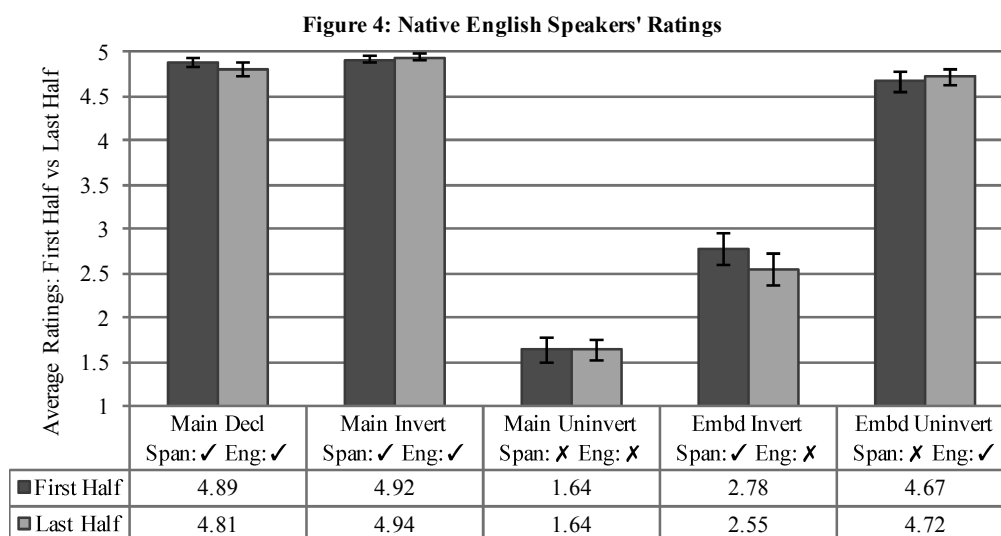### 4.2. Testing for Satiation: First Half – Last Half Comparisons

Next, we turn to the critical satiation data. Though results from the overall scores (Section 4.1), might have suggested that native Spanish speakers were largely native-like in their English L2, a finer-grained view of the data via satiation provides a different picture of acquisition. In particular, the satiation data presented suggests that despite native-like behavior in their overall ratings, Spanish speakers exhibit Spanish-like satiation patterns when judging English sentences. This indicates that they may be transferring their representation of SVI from Spanish to English.

4.2.1. Data analysis

To determine whether there was an effect of satiation, we followed prior work (Goodall 2011; Snyder 2000; Francom 2009; etc.) in comparing the averaged scores from Trials 1 and 2 (First Half) against average scores from Trials 4 and 5 (Last Half). These scores were then compared using a one-tailed, paired t-test. Since variances were not assumed to be equal, the Welch approximation of the degrees of freedom was used. This was done by-subjects for every condition.[9]

4.2.2. Native English Results

As predicted, English speakers' ratings did not change significantly from the first half to the second half in any of the conditions (Main_Decl: $t(31) = .93$; Main_Invert: $t(31) = -.3$; Main_Uninvert: $t(31) = 0$; Embd_Invert: $t(31) = 1.1$; Embd_Uninvert: $t(31) = -0.37$; p's $> .3$ for all conditions). Across all conditions, English speakers were stable, rating the sentences similarly from the first half (Trials 1 and 2) to the last half (Trial 4 and 5). In other words, L1 English speakers show no satiation effects.
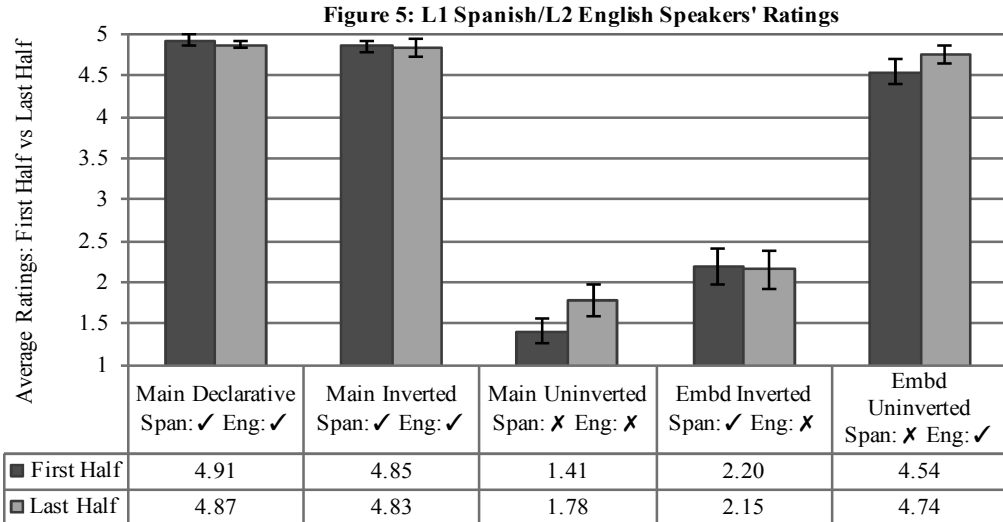

Figure 4: Native English Speakers' Ratings

	Main Decl Span:✓ Eng:✓	Main Invert Span:✓ Eng:✓	Main Uninvert Span:✗ Eng:✗	Embd Invert Span:✓ Eng:✗	Embd Uninvert Span:✗ Eng:✓
■ First Half	4.89	4.92	1.64	2.78	4.67
▨ Last Half	4.81	4.94	1.64	2.55	4.72

---

[9] Because each block of 5 trials constituted a single measure, we could not perform by-items t-tests. Only by-subjects t-tests were performed.

4.2.3. Monolingual English Discussion

We compared English speakers' average ratings from the first half of the study against the ratings from the last half of the study. There were no changes in English speakers' ratings in any conditions, indicating that there was no satiation, even in contexts not tested by Goodall (2011). We take this as indication that whatever is responsible for SVI in English (e.g. I-to-C movement) is not a grammatical process that can be affected by repeated exposure.

4.2.4. L1 Spanish/L2 English Results

Figure 5: L1 Spanish/L2 English Speakers' Ratings

	Main Declarative Span: ✓ Eng: ✓	Main Inverted Span: ✓ Eng: ✓	Main Uninverted Span: ✗ Eng: ✗	Embd Inverted Span: ✓ Eng: ✗	Embd Uninverted Span: ✗ Eng: ✓
■ First Half	4.91	4.85	1.41	2.20	4.54
▢ Last Half	4.87	4.83	1.78	2.15	4.74

Recall that the Main_Uninvert condition is the critical condition of interest. As can be seen in Figure 5, ratings for the Main_Uninvert sentences improved significantly between the first half and the last half of the study ($t(22) = -2.17$; $p = .02$). In other words, Spanish speakers did show significant satiation effects over the course of the study in the Main_Uninv condition.

We were also curious about the possibility of satiation in the Embd_Uninvert condition, because these sentences are also ungrammatical in Spanish. However, as discussed in Section 3.2.2, our predictions for this condition were less clear due to a number of reasons, including the fact that the sentences are grammatical in English. As can be seen in Figure 5, there is a numerical improvement in the ratings in this condition over the course of the experiment – i.e., the pattern goes in the right direction, but it does not reach significance ($t(22) = -1.23$; $p = .12$).

There were no other significant differences in any of the other conditions (Main_Decl: $t(22) = .49$; Main_Invert: $t(22) = .18$, and Embd_Invert: $t(22) = .26$; p's $> .5$ in all cases).

4.2.5. L1 Spanish/L2 English Discussion

Satiation in Main_Uninvert condition: We predicted that if Spanish speakers were transferring their L1 Spanish representation of SVI into English, then ratings in the Main_Uninvert and Embd_Uninvert conditions would improve – or satiate – over the course of the study. Indeed, we find that sentences in the Main_Uninvert condition showed evidence of transfer from Spanish to English: average ratings improved from the first half to the last half of the study, indicating that there was satiation. More specifically, the fact that the Main_Uninvert sentences underwent satiation suggests that native Spanish speakers were using the structure from their L1 Spanish to represent the English sentences.[10]

---

[10] To assess the potential relationship between level of English proficiency and the degree of satiation, Pearson's Correlation Coefficient was calculated and subsequently tested for significance using a two-tailed test. Ultimately, we found no significant correlation between degree of satiation and proficiency in English ($r(44) = .05$, p (two-tailed) $> .7$). We believe this is likely because participants were all of relatively high English proficiency.

No significant effects in Embd_Uninvert condition: Recall from Section 3.2.2 that this is the condition where predictions regarding satiation are unclear because Embd_Uninvert sentences are ungrammatical in Spanish but grammatical in English (unlike, for instance, Main_Uninvert sentences which are ungrammatical in both English and Spanish). Our results show that participants' scores do indeed *increase* (4.54 in the first half versus 4.74 in the last half) over the course of the experiment, showing hints of satiation. However, since this effect is not statistically significant, we should be careful not to (over-)interpret results in this condition.

5. General Discussion

Using the phenomenon of SVI and the method of syntactic satiation, we sought to clarify how L2 learners would represent syntactic structures that might seem superficially similar, but are underlyingly different. In particular, we asked whether native Spanish speakers could represent SVI as English speakers do or whether their representation of Inversion would be transferred from Spanish to English. We predicted that an 'English-like' representation of SVI would be characterized by sentence judgments that did not satiate; in other words, ratings for ungrammatical sentences would not improve with more exposure. By contrast, we expected that a representation of SVI that was transferred from Spanish would be accompanied by rating satiation (improvement over exposures) for ungrammatical sentences, as shown by Goodall (2011) for monolingual Spanish speakers in Spanish.

Our results show that in the aggregate, there are very small differences between the L1 Spanish/L2 English and native English groups: grammaticality ratings patterned in the same way. If we had only looked at results alone (Sections 4.1.2 - 4.1.3), we might have concluded that the Spanish speakers show native-like performance in their second language. However, a closer look at changes in Spanish speakers' ratings over many exposures shows subtle (though significant) differences in ratings that reflect differences in Spanish speakers' representations of English SVI. In particular, L1 Spanish/L2 English speakers' ratings for the Main_Uninvert sentences improved with exposure (satiated), but ratings from native English speakers did not. This indicated that even proficient Spanish speakers whose overall judgments did not differ from those of English speakers, represented English inversion as a variant of Spanish inversion via transfer.

Could there be an alternative explanation for the increased ratings that we observe in L1 Spanish/L2 English speakers in the Main_Uninvert and Embd_Uninvert conditions? One possible concern might be that Spanish speakers' ratings underwent satiation, not necessarily because of transfer from Spanish, but because of non-linguistic factors (e.g. pressure to update grammatical representations over many exposures, increased processing load for learners, lower confidence/tentativeness in their initial ratings, etc). While the satiation effects we observed could be due to extra-grammatical factors, we do not believe this is likely because satiation was only found where predicted and more importantly, do not extend to any of the ungrammatical fillers in the study.

Recall that we included three filler types (see Table 2) with 6 grammatical and 6 ungrammatical sentences each. These were included to allow us to test whether Spanish speakers' ratings were improving across the board – and therefore, to test the possibility that what we attributed to satiation was actually due to extra-linguistic factors. If the rating improvements occurred even for these unrelated, ungrammatical fillers, that would be evidence against our satiation account. If, however, the rating improvements were limited to the predicted sentence types, then it would be difficult to attribute the cause of satiation to something language-external. Thus, we compared ratings for the ungrammatical fillers using the same criteria as in the targets. Specifically, we averaged the ratings from Trials 1 and 2 (i.e. first half) and compared them against the average ratings for Trials 4 and 5 (i.e. last half).[11] Crucially, we found no significant differences for any of the filler types that are ungrammatical in Spanish (Single Negation: $t(22) = -1.21$; adjective-noun Order: $t(22) = -.24$; Incorrect Case $t(2) = 1.86$; in all cases, $p > .1$). This indicated, therefore, that satiation was not a property of second language acquisition or extra-linguistic factors generally and was more likely a property of the way that Spanish speakers represent SVI.

---

[11] Note that for each of the filler types, participants saw 6 ungrammatical and 6 grammatical trials whereas participants only saw each condition for the target sentences 5 times. In order to maximize comparability, we compared Trials 1 and 2 against Trials 4 and 5, essentially disregarding the 6th trial for the fillers.

Our results showed that even though native Spanish speakers' *judgments* of SVI in English appeared native-like, their *representations* – and by extension, how they got to those judgments – might ultimately not have been native-like. Given that native English and Spanish speakers did show significant differences in how their ratings changed after more exposures but still did not differ in their overall ratings, it seems that learners can get quite a bit of "mileage" even when the underlying syntactic structure is not one that is completely native-like.

Prior research has already shown that a "good-enough" style of processing is a strategy that is readily used by native speakers (Ferreira et al 2002; Slattery et al. 2013; Kharkwal and Stromswold 2014; etc.). Moreover, "good enough" processing has similarly been proposed in other domains of syntax acquisition (Felser 2012; Cunnings and Felser 2013; Felser and Roberts 2007; Marinis 2005; etc.) and, has even been independently proposed for acquisition of SVI albeit for native *English* speakers acquiring *Spanish* SVI (Frank 2013). If *under*specification can suffice in first and second language processing languages, then perhaps, *imprecise* specifications (e.g. via transfer) can also suffice for everyday second language processing. The issue, perhaps, is not necessarily whether second language learners are capable of building new syntactic representations, but whether there is an outstanding need to do so that an under- or imprecisely- specified structure cannot capture.

6. Conclusion

We compared native English and native Spanish speakers' judgments of SVI in English interrogatives, a construction that appears to be superficially similar in English and Spanish but is nonetheless difficult for second language learners of English. Using the phenomenon of satiation, a measure that is new to second language research, we found evidence of syntactic transfer from L1 Spanish to L2 English even among very proficient learners of English who, in the aggregate, seemingly did not differ from native speakers. Crucially, this distinction was contingent on (a) adopting an account of SVI that did not unify English and Spanish as the same underlying syntactic construction and (b) using satiation to uncover fine-grained changes in Spanish speakers' judgments otherwise missed by overall rating comparisons. Future research is required to gain a better understanding of what underlies the main clause vs. embedded clause contrasts found in this study.

References

Barbosa, Pilar. (2001). On inversion in wh-questions in Romance. In Hulk Aafke, Pollock Jean-Yves. (Eds.), *Subject inversion in Romance and the theory of universal grammar* (pp. 20–59). Oxford, UK: Oxford University Press.

Braze, David F. (2002). Grammaticality, acceptability, and sentence processing: A psycholinguistic study. Ph.D. dissertation, University of Connecticut, Storrs.

Cabrera, Monica, & Mejia, Yolanda. (2008). El orden de palabras en las preguntas qu- en español e inglés como segundas lenguas. In Actas del XV Congreso Internacional de la Asociación de Lingüística y Filología de América Latina. Montevideo, Uruguay: ALFAL.

Cardinaletti, Anna. (2006). Subjects and Wh-questions: Some New Generalizations. In José Camacho et al. (Eds.), The Best Romance: Selected Papers from the 36th Linguistic Symposium on Romance Languages (LSRL), New Brunswick. (pp. 57-78). Amsterdam & Philadelphia: John Benjamins.

Cunnings, Ian. & Felser, Claudia. (2013). The role of working memory in the processing of reflexives. *Language and Cognitive Processes*, 28 (1-2). pp. 188-219.

Cuza, Alejandro. (2013). Cross-linguistic influence at the syntax proper: interrogative subject-verb inversion in heritage Spanish. *The International Journal of Bilingualism, 17*(1), 71-96.

Cuza, Alejandro, & Frank, Joshua. (2011). Transfer Effects at the Syntax-Semantics Interface: The Case of Double-que Questions in Heritage Spanish. *Heritage Language Journal*, 8(1), 66-89.

Felser, Claudia, Cunnings, Ian, Batterham, Claire, & Clahsen, Harald. (2012). The timing of island effects in nonnative sentence processing. *Studies in Second Language Acquisition* 34(1), 67-98.

Felser, Claudia. & Roberts, Leah. (2007). Processing wh-dependencies in a second language: A cross-modal priming study. Second Language Research 23, 9-36.

Ferreira, Fernanda, Bailey, Karl G.D., Ferraro, Vittoria. (2002) Good enough representations in language comprehension. *Current Directions in Psychological Science*, 11(1), 11-15.

Frank, Joshua. (2013). "Good enough" representation in L2 Spanish and English wh-questions. Presented at the 43rd Linguistics Symposium on Romance Languages (LSRL). City University of New York (CUNY). New York, NY.

Gass, Susan & Ard, Josh. (1984). Second language acquisition and the ontology of language universals. In William E. Rutherford (Ed.) *Language Universals and Second Language Acquisition*, Amsterdam: John Benjamins.

Goodall, Grant. (2004). On the syntax and processing of wh-questions in Spanish. In Vineeta Chand et al. (Eds.) Proceedings of West Coast Conference on Formal Linguistics 23, (pp. 237–250). Somerville, MA: Cascadilla Press.

Goodall, Grant. (2011), Syntactic Satiation and the Inversion Effect in English and Spanish Wh-Questions. *Syntax*, 14(1), 29–47.

Green, Georgia M. (1996). Pragmatics and natural language understanding. Mahwah, NJ: Erlbaum.

Hiramatsu, Kazuko. (2000). Accessing linguistic competence: Evidence from children's and adults' acceptability judgments. Ph.D. dissertation, University of Connecticut, Storrs.

Kharkwal, Gaurav. & Stormswold, Karin. (2014). Good-Enough Language Processing: Evidence from Sentence-Video Matching. *Journal of Psycholinguistic Research*, 43(1), 27-43

Labov, William, Cohen, Paul, Robins, Clarence, & Lewis, John. (1968). A study of the non-standard English of Negro and Puerto Rican Speakers in New York City. New York, NY: Columbia University.

Marinis, Theodore, Roberts, Leah, Felser, Claudia, & Clahsen, Harald. (2005). Gaps in second language sentence processing. *Studies in Second Language Acquisition*, 27(1), 53-78.

Montrul, Silvina A. (2004). The Acquisition of Spanish: Morphosyntactic development in monolingual and bilingual L1 acquisition and adult L2 acquisition. Series on Language Acquisition and Language Disorders, 37. Amsterdam: John Benjamins.

Ordóñez, Francisco & Olarrea, Antxon. (2006). Microvariation in Caribbean/non-Caribbean Spanish interrogatives. *Probus*, 18(1), 59–96.

Oshita, Hiroyuki. (1997). The unaccusative trap: L2 acquisition of English intransitive verbs. Unpublished doctoral dissertation, University of Southern California.

Parodi, Teresa, Schwartz, Bonnie D. & Clahsen, Harald. (2004). On the L2 acquisition of the morphosyntax of German nominals. *Linguistics*, 42(3), 669-705.

Pesetsky, David. and Torrego, Esther. (2001). T-to-C movement: Causes and consequences. In Michael Kenstowicz (Ed.), Ken Hale: A life in language (pp. 355–418). Cambridge, MA: MIT Press.

Pozzan, Lucia. & Quirk, Erin. (2014). Second language acquisition of English questions: An elicited production study. *Applied Psycholinguistics*, 35, 1055-1086.

Qualtrics Software, Version 37,892 of the Qualtrics Research Suite. Copyright © 2013 Qualtrics. Qualtrics and all other Qualtrics product or service names are registered trademarks or trademarks of Qualtrics, Provo, UT, USA. http://www.qualtrics.com

R Core Team (2013). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. http://www.R-project.org/.

Rizzi, Luigi. (1996). Residual verb second and the wh-criterion. In Adriana Belletti and Luigi Rizzi (Eds.), *Parameters and functional heads* (pp. 63–90). Oxford, UK: Oxford University Press.

Sánchez, Liliana. (2002). Spell-out conditions for interpretable features in L1 and L2/bilingual Spanish. In Ana Teresa Pérez-Leroux and Juana Muñoz Liceras (Eds.), *The Acquisition of Spanish Morphosyntax,* (pp. 89–114). Dordrecht: Kluwer.

Slattery, Timothy J., Sturt, Patrick, Christianson, Kiel, Yoshida, Masaya, & Ferreira, Fernanda. (2013). Lingering Misinterpretations of garden path sentences arise from competing syntactic representations. *Journal of Memory and Language*, 69(2), 104-120.

Snyder, William. (2000). An experimental investigation of syntactic satiation effects. *Linguistic Inquiry* 31(3), 575–582.

Stringer, David. (2015). Embedded Wh-Questions in L2 English in India. *Studies in Second Language Acquisition* 37(1), 101-133.

Suñer, Margarita. (1994). V-movement and the licensing of argumental wh-phrases in Spanish. *Natural Language & Linguistic Theory* 12(2), 335–372.

Torrego, Esther. (1984). On inversion in Spanish and some of its effects. *Linguistic Inquiry*, 15(1), 103–129.

White, Lydia. (1985) The "pro-drop" parameter in adult second language learning. *Language Learning* 35, 47-62.

White, Lydia, Valenzuela, Elena, Kozlowska-Macgregor, Martyna, & Leung, Yan-kit I. (2004). Gender agreement in nonnative Spanish. *Applied Psycholinguistics* 25(1), 105-133

Yin, Bin. (2012). Investigating Chinese Speakers' Acquisition of Telicity in English. Ph.D. dissertation, University of Southern California.

Zagona, Karen. (2002). *The Syntax of Spanish*. Cambridge: Cambridge University Press.

Zubizarreta, Maria Luisa. (1998) Prosody, Focus, and Word Order. *Linguistic Inquiry* Monograph 33, MIT Press.

Zubizarreta, Maria Luisa. (2007). The Left Edge in the Spanish Clausal Structure. In Pascual José Masullo et al. (Eds.) Proceedings of 37th Linguistic Symposium in Romance Languages. (pp. 339-357). Amsterdam: John Benjamins.

Proceedings of the 13th Generative Approaches to Second Language Acquisition Conference (GASLA 2015)

edited by David Stringer, Jordan Garrett, Becky Halloran, and Sabrina Mossman

Cascadilla Proceedings Project   Somerville, MA   2016

Web access and citation information

This entire proceedings can also be viewed on the web at www.lingref.com. Each paper has a unique document # which can be added to citations to facilitate access. The document # should not replace the full citation.

This paper can be cited as:

Do, Monica, Elsi Kaiser, and Maria Luisa Zubizarreta. 2016. Spanish Speakers' Acquisition of English Subject-Verb Inversion: Evidence from Satiation. In *Proceedings of the 13th Generative Approaches to Second Language Acquisition Conference (GASLA 2015)*, ed. David Stringer et al., 45-59. Somerville, MA: Cascadilla Proceedings Project. www.lingref.com, document #3274.