

SENTENCE PROCESSING IN SPANISH BILINGUALS: EXPLORING ADJECTIVAL
INTERPRETATIONS

By

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To my family, for their love and support

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LIST OF ABBREVIATIONS

AN	adjective noun, pre-nominal adjective placement, non-canonical word ordering
DP/DPs	determiner phrase, the phrase including the determiner, adjective, and noun
FA/FAs	Full Access account(s)
gram.	grammatical
NA	noun adjective, post-nominal adjective placement, canonical word ordering
NumP	number phrase
RDA/RDAs	Representational Deficit account(s)
ungram.	ungrammatical
UG	Universal Grammar
WMP	word marker phrase

Abstract of Thesis Presented to the Graduate School
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Sentence level processing in non-native speakers of Spanish has been a widely studied topic in the field of second language acquisition. This paper attempts to add evidence to a recent area of study that utilizes both off-line and on-line tasks to compare native speakers and second language learners, in order to build evidence in favor of either accounts of representational deficits, or full access accounts. Participants (n=36) of varying levels of Spanish were tested using an adjectival manipulation that has both semantic and syntactic entailments, as first seen in Rothman et al. 2010¹. This previous study found that higher proficiency intermediate level learners of Spanish could attain native-like linguistic competence in the feature tested, and this evidence did not support accounts of representational deficits. In the present study, we implemented one of the same off-line tasks used previously, and added an on-line self-paced reading task. This would allow for us to compare both explicit and implicit knowledge of the manipulation in question. We used the same adjectival manipulation, which had very subtle shifts in

¹ Rothman, J., Judy, T., Guijarro-Fuentes, P., & Pires, A. (2010). ON THE (UN)-AMBIGUITY OF ADJECTIVAL MODIFICATION IN SPANISH DETERMINER PHRASES informing debates on the mental representations of L2 syntax. *Studies in Second Language Acquisition*, 32(1), 47-77.

meaning between pre and post-nominal adjective placement, as well as a special set of adjectives that had very strong changes in meaning when placed either before or after the noun in the determiner phrase. We found that natives and learners showed no statistical differences in either the on-line or off-line tasks to either the experimental adjectives or the meaning changing adjectives, though neither group demonstrated any sensitivity to either type of adjective type tested. Instead the participants showed sensitivity only to the conditions containing non-canonical word ordering, where the adjective appeared first in the DP. We rejected accounts of representational deficits, but only tentatively favored accounts of full access.

CHAPTER 1 INTRODUCTION

A central debate in the study of second language acquisition is the question of how learners of a second language differ from native speakers of the same language. The way a child learns his first language and the way a teen or adult acquires an additional language is not surprisingly very different. In turn, the question is frequently raised as to how these different paths of acquisition affect the way these disparate individuals process the language in question. We know that there are many observable differences in the grammars of L1 and L2 speakers. These have been referred to as optionality, variability, fossilization, among others. Here, we will explore two different accounts that attempted to explain the variances between L1 and L2 grammars: accounts of representational deficits, and generative accounts such as Full Access. Representational deficit accounts, in general, state that second language grammars are lacking in some sense. The shallow structures hypothesis (Clahsen and Felser, 2006), for example, suggests that L2 grammars are less detailed than those of native speakers. In opposition, other researchers take a more generative approach to second language acquisition, suggesting that both L1 and L2 learners have the same inherent ability to acquire a language, as guided by the principles of Universal Grammar. In particular, we look at accounts of Full Access, which say that learners are able to tap into UG like children learning a second language.

The study reported in this thesis is a continuation of Rothman, Judy, Guijarro-Fuentes, and Pires (2010) that tested native Spanish speakers versus native English speaking learners of Spanish. Using an adjectival placement manipulation, these researchers conducted two off-line experiments. These tasks looked at the differences

in semantic meaning, which vary between post-nominal adjectival placement (canonical) and pre-nominal adjective placement, as forced by preceding contexts. Rothman et al. found that advanced learners of Spanish were able to converge on native-like processing abilities, and thus concluded that no evidence for accounts of representational deficits was present. In the present study, we intend to use the same adjectival manipulation mentioned above (to be discussed in greater detail below), while having both off-line and on-line tasks for the participants to complete. Should our results confirm those of the previous study, it would lend strong evidence, both off-line and in real time, that learners of a second language are capable of acquiring native-like processing abilities, and that their underlying grammar is not deficient or incomplete.

The paper will proceed with an overview of relevant research on this topic (Chapter 2), followed by a run through of the methodology and goals of the experiments (Chapter 3 and 4), and will close with an overview of the results, a discussion of the results and final conclusions based on the theoretical framework laid out below (Chapter 5, 6, and 7).

CHAPTER 2 BACKGROUND

Accounts of Second Language Processing

Accounts of representational deficits posit, as the name would suggest, that L2 learners have mental representations that are in some way deficient as compared to native speakers. This assumes that learners of a second language are not capable of reaching a native-like ability in their L2. One popular account that falls under this category is the Shallow Structures hypothesis (Clahsen and Felser, 2006). In this model, L2 learners have representations during processing that contain less detail than native speakers. In other words, the processing is less profound. This means that learners rely on more superficial cues to process a phrase, as opposed to deeper syntactic structures. For example, a learner attempting to use the past tense might rely on adverbs like “yesterday” in place of past tense conjugation. This is similar to Ullman’s Declarative/Procedural model (2004), which posits a declarative and a procedural memory system, in that L2 learners will process lexical items easier than underlying syntactic rules or grammar. The reliance on declarative systems is akin to the reliance on shallow, superficial aspects of language. Shallow processing, like Ullman’s model, is not limited to L2 learners. “Good enough” processing, coined by Ferreira, Bailey, and Ferraro (2002), is the idea that even native speakers only partially process most sentences, as evidenced by studies on garden path sentences and passives. The difference between the L1 and L2 speakers is that L1 speakers have the native underlying representations, which L2 learners lack, even though the structure of the processing system is similar.

Two other accounts of representational deficits include the Failed Functional Features Hypothesis (FFFH)(Hawkins and Chan, 1997) and the Interpretability Hypothesis (IH)(Tsimpli and Mastropavlou, 2007). The FFFH proposes a declining access to functional categories after a certain critical period. This theory claims that the learner has some access to Universal Grammar, but interference from the L1 results in the inability to instantiate features of functional categories that differ from their primary language. These difficulties suggest that the problems are of a syntactic nature.

Tsimpli and Roussou, in their 1991 paper, state that the parameters with the settings as specified by the L1 resist being reset, and that this is due to maturational effects. Thus parameter settings become resistant to change sometime during childhood, or around the time the L1 has been fully acquired. Tsimpli and Mastropavlou also argue that differences between the L1 and L2 arise from issues within the narrow syntax of the L2. Their Interpretability Hypothesis, which is seen as an updated version of the FFFH, differs in that it distinguishes interpretable and uninterpretable features. Delving into the breakdown between the Logical Form (LF) and the Phonetic Form (PF), as specified by the Minimalist Program, those features that have PF but no LF become uninterpretable to L2 speakers. This would include those features not instantiated in the L1. These features are also sensitive to a critical period, like the FFFH claims, and constrained by the L1. What these hypotheses and theories have in common, is that they predict a learner will only be able to achieve a less profound, surface level understanding of the L2, which is syntactically constrained by the learner's primary language. If UG is accessible even partially, this accessibility fades with time, and the learners are left unable to overcome the parametric obstacles set in place by their L1. L1 and L2

speakers then are not faced with a different process of learning the new language, but rather lose access to the superset of features available and have to contend with existing knowledge that competes with the new input. Native-like acquisition is ultimately unattainable, according to these accounts of representational deficits.

In opposition to accounts of representational deficits, Full Access (FA) models posit complete accessibility to UG in adult second language learners. The Full Transfer/Full Access model (Schwartz and Sprouse, 1994, 1996) predicts that L2 speakers have full transfer of their L1 as the initial state of the L2, with exceptions of specific lexical items. Input from the L2 forces realizations of parsing failures, and the predicted access to UG then allows the learners to reset the necessary parameters to those of the L2. In this model, UG is not susceptible to maturational effects, and access does not wane. Access to UG also explains why poverty-of-the-stimulus properties, which are properties that L2 speakers acquire without explicit input, can be learned by second language learners. Learners are not said to be completely constrained by the parameters set in the primary language, and the L1 is usually not affected by the L2. White (1985b, 1986) demonstrated both the transfer and access of FT/FA using the classic example of the null-subject parameter with native Spanish (null subject) and French (non null-subject) speaking learners of English. The studies showed that the parameter setting in the L1 did affect the participant's grammaticality judgment in English, with the Spanish speakers (whose L1 differed in parameter setting compared to the L2 English) performing worse, thus supporting the claims for full transfer and full access.

There are several different variants of the FT/FA model. Of interest here is the Full Access Hypothesis, which challenges the idea that full transfer of the L1 is the initial state of the L2 (Epstein et al., 1996; Flynn, 1996; Flynn & Martohardjono, 1994). Though this hypothesis rejects L1 transfer, it does not rule out the possibility of the L1 having effects on the second language. White (2003) insists that without L1 transfer, Epstein's model implies that the initial state of the L2 must be UG, like that of a child learning their first language, though this is not implicitly stated. The role of the L1 in this account is not completely clear. The full access mentioned above still applies in this account, meaning that L2 speakers are still UG-constrained like L1 speakers. Both the FT/FA and FA, in contrast to accounts of representational deficits, predict the ability of learners to converge on native-like abilities in the second language. Any notable differences, or optionality, might be attributed to individual variation in speakers or general performance factors as opposed to underlying representational discrepancies.

The comparison of the two sets of account is summarized here:

Role of L1:

- Representational Deficit accounts: The L1 is an insurmountable obstacle in learning the L2. Features that are either not instantiated, or are instantiated differently in the L1 will resist resetting in the L2.
- Full Access accounts: The L1 is either fully transferred as the initial state of the L2 and is gradually reset with input from the L2 (without affecting the state of the L1, or does not transfer, though interference from the L1 can be overcome).

Role of UG:

- RDAs: No access to UG, or partial access, which has a critical period.
- FAs: Full access to UG throughout L2 acquisition that does not diminish with maturational effects.

Ultimate attainment of L2:

- RDAs: L2 speakers have incomplete representations and cannot achieve native-like ability in the second language.
- FAs: L2 speakers should be able to reach the same linguistic competence as native speakers.

A Continuation of Rothman et al. (2010)

The basis of the present study is a continuation of Rothman, Judy, Guijarro-Fuentes, and Pires (2010). Rothman et al. investigated the intersection of syntax and semantics in first and second language learners of Spanish by using two off-line tasks: a semantic interpretation task and a context-based collocation task. 45 English-speaking learners of Spanish (21 intermediate, 24 advanced) and 15 native Spanish speakers participated in the experiment. The study used a manipulation of adjectival placement in Spanish, which has subtle meaning changes when the adjective occurs pre or post-nominally. The canonical word order in Spanish is to place the adjective after the noun, unlike English. This post-nominal placement tells the reader that the adjective refers to a small subset of the noun it modifies. When the adjective occurs pre-nominally, the subset reading is no longer available. Pre-nominally, the adjective refers to the noun as a whole, as though it is a general characteristic of the noun. The difference between the two is very fine. Note below (Figure 2-1):

1a. Post-nominal normal

<i>Las</i>	<i>chicas</i>	<i>bonitas</i>
The (D, pl, fem)	girls (N, pl, fem)	pretty (A, pl, fem)
“The girls that are pretty” (as opposed to the unattractive ones)		

1b. Pre-nominal normal

<i>Las</i>	<i>bonitas</i>	<i>chicas</i>
The (D, pl, fem)	pretty (A, pl, fem)	girls (N, pl, fem)
“The pretty girls” (pretty is a characteristic of girls in general)		

Figure 2-1. Experimental adjective semantics

Many adjectives in Spanish work in this way, but not all. Though not used in the Rothman et al. study, an additional group of special adjectives will be used in the present study. We refer to these as meaning changing adjectives. Whereas the target adjectives have a subtle change in meaning pre and post-nominally, the meaning changing adjectives have an entirely different meaning in the two adjectival placements (thus the name). We have included these in the present study because the semantic change should be much more salient to all levels of proficiency. If we find none of our anticipated results in the experimental items, we hope that we will see clear patterns in these meaning changers. Only a small group of adjectives share this meaning changing property. It should also be noted that this type of adjective and its semantic properties is a topic that is explicitly discussed in second language classrooms, where the other type of adjective is not talked about. Below is an example (Figure 2-2):

2a. Post-nominal meaning changing

El *amigo* *viejo*
The (D, sg, masc) friend (N, sg, masc) old (A, sg, masc)
“The friend that is old” (in age)

2b. Pre-nominal meaning changing

El *viejo* *amigo*
The (D, sg, masc) old (A, sg, masc) friend (N, sg, masc)
“The longtime friend”

Figure 2-2. Meaning changing adjective semantics

We have given much focus to the semantic entailments of the position of the adjective, and we should also touch on the underlying syntax. Following Bernstein (2001), Rothman proposes the Word Marker Phrase (WMP), which precedes the noun phrase, thus coming in between the determiner and the noun itself. The number phrase

intervenes between the determiner and noun, where it also precedes the WMP. In romance languages like Spanish, the head noun obligatorily must raise to the head of the WMP, and then to the number phrase in order to check gender and number features. The two word orders emerge from whether the adjective originates as an adjunct to the NP or the NumP. In interpretation 3a (see below), the pre-nominal adjective reading will always emerge. In interpretation 3b though, the movement of the noun will cause the noun to move before the adjective, and result in the canonical order. Since English does not have a WMP, there is no obligatory noun-raising. Thus, regardless of whether the adjective originates as an adjunct to the NP or the NumP, the noun will never move ahead of it. An adjective occurring pre-nominally has scope over the noun it modifies, thus the interpretation that the adjective is describing the noun as a whole falls out. In the post-nominal position, the noun has scope over the adjective.

See example below (Figure 2-3):

3a. valientes incas “brave Incas”
(generally brave)

3b. incas valientes “brave Incas”
(as opposed to cowardly)

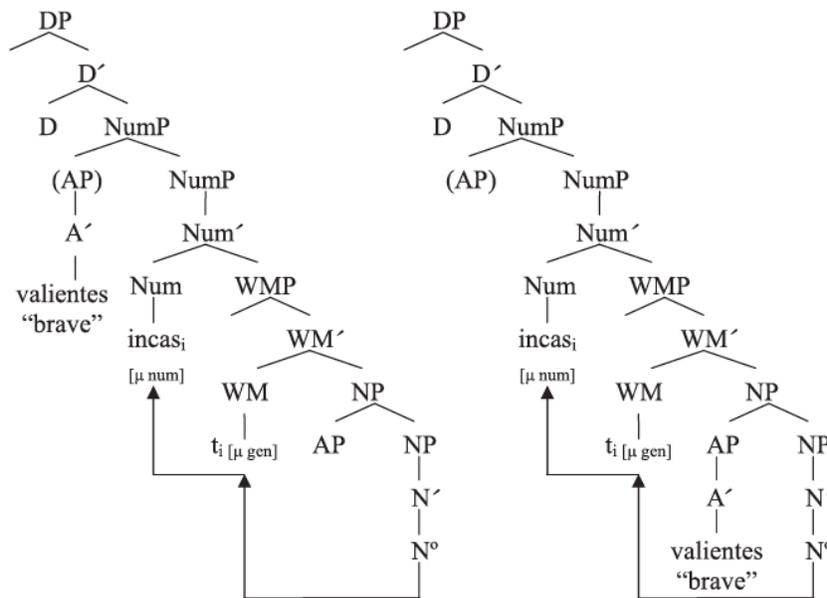


Figure 2-3. Syntax of adjectival movement

Reprinted by permission from Rothman et. al. 2010. On the (Un)-Ambiguity of Adjectival Modification in Spanish Determiner Phrases: informing debates on the mental representations of L2 syntax. (Page 54). *Studies in Second Language Acquisition*.

In the Rothman et al. experiment, participants completed two off-line tasks, mentioned quickly above: a semantic interpretation task and a context based collocation task. Below are examples of both (Figure 2-4). The semantic interpretation task asks participants to read a sentence in Spanish, and select the correct English interpretation. The collocation task asks the participants to place the adjective in question (bolded between parenthesis) either before or after the noun according to the context presented in the surrounding sentence.

***Los valientes incas** resistieron a los conquistadores.*

“The brave Incas held off the invaders.”

Only the brave Incas (i.e., not the cowardly ones) resisted the conquerors.

The Incas, who are all brave, resisted the conquerors.

A. Page 15 (7)

*Entre los alumnos, siempre hay un equilibrio de inteligencia y estupidez en una escuela. Los _____ estudiantes _____ siempre están en las clases de ‘honor.’ (**estudioso**)*

“There is always a balance of intelligence and stupidity in every school. The studious students are always in the honor classes.”

B. Page 16 (10)

Figure 2-4. Off-line tasks from Rothman (2010) A) Semantic Interpretation Task. B) Context Based Collocation Task.

Reprinted by permission from Rothman et. al. 2010. On the (Un)-Ambiguity of Adjectival Modification in Spanish Determiner Phrases: informing debates on the mental representations of L2 syntax. (A: Page 62, Example 7; B: Page 63, Example 10). *Studies in Second Language Acquisition*.

Results from Rothman et al. indicate that native speakers of Spanish and the advanced learners of Spanish performed equivalently on the tasks. As a whole

intermediate speakers did not perform natively, but on further inspection, it was found that if the group of intermediates were divided into two groups based on proficiency, the more advanced intermediate speakers did converge on native-like performance, where the low level intermediate speakers did not. Rothman et al. concluded that it was possible for second language learners to acquire the syntactic properties of Spanish determiner phrases with the appropriate semantic fall out. This evidence does not support accounts claiming representational deficits in second language learners, since the most advanced participants did seem to have acquired native-like linguistic competence in Spanish.

The main departure of the current study from Rothman et al. is the incorporation of on-line testing. A strong majority of the existing research focuses on data taken from off-line behavioral experiments. Those who do compare second language learners to native speakers with both off-line and on-line tests tend to use ERP techniques (Gabriele, Fiorentino, and Alemán Bañón, in press; Alemán Bañón, Fiorentino, and Gabriele, 2012), eye-tracking (Grüter, Lew-Williams, and Fernald, 2012) or are investigating representational deficits in comparison to computational effects (Hopp, 2009) using different hypotheses, such as the Interface Hypothesis (Sorace and Filiaci, 2005). To our knowledge, little work has been done to compare generative accounts to those or representational deficits in both and on-line and off-line fashion. This is an emerging field in the study of second language processing, and thus relatively fewer studies have been completed at this time. Thus, this is an appropriate area to contribute research to.

CHAPTER 3 THE CURRENT STUDY

The current study will explore the relationship between second language learners of Spanish and native Spanish speakers in terms of their sentence level processing. We hope to contribute to the current research which attempts to learn if second language learners can acquire new syntactic structures that will be processed like that of native speakers and have the same underlying configuration. If we find that there are differences between L1 and L2 speakers and/or differences between the outcomes of the on-line and off-line tasks, our results could fall under one of two possible camps of second language processing theory: representational deficit accounts or full access accounts.

As previously stated, this study is meant to be a continuation of Rothman et al.'s 2010 work. The current study will utilize the same adjectival manipulation mentioned above to compare the processing strategies of native speakers of Spanish and native English speaking learners of Spanish of various, higher levels of proficiency. Where this study differs is that it will utilize both off-line and on-line tasks with a self-paced reading task and two off-line semantic judgment tasks. If we are able to replicate the results from the previous study, we would expect to find that native speakers perform very well on both the on-line and off-line tasks, whereas (especially lower proficiency) learners make statistically more errors on one or both of the tasks. The heritage speakers tested here are expected to perform equivalently to the native speakers. We would expect more errors to occur on the self-paced reading task than in either of the off-line tasks, due to the fact that on-line tasks are generally more taxing than off-line tasks. Our off-line tests explicitly ask for a semantic judgment regarding the determiner

phrase, whereas the on-line task asks a much more implicit question of semantic judgment via the plausibility judgment question referring to the context and target sentences. Errors on the semantic judgment task would be selecting the incorrect interpretation (of the two available), and errors on the self-paced reading task would be selecting the wrong plausibility rating on the comprehension question. Additionally, on the self-paced reading task, we expect to see longer reading times for the conditions in which the adjective-noun order in the target sentence does not correspond to the meaning supported by the context regardless of the adjectival placement due to the extra processing time taken once the participants realize the mismatch between the context and the target sentence. In both the on-line and off-line tasks, we expect to see better scores across the three groups on items to contain the meaning changing adjectives than on the experimental items, keeping in mind that there is a more marked change semantically in those types of adjectives. If the learners do not perform natively on either the on-line or off-line tasks, we would attribute the problems to representational deficits. However, if the learners perform well on the off-line or the on-line task, we would find evidence in support of full access to UG. Like Rothman et al., we do expect to see results inconsistent with representational deficits.

These are the highlights of our hypotheses and expected outcomes. We have laid out all our predictions in the second discussion section in Chapter 6, where we discuss each point.

CHAPTER 4 METHODOLOGY

Participants

This study recruited participants from the University of Florida community. In total, 39 subjects completed the study: 13 native speakers of Spanish, 10 heritage speakers of Spanish, and 13 native English-speaking learners of Spanish. Three participants were excluded from analysis because their Spanish background did not conform to the categories of native/heritage/learner discussed below and had low proficiency scores with respect to the group they would have been placed into. Therefore the data analysis mentioned below will use 36 participants. These 36 participants were composed of 9 males/27 females, 18-25 years of age (see Table 4-1), and had no reading or learning disabilities. Participants were compensated for their participation either monetarily at \$7.50 per hour, or by receiving class credit for research hours.

Compared to Rothman et al., additional measures were used to divide the participants into proficiency levels due to the smaller number of participants. Previously, to qualify as a native speaker, a participant would need to score a 48 or better on the DELE proficiency task. Scores on the proficiency task alone made for a very small group of native speakers. Though, it was clear that some speakers were in fact native speakers of Spanish even though they did not score as such on the task, due to the age at which they moved to the US from a Spanish speaking country. Therefore, we also took into consideration the length of time the participants lived in a Spanish speaking country before arriving in the US. The requirements for qualifying as a native

speaker of Spanish here included higher scores on the DELE proficiency task (refer to Table 4-1, ranging 34-49, average 45; excluding one participant 41-49 average 46, which is just shy of reaching the threshold for qualifying as a native speaker) and an extended amount of time living in a Spanish speaking country. All native speakers lived outside of the United States until at least age 6 and referred to Spanish as their first and primary language.

Inadvertently, this study contained a decent sized group of heritage speakers. The general definition for heritage speaker used here was a person who grew up speaking Spanish at home, while living in an area where the language outside the home was English. A technical definition for heritage speaker would be “A student who is raised in a home where a non-English language is spoken, who speaks or merely understand the heritage language, and who is to some degree bilingual in English and the heritage language” (Valdés, 2000). Keeping in mind that this study was conducted in the state of Florida, which has a fairly sizeable Spanish-speaking population, it is not surprising that many potential subjects were raised in a heritage language environment. Since these types of Spanish speakers are qualitatively different from either native speakers or learners of Spanish, they were placed in their own group. We categorized a speaker as a heritage speaker if they grew up in the US, and said that they learned Spanish and English both before age 5. These speakers also noted that, in general, they preferred using Spanish over English at least 25% of the time, and scored decently on the proficiency task (range 35-47, average 42, which qualifies as an advanced speaker).

Finally, participants were grouped as learners of Spanish if, of course, they were not native Spanish speakers or heritage speakers. This means that they called English their first and primary language, and did not begin learning Spanish until they were exposed to it in school or some other language environment outside the home. Due to low numbers of participants (n=13), we were not able to divide these speakers into various levels of Spanish proficiency. Instead, they were all grouped together. Their proficiency scores ranged from 27-45, with an average of 36, which is intermediate in level.

Table 4-1. Participant demographics by group

	Native mean (Standard Deviation)	Heritage (Standard Deviation)	Learner (Standard Deviation)
Preferred use of Spanish (% of time)	44.7 (20.6)	33.5 (10.3)	9.9 (6.4)
English onset (age in years)	6.5 (3.6)	2.1 (1.4)	0 (0)
Spanish onset (age in years)	0 (0)	0 (0)	10.4 (4.5)
DELE proficiency scores (correct answers out of 50)	45 (3.7)	42 (3.5)	36 (6.7)
Age (years)	20.8 (1.2) (19-23)	20.3 (1.8) (18-25)	20.4 (1.0) (19-22)
Gender (M,F)	4,9	0,10	5,8

Stimuli/Experimental Design

Targets

The list of adjectives used in the target sentences in the present study was chosen for their frequency and simplicity. We wanted to ensure that all adjectives would be comprehensible to all levels of Spanish speakers, including the lower level Spanish

learners. Therefore, several of the target adjectives were cognates in English. The list used is as follows:

aburrido “boring”, *apasionado* “passionate”, *aventurero* “adventurous”, *barato* “cheap”, *bonito* “pretty”, *cariñoso* “caring”, *caro* “expensive”, *débil* “weak”, *delgado* “thin”, *deshonesto* “dishonest”, *difícil* “difficult”, *divertido* “fun”, *elegante* “elegant”, *enojado* “angry”, *estudioso* “studious”, *estúpido* “stupid”, *feo* “ugly”, *fuerte* “strong”, *gordo* “fat”, *honesto* “honest”, *importante* “important”, *influyente* “influential”, *inteligente* “intelligent”, *ocupado* “busy”, *orgulloso* “proud”, *patético* “pathetic”, *pesado* “heavy”, *perezoso* “lazy”, *simpático* “nice”, *talentoso* “talented”, *tímido* “shy/timid”, and *valiente* “brave.”

Each item, meaning each adjective listed above, of the experimental materials contained a 4-way set of sentences, or paradigm, which were Latin-squared over four separate lists. By 4-way set of sentences, we mean that each item had a grammatical and an ungrammatical (or better stated, a plausible versus an implausible; see discussion below in Chapter 6) version of both the pre and post nominal adjectival positioning (refer to Table 4-2). That means that each item (for example *delgado*) had the following four target sentences: a) adjective before noun, grammatical; b) adjective before noun, ungrammatical; c) noun before adjective, grammatical; d) noun before adjective, ungrammatical (see Appendix A for full list of experimental items).

Table 4-2. Conditions explained by word order in determiner phrase

Grammaticality	Condition	4	5	6
Gram. (plausible/felicitous)	a, F1		D	Adj N
Ungram. (implausible/infelicitous)	b, F2		D	N Adj
Gram. (plausible/felicitous)	c, F3		D	N Adj
Ungram. (implausible/infelicitous)	d, F4		D	Adj N

Every target sentence is preceded by a context sentence. These context sentences forced either the pre or post-nominal reading for the target sentence. The context sentence was the same for conditions a and b, as well as c and d, but different between those two pairings. In other words, the same context sentence preceded

conditions a and b, but a different context sentence preceded conditions c and d. Keep in mind that the only thing that differed in the target sentences was the adjective placement. What made the target sentences ungrammatical, as it was in conditions b and d, was that the context sentence forced a pre or post-nominal reading, and the target sentence contained the opposite adjective placement. For example, condition b, which has the adjective after the noun in an ungrammatical way, would be ungrammatical because the context had a pre-nominal adjective reading, but the target sentence showed a post-nominal adjective placement. Below is an example of one complete set of context and target sentences (Figure 4-1):

Context 1: *Todos los estudiantes son muy listos y van mucho a la biblioteca para estudiar y aprender los textos.*

“All students are very smart and go to the library a lot in order to study and learn their materials.”

Condition a:

Por eso 1/ es 2/ que 3/ los 4/ inteligentes 5/ estudiantes 6/ sacan 7/ buenas 8/ notas 9/ en 10/ los 11/ exámenes. 12/ (all students are intelligent)

“That is why intelligent students make good grades on exams.”

Condition b:

**Por eso 1/ es 2/ que 3/ los 4/ estudiantes 5/ inteligentes 6/ sacan 7/ buenas 8/ notas 9/ en 10/ los 11/ exámenes. 12/ (only the students who are intelligent)*

Context 2: *Las clases son muy avanzadas, entonces hay pocos estudiantes que entienden el material.*

“The classes are very advanced, therefore there are few students who understand the material.”

Condition c:

Por eso 1/ es 2/ que 3/ los 4/ estudiantes 5/ inteligentes 6/ sacan 7/ buenas 8/ notas 9/ en 10/ los 11/ exámenes. 12/ (only the students who are intelligent)

“That is why intelligent students make good grades on exams.”

Condition d:

**Por eso 1/ es 2/ que 3/ los 4/ inteligentes 5/ estudiantes 6/ sacan 7/ buenas 8/ notas 9/ en 10/ los 11/ exámenes. 12/ (all students are intelligent)*

Figure 4-1. Full example of an experimental item

As you can be seen, the same target sentence is used for all four conditions, with the adjective being the only alternating factor. This ensures that the context sentence is the only thing that forces the differences in meaning between conditions a/b and c/d. The targets are purposefully vague enough to follow logically from each of the two context sentences.

Since there were four lists into which these items were divided and each item had four conditions mentioned above, it is easy to see that one of each condition of these items went into one of the four lists, with no same condition of any item appearing in the same list. For example each list contained one condition of all the 32 adjectives mentioned above, but none of these conditions were repeated in any list. The 32 adjectives combined with a separate set of nouns to complete a set of 32 determiner phrases in the target sentences. These DPs, which contained a determiner, noun, and adjective, always occupied the 4th, 5th, and 6th frame position in the target sentences. Though no adjectives were repeated over the 32 target sentences, a few of the nouns were repeated (*niños* “children”, *coches* “cars”, *estudiantes* “students”). This was done in order to ensure that very strong and appropriate examples of each adjective were present.

Much care was given to ensure that these 4 lists were as equal and counterbalanced as possible. The lists were created by counterbalancing the items based on the following criteria: frequency of the adjective; frequency of the noun; length of the adjective; length of the noun; and length of the word immediately following the critical items (either the noun or adjective, depending on whether the adjective was pre or post-nominal). Frequency data was taken from the online website Corpus Del

Español (www.corpusdelespanol.org). We created 4 groups of the 32 experimental adjectives and nouns (meaning 8 in each group) that were not statistically equivalent on any of the 5 criteria just mentioned. For each group of the 4 groups (since 32 adjective + noun combos breakdown into 8 items in the 4 groups), one of the four conditions mentioned in the previous paragraph (a, b, c, d) went into the 4 lists. This is what was Latin-squared over the 4 lists. In other words, each list contained the 32 experimental adjective + noun combos, which was composed of 8 of each condition (a, b, c, and d), each of which come from a different group of the 4 statistically different groups. We also paired these lists in the Latin-square design in such a way that the items containing the same noun were in the most opposing conditions as possible. This means that when *coche* was used twice in a list, it appeared in conditions a and d, or b and c, which had opposing adjective placement and grammaticality. Each participant saw one of the 4 lists during the self-paced reading task. All lists were checked multiple times by native Spanish speakers to ensure correct grammar, spelling, and that the manipulations were accurately forcing the correct readings.

Meaning Changers

Within the group of fillers, we incorporated a separate group of specific adjectives. As previously mentioned, these are the meaning changing adjectives.

Below is a list of the 12 we utilized.

alto “tall, high”, *cierto* “true, certain”, *listo* “ready, smart”, *pobre* “poor”, *puro* “pure, purely”, *raro* “rare, strange”, *real* “real, royal”, *seria* “serious”, *simple* “simple, mere”, *solo* “alone, single”, *unico* “unique, only”, *viejo* “old, long-time”

We selected these 12 meaning changing adjectives, which are those that had the strongest difference in meaning pre and post-nominally. Each was used twice, with different nouns, making 24 total meaning changing items. We did not feel that there was a large enough set of strong meaning changing adjectives to create a group without repeating any adjectives, so thought it best to double-up on these 12 instead. These had the same 4 condition paradigm mentioned above with the target materials, with pre versus post-nominal adjective placement and grammatical versus ungrammatical. Just like the targets, these meaning changing adjectives were counterbalanced across the 4 lists for length of the noun and adjective within the DP and length of the word immediately following the DP, as well as the frequency of the noun and adjective. The groups that went into each of the 4 lists (6 in each list from the 24 total meaning changing adjectives) were found to be statistically unequal in the same aspects of frequency and word length mentioned above with the experimental items. Since we had a repeat of all the meaning changing adjectives, similar to the repeat of a few of the nouns within the target pairings, we made sure that in each of the 4 lists, the repeated adjective, which appeared 2 times in each list, appeared in opposite conditions (a with d, or b with c). This helped to make these items as different as possible within the lists and to reduce potential effects of repetition on reading times. No nouns were repeated in the meaning changing DPs. Again, the pre-nominal conditions (both grammatical and ungrammatical) saw the same context sentence, and the post-nominal conditions saw the same context sentence, which was different from the context sentence of the pre-nominal adjective + noun pairings. Essentially the target pairings and the meaning

changing pairings were nearly identical, with the exception that there are fewer meaning changing items in total, and the meaning changing adjectives were repeated fully.

So in total, each participant saw 32 target sentences, 24 meaning changing sentences, and 72 filler sentences for a sum of 128 items. These fillers consisted of 36 plausible sentences, and 36 implausible sentences. By plausible or implausible, we mean logically possible or not, without respect to grammaticality or any other aspect. For example, *Los días de verano son llenas del sol*, “Summer days are filled with sun”, followed by, *Es por eso que estos días son muy fríos*, “That is why these days are very cold.” They contained no pre or post-nominal adjectives. We did not use a 4-way paradigm here. Instead each filler item was solely a context sentence and a target sentence.

Procedure

This study consists of the following 8 parts, in this order:

Informed Consent

Language Questionnaire

Spanish Proficiency Task, DELE

Self-Paced Reading Task

Debriefing

Vocabulary Task

Semantic Judgment Task

- Meaning Changers
- Experimentals

Before the experiment began, all participants gave written informed consent, as per University of Florida Institutional Board Protocol.

The first task was a variant of the LEAP-Q language questionnaire created by Marian, Blumenfield, & Kaushanskaya (2007). The purpose of the questionnaire is to obtain as much information as possible about the linguistic background of each participant. Of particular interest will be to ascertain: the method with which each participant learned Spanish and English, whether it be through schooling or contact with other native speakers, or any other method; when they began learning each language; the current percentage of usage of each language; when/if they moved to the US from a Spanish speaking country; and general demographic questions such as age, gender, race, etc.

Second was a Spanish proficiency task. The task used here was the DELE Spanish proficiency task. This was a 50-question test. The first 30 questions gave a sentence with a blank towards the end of the sentence, and 4 possible responses to choose from. The final 20 questions were in the format of a cloze test. The participants read a paragraph, filled with 20 blanks, and had 3 options per blank to choose from to complete the sentences. Previously, the level of Spanish was determined as follows: 50-48 correct answers = native speaker; 47-40 = advanced speaker; 39-30 = intermediate speaker, <29 = beginner. Question #9 on the cloze test presented a problem. We noticed that the participants consistently chose the incorrect response. After reviewing the test, we decided that we would accept 2 possible responses for that question, meaning anyone that had answered the correct response or the frequently chosen response received credit for that question. As mentioned above, these scores

contributed in large part to whether the participant was categorized as native, heritage, or learner, though it was not the only factor.

The third, and arguably most demanding task was the self-paced reading task, which we have explained above. This task was completed on a computer in a separate room in the lab. Each participant was guided to this room by our native Spanish-speaking assistant, where the participant was seated in front of a computer. The assistant explained the directions to the participant in Spanish, the purpose of which was to put the participants in a Spanish speaking mindset before beginning the task. The instructions were also presented on the screen, in Spanish. Once the instructions were explained, the participants went through 8 practice questions while the assistant remained in the room. These practice questions were identical in form to the fillers, and did not contain any pre or post-nominal adjectives. There were 4 plausible and 4 implausible questions. This allowed the participants to ask questions before they continued on to the actual test questions. The experiment itself consisted of 2 blocks of 64 items (context sentence, target sentence, plausibility question), with a short break in between.

Since this was a self-paced reading task, the context sentence appeared on screen as a whole, while the target sentence appeared word-by-word, as controlled by the participant. The target sentence initially appeared as a set of blanks, and with each button click, a new word in the sentence appears while the previous word became a blank line again. After the final word of the target sentence disappeared, the participant was presented with a plausibility judgment question. They had to determine how plausible the second sentence (target) was with respect to the first sentence (context).

The options were: 1-completely plausible; 2-plausible; 4-implausible; 5-completely implausible. We removed the neutral option of 3 to force the participants into making a decision on plausibility in one of the 2 directions. The purpose of these questions was to keep the participants on task, and to test if they were making correct judgments with respect to grammaticality and adjective placement.

Directly after the self-paced reading task, the participants completed a debriefing form. This questionnaire allowed the subjects to voice any opinion they had about the task or problems they experienced with the preceding task. This included questions about the font size, length of task, ease of task, etc. Answers to these questions were initially important to resolve any outstanding problems with the task that the researchers may have not noticed or overlooked. Ultimately, the responses were informative, but the task itself did not undergo any changes due to responses.

Each participant then completed a brief translation task. This task contained all the adjectives (32) and nouns (29) that were used in the target items of the self-paced reading task. All were listed in Spanish, and the participant was asked to provide the English translation. We wished to check that the participants knew the meanings of the targets to ensure that any problems that arose in the self-paced reading task were not due to lack of knowledge of Spanish. Some of the native Spanish speakers were not able to provide English translations, due to lack of knowledge of the English term, and not a lack of Spanish knowledge. This is something to take into consideration when looking at the scores on this task.

The final two tasks were semantic judgment tasks. These tests were based off the Semantic Interpretation task used in Rothman (2010) (See Figure 4-2). Each

question showed a sentence, with the DP underlined, and two options for the interpretation of the underlined portion. The structure was the same as in the Rothman study, but new sentences and options for interpretation were created for this study. See below:

1. Mi tío es un pobre hombre.

My uncle is
unfortunate.

The man is
not wealthy.

Figure 4-2. Semantic interpretation task

The first of the two semantic judgment tasks tested the meaning changing adjectives and the second tested the target adjectives. In the shorter, meaning changing adjective test with 13 questions, the two options for interpretation were alternated as to whether the pre-nominal or post-nominal interpretation appeared in the first column so as to prevent any correlation between the placement of the adjective in the sentence and the column. For the target adjective test containing 32 questions, the first column consistently had a pre-nominal or kind-denoting reading, while the second column had a post-nominal, set-denoting reading. The sentences themselves, in both tasks, had alternating pre and post-nominal DPs in no specific order. The sentences in this task were not the same as those used in the self-paced reading task.

CHAPTER 5 RESULTS

Off-Line

We completed one-way ANOVAs to test the means of the three groups in question (natives, heritage, and learners) with respect to their performance on the vocabulary test, the semantic judgment task on meaning changing adjectives, and the semantic judgment task on the experimental adjectives. No significant differences were found among the groups on the three measures: Vocabulary: ($F(2, 33) = .474, p = .627$); errors in meaning changers semantic task: ($F(2, 33) = .833, p = .444$); errors in experimentals semantic task: ($F(2, 33) = .925, p = .406$).

Table 5-1. Off-line task scores, by group

Group	Vocabulary errors, out of 57 (Standard Deviation)	Meaning Changers errors, out of 13 (Standard Deviation)	Experimentals errors, out of 32 (Standard Deviation)
Natives	2.7 (3.6)	3.0 (0.9)	15.5 (4.1)
Heritage	2.0 (1.6)	3.7 (1.4)	15.9 (4.0)
Learners	3.4 (3.8)	3.3 (1.4)	12.5 (9.1)

On-Line

The following statistical analyses, as well as the analyses for the offline data, were completed using version 20 of the SPSS software. In order to be considered statistically significant, we restricted our analyses to only results that were below $\alpha < .05$. We tested both the experimental items and the meaning changers. Our three areas of interest were with the accuracy of the plausibility question, the reaction time of the plausibility question, and the reaction times at word positions 4-9. For all repeated measure ANOVA tests, we used the univariate analyses.

Accuracy

Experimentals

We completed a repeated measures ANOVA with the within subjects factors of Grammaticality (grammatical a/c or ungrammatical b/d) and Adjective Placement (pre-nominally a/d, or post-nominally c/b), and a between subjects factor of Group for the experimental conditions to analyze the accuracy of responses to the end of sentence plausibility judgment task. Participants had four options to choose from (1, 2, 4, 5). For grammatical target sentences, answers were counted as accurate if they chose either 1 or 2, and inaccurate if they chose either 4 or 5. The opposite was true for ungrammatical target sentences. Mean and standard deviation of the accuracy of the experimental materials can be found in Table 5-2. We found a significant effect of Grammaticality ($F(1, 33) = 878.34, p < .001$) and a significant interaction between Grammaticality and Group ($F(2, 33) = 4.53, p = .018$).

For the effect of Grammaticality, we can see by looking at the means below that the accuracy for the grammatical conditions (a and c) was much higher than those of the ungrammatical conditions (b and d). We then looked at the interaction effect by singling out each group to compare the grammatical versus ungrammatical conditions. All three groups showed significant differences between these conditions: Group 1, natives: ($F(1, 12) = 579.62, p < .001$); Group 2, heritage: ($F(1, 9) = 157.68, p < .001$); Group 3, learners: ($F(1, 12) = 288.66, p < .001$). In all groups, the grammatical conditions were much more accurate compared to the ungrammatical conditions. Table 5-3 below shows percentage accuracy by group, which includes both the experimentals

and meaning changers. We did further T-tests to learn if any specific group had a statistically smaller difference between the grammatical and ungrammatical conditions. All effects were insignificant except the differences between the pre-nominal conditions (a and d) between groups 1 and 3 (the natives and learners) ($t(24) = 3.75, p = .001$). There was a much larger difference between the natives' accuracy than the learners.

Given that every question had two correct possible answers, one being plausible or implausible, and the other being very plausible or very implausible, we conducted a second repeated measure ANOVA to test whether the participants showed any difference in accuracy between the extreme responses (1 and 5) compared to the non-extreme responses (2 and 4). We were curious to see if the accuracy rates went up at all for the items where the participants responded with a very (im)plausible answer. The within subject factors were plausibility (plausible or implausible) and extremity (1/5 or 2/4), and the between subjects factor used was Group. No significant effects or interactions were found.

Meaning changers

We completed a repeated measures ANOVA with the within subjects factors of Grammaticality (grammatical F1/F3 or ungrammatical F2/F4) and Adjective Placement (pre/post-nominally, F1/F4, F3/F2) and a between subjects factor of Group for the meaning changers. Table 5-4 below shows the breakdown of the accuracy means per condition. This showed a significant effect of Grammaticality ($F(1, 33) = 54.50, p < .001$), but no other effects or interactions were found. Just as with the experimental items, the grammatical conditions were consistently more accurate than their ungrammatical counterparts. No further tests were conducted. To compare the

accuracy of the experimental items with the meaning changers, Figure 5-1 is presented below.

The previous analyses were collapsed over items, which is commonly referred to as a by subject (F1) analysis. We also attempted to complete an F2 analysis, which would be by item, collapsing over participants. The F2 analysis was not possible with either the experimentals or meaning changers, since data was not available for every condition in each group due to lack of having at least one member from each group complete each of the four lists.

Table 5-2. Accuracy on plausibility questions, by condition, experimentals

conditions	Mean	Standard Deviation
a: gram, AN	.830	.144
b: ungram, AN	.101	.107
c: gram, NA	.826	.135
d: ungram, NA	.174	.128

Table 5-3. Accuracy on plausibility questions, by group

Group	a	b	c	d	F1	F2	F3	F4
1 -native	.89	.07	.84	.13	.71	.33	.77	.27
2 -heritage	.81	.11	.85	.15	.62	.33	.60	.42
3 -learner	.78	.13	.80	.24	.60	.33	.67	.38

Table 5-4. Accuracy on plausibility questions, by condition, meaning changers

conditions	Mean	Standard Deviation
F1: gram, AN	.644	.215
F2: ungram, AN	.333	.207
F3: gram, NA	.685	.245
F4: ungram, NA	.352	.168

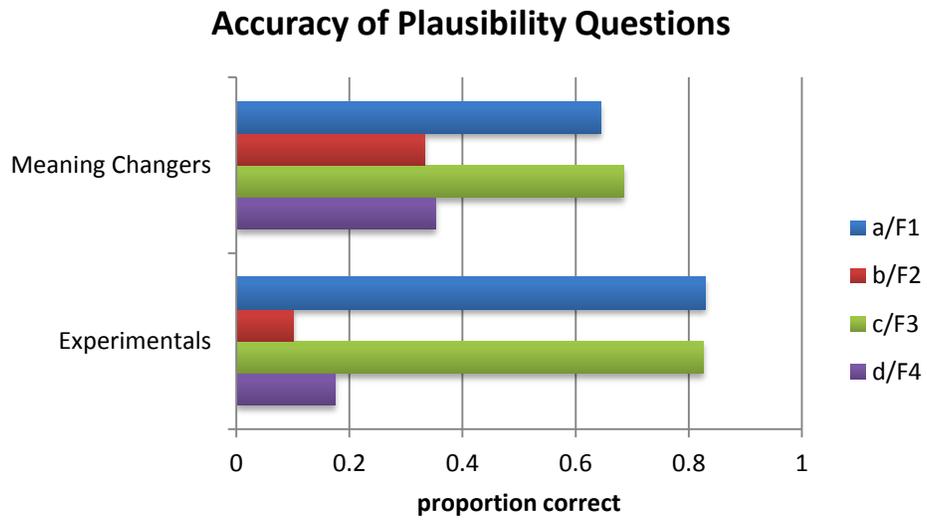


Figure 5-1. Accuracy of plausibility questions, comparing meaning changers and experimentals

Reaction Time

Questions

Experimentals

Reaction time data for the plausibility judgment questions is shown in Figure 5-2 and Figure 5-5 below. Reaction times were analyzed only for the questions that the participants responded to correctly. This meant that, for certain subjects, no data was available for analysis in certain conditions, particularly in the ungrammatical conditions (b and d). We also ran an Excel macro to remove any data that was more than two standard deviations greater than the overall mean. Above we saw that only approximately 10% of the responses to the ungrammatical questions were accurate. Thus, we must keep in mind that the number of analyzable trials is greatly reduced, which in turn reduces the power of the statistics. We conducted a repeated measures ANOVA, using Adjective Placement and Grammaticality as the within subjects factors (two levels in each), and the between subjects factor of Group. No significant effects or interactions were found.

Meaning changers

Reaction time data for the plausibility judgment task was also analyzed only for those questions with correct answers in the meaning changers. Again, limited data was available for analysis in certain conditions, such as the ungrammatical conditions (F2 and F4). We conducted a repeated measures ANOVA, using Adjective Placement and Grammaticality as the within subjects factors (two levels in each), and the between subjects factor of Group. Here we found no significant effects, though we found a

significant interaction between Adjective Placement and Grammaticality ($F(1, 26) = 6.02, p = .021$). Further paired t-tests showed a significant difference between conditions F1 (adjective first, grammatical) and F4 (adjective first, ungrammatical) ($t(32) = -2.43, p = .021$). By looking at the reaction time means in the Figure 5-3 below, we can see that the F4 condition was much longer than the F1 condition. This corresponds to low accuracy in the F4 condition, which is not indicative of a speed-accuracy tradeoff. Normally, we might expect that the conditions that have the least accurate results are also the ones with the shortest reaction times, but that is not what we find here.

Just as with the accuracy analyses, we were only able to complete an F1 analysis on subjects, as opposed to an F2 analysis on each item we tested. Many items did not have any data to analyze.

Table 5-5. Response time to plausibility questions, by condition, experimentals

conditions	Mean (ms)	Standard Deviation (ms)
a: gram, AN	1667	883
b: ungram, AN	2180	1522
c: gram, NA	1934	1110
d: ungram, NA	2697	2176

Table 5-6. Response time to plausibility questions, by condition, meaning changers

conditions	Mean (ms)	Standard Deviation (ms)
F1	1942	1440
F2	2318	1427
F3	2297	1695
F4	3135	2769

Table 5-7. Mean response time to plausibility questions, by group, meaning changers and experimentals (in ms.)

Group	a	b	c	d	F1	F2	F3	F4
1	1603	1541	1680	3326	1355	2832	2436	3860
2	1616	2586	2032	2710	1825	1858	2042	2949
3	1769	2354	2113	2165	2611	2091	2354	2564

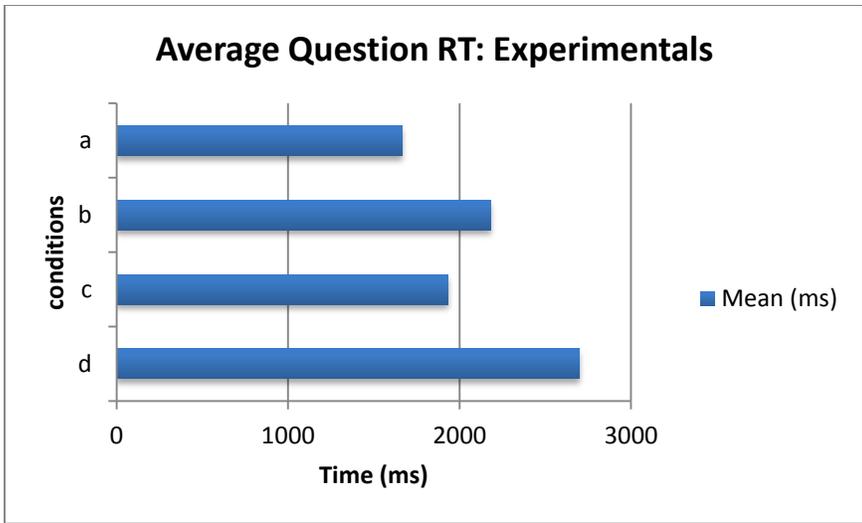


Figure 5-2. Average reaction time to end of sentence plausibility question, by condition, experimentals

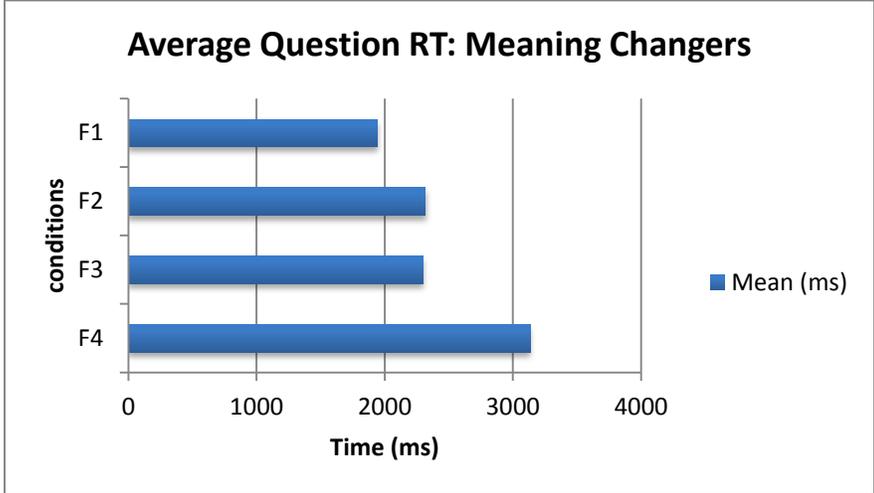


Figure 5-3. Average reaction time to end of sentence plausibility question, by condition, meaning changers

Sentence Level Reaction Times, Word Positions 4-9

Experimentals

Word positions 4-9 in the self-paced reading sentence were examined for latency of the response for each position. The same cut-off procedure (Excel macro) was used for this data as was used previously with the reaction time to the end of sentence questions. Word position #4 was always the determiner, #5 and #6 were either the target noun or adjective, and positions #7, #8, and #9 were the three words directly following the determiner phrase. Analysis was not conducted beyond word position #9 as we did not expect spillover effects beyond this point. Also, some of our target sentences ended at word position 10, so we also chose word position 9 as our cutoff in order to avoid confounds due to end of sentence wrap-up effects. We conducted repeated measures ANOVAs on the conditions that had the same adjective placement (a vs. d, b vs. c), so that we would be comparing reading times on the same part of speech. Otherwise, we would essentially be comparing apples and oranges by looking at reading times of adjectives versus nouns, for example when comparing condition a and b, which have alternating nouns and adjectives in word positions #5 and #6.

For conditions a and d, we conducted a repeated measures ANOVA, using the within subject factors of Grammaticality (two levels) and Word Position (six levels) and the between subject factor of Group. No effect of group was found. We did find a significant effect of Word Position ($F(5, 29) = 60.64, p < .001$) and an interaction between Grammaticality and Word Position ($F(5, 29) = 7.61, p < .001$). Further t-tests showed longer response times for the ungrammatical condition (d) at word position #4 (the determiner, $t(35) = -2.55, p = .015$), and for the grammatical conditions (a) at word position #6 (the noun, $t(35) = 2.26, p = .030$) and word position #8 (two places

after the determiner phrase ended, ($t(35) = 2.66, p = .012$)). See Figures 5-4 and 5-8 through 5-11 below.

For conditions c and b, we found significant effects of Word Position ($F(5, 29) = 71.49, p < .001$). No other interactions were found. See Figures 5-5 and 5-8 through 5-11.

Meaning changers

The same tests were conducted for the meaning changers as for the experimentals. We compared conditions F1 and F4 first (adjective first conditions). Another repeated measures ANOVA was carried out, using the within subject factors of Grammaticality (2 levels) and Word Position (6 levels), and the between subject factor of Group. No effect of Group was found. We found a significant effect of Word Position ($F(5, 29) = 32.74, p < .001$) and a significant interaction between Grammaticality and Word Position ($F(5, 29) = 3.19, p = .016$). Further t-tests showed longer response times for the ungrammatical condition (F4) at word position #8 (two places after the determiner phrase ended, ($t(35) = -2.76, p = .009$)), and for the grammatical condition (F1) at word position #5 (the noun, ($t(35) = 2.36, p = .024$) and #7 (the word immediately following the DP, ($t(35) = 2.12, p = .041$)). See Figures 5-6 and 5-12 through 5-15.

Additional investigation

Although no significant results were found in the experimentals or meaning changers with respect to the factor Group, we decided to take a look at each of our groups individually for both the experimental items and the meaning changers to see if any patterns emerged for the sake of future research or if this study were to be repeated

(with changes, of course), even though they would not be statistically significant. Below are the graphical representations of the reaction time data, by group, for word positions 4-9 in the experimental items (refer to Figures 5-4, 5-5, and 5-8 through 5-11).

We can see in the experimentals that the learners and heritage speakers do show differences in conditions a and d, compared to the natives, immediately after viewing the adjective in its non-canonical order. Since the adjective occurs in position #5, we see spill-over effects at position #6. This effect is delayed in the native speakers it seems, until the 7th word position. We do see an effect of Adjective Placement in word #6 for all groups, but as we noted above, we are comparing different word categories, so this difference does not hold much significance. Conditions b and c differ very slightly in any of the groups, at any word position. This is another indication of the lack of perception of grammaticality. Though we do see effects of grammaticality that are significant at word position #7 for the natives, and at word position #6 for the heritage speakers. What is interesting about both of these effects is that the grammatical condition (condition a) of the pre-nominal adjective placement has longer reading times than the ungrammatical condition (condition d). We would expect the ungrammatical condition to show increased length of reading time, but that is not what we see. We double and triple checked the coding of these conditions to be sure this was not a coding error. The only difference in the presentation of these materials is the context sentence, which intends to force a pre or post-nominal reading. This causes no effects in conditions b and c, so it is puzzling as to why we do see effects in a and d. There does not seem to be a logical reason for this effect, and we are open to suggestions that may explain it.

Finally we looked at the differences in groups for the meaning changers. Below (in Figures 5-6, 5-7, and 5-12 through 5-15) we see that the peak reaction times occur consistently at word position #7. This effect occurs directly after the DP, similarly to what we saw in the natives for the experimental items. We also consistently see that the AN ordered conditions have longer reading times than the NA ordered conditions. The effects of Adjective Placement increase in significance as the proficiency level of the group decreases. We see that there is almost an effect of Adjective Placement in the native speakers ($F(1,12) = 4.75, p = .054$), there is an effect for the heritage speakers ($F(1,9) = 7.23, p = .025$), and there is a strong effect for the learners ($F(1,12) = 38.98, p < .001$). This seems to hint at the idea that the more proficient speakers are less affected by the non-canonical word ordering than the learners. This agrees, to some extent, with the results we saw with the experimental items. The less proficient speakers, namely the heritage speakers and the learners, showed a more immediate reaction to the non-canonical word ordering, and thus we see longer reading times at word position #6, instead of #7. The natives, though, have much shorter reading times at position #6, likely due to the fact that they are not as affected by the appearance of pre-nominal adjectives.

There is no effect of grammaticality between conditions F1 and F4 in any of the groups at word position #7. So even if the natives may have an easier time processing both of the word orders with the meaning changers, no group is sensitive to the manipulations of grammaticality. In word position #8, though, which is two positions after the end of the DP, we see that the native speakers show that the grammatical position, F1, has a shorter reading time than F4, though this is not found to be

statistically significant. We were hoping for this effect to be significant across the board, but unfortunately this is the only place we see any sign of it.

Between conditions F3 and F2, a repeated measures ANOVA found significant effects of Word Position ($F(5, 29) = 25.628, p < .001$), but no other interactions. See Figures 5-7 and 5-12 through 5-15.

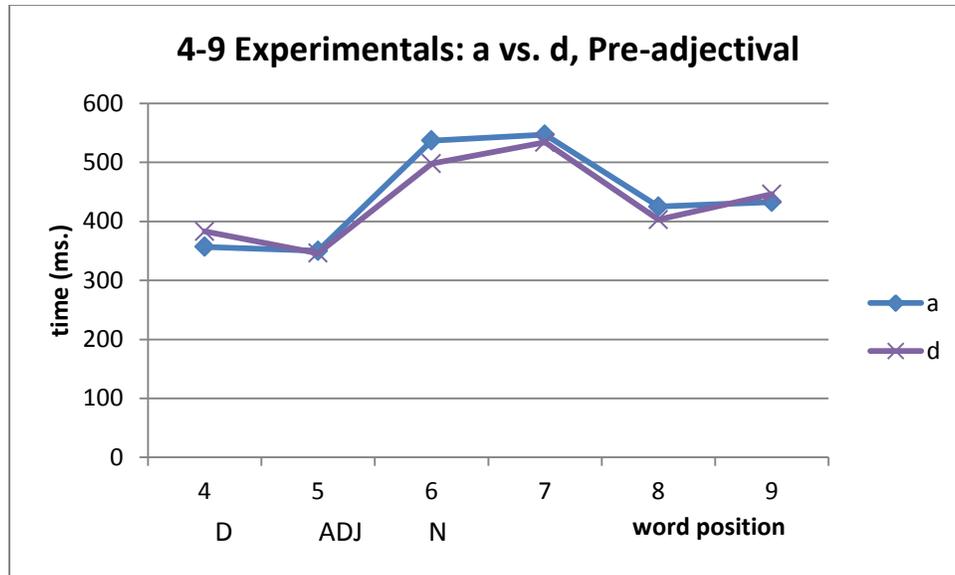


Figure 5-4. Reaction times on word positions 4-9, conditions a and d, experimentals

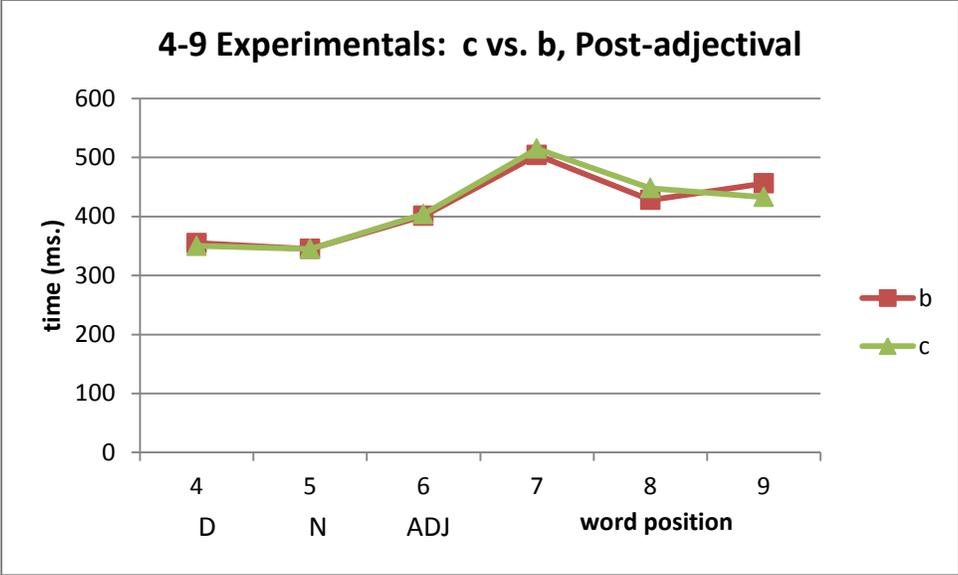


Figure 5-5. Reaction times on word positions 4-9, conditions c and b, experimentals

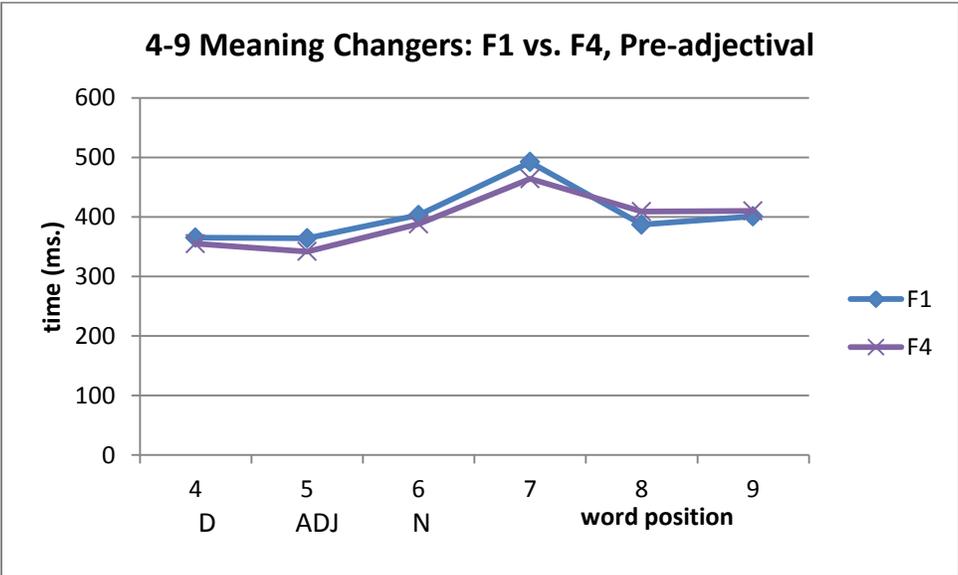


Figure 5-6. Reaction times on word positions 4-9, conditions F1 and F4, meaning changers

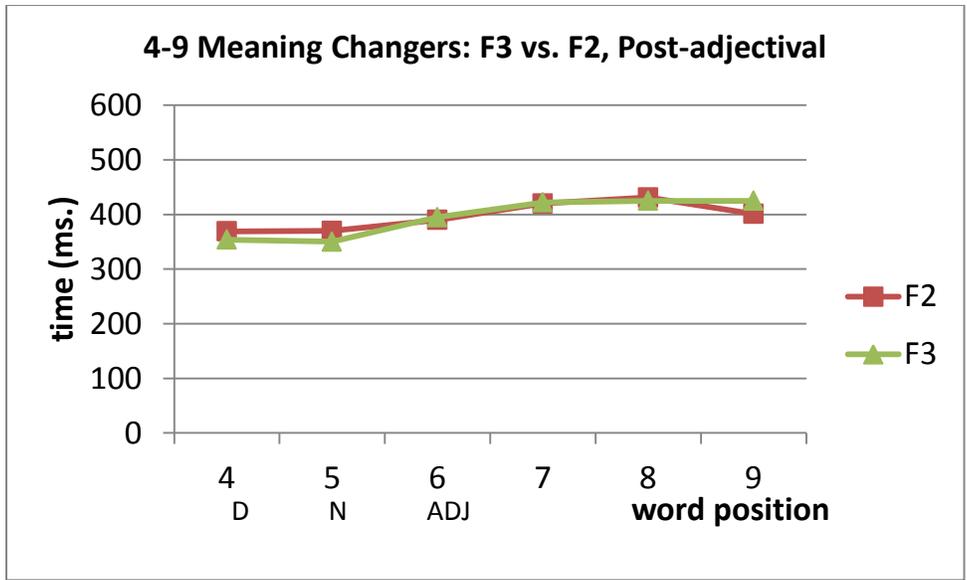


Figure 5-7. Reaction times on word positions 4-9, conditions F3 and F2, meaning changers

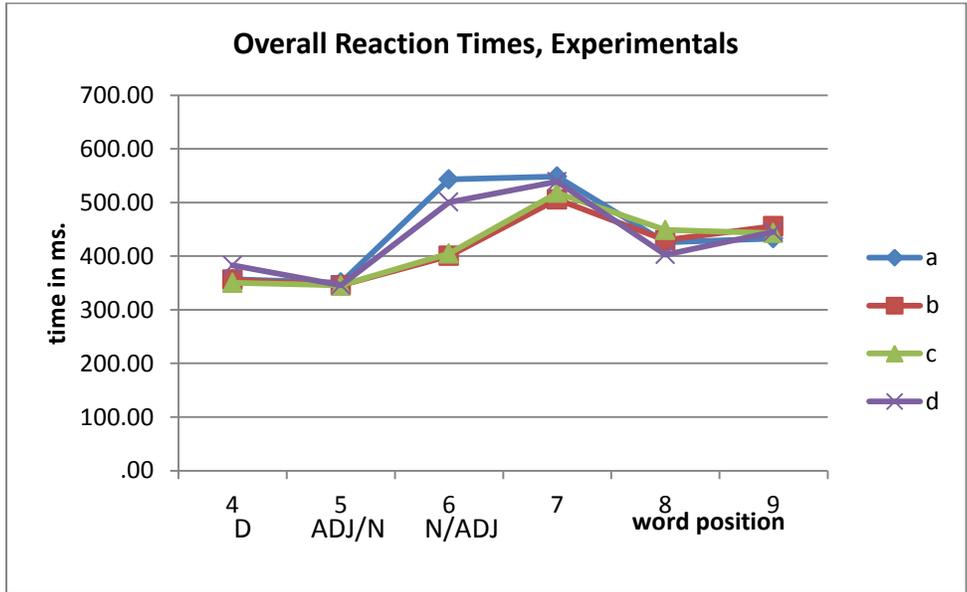


Figure 5-8. Reaction times for experimental conditions by word position, overall

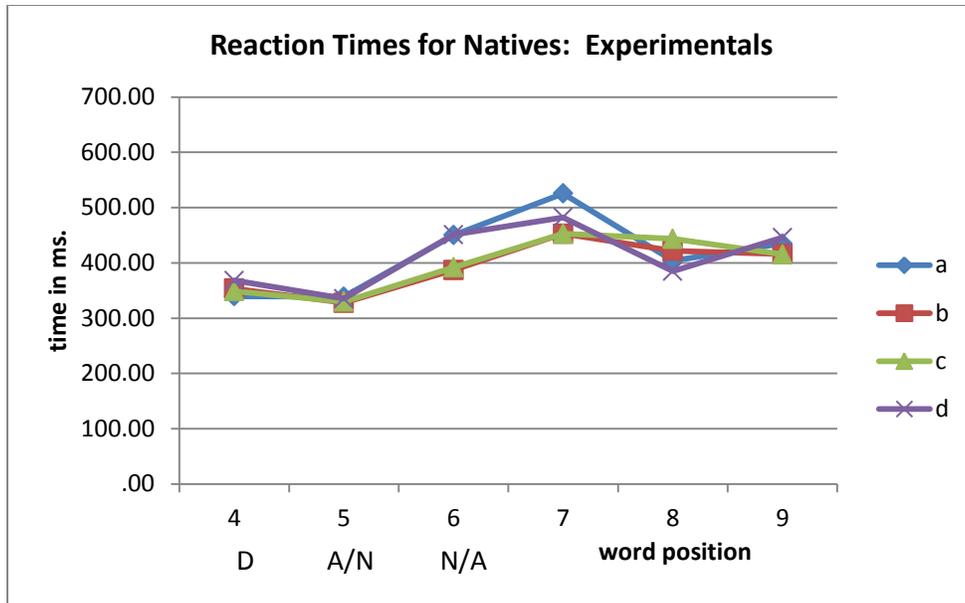


Figure 5-9. Reaction times for group 1 by word position, natives, experimentals

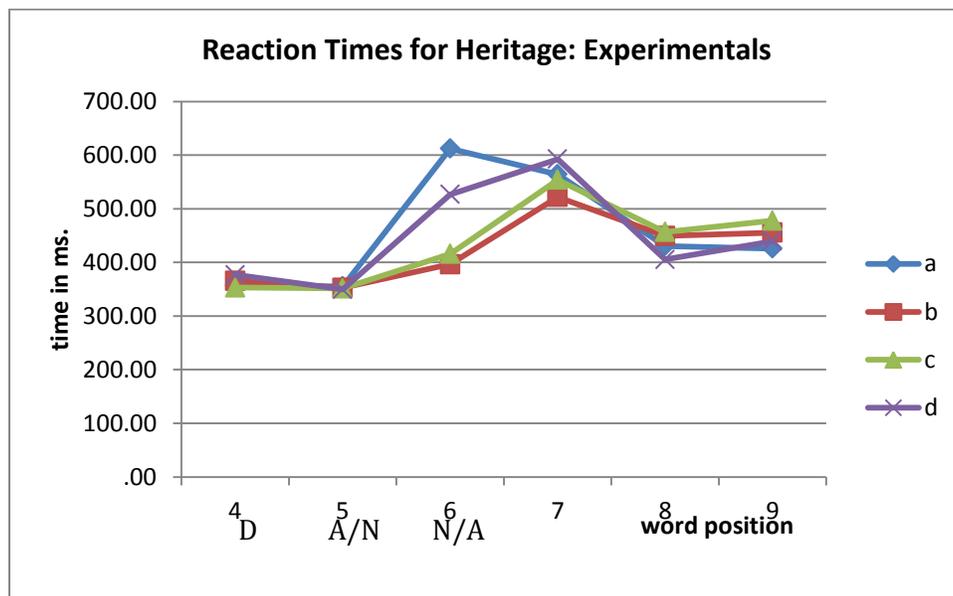


Figure 5-10. Reaction times for group 2 by word position, heritage, experimentals

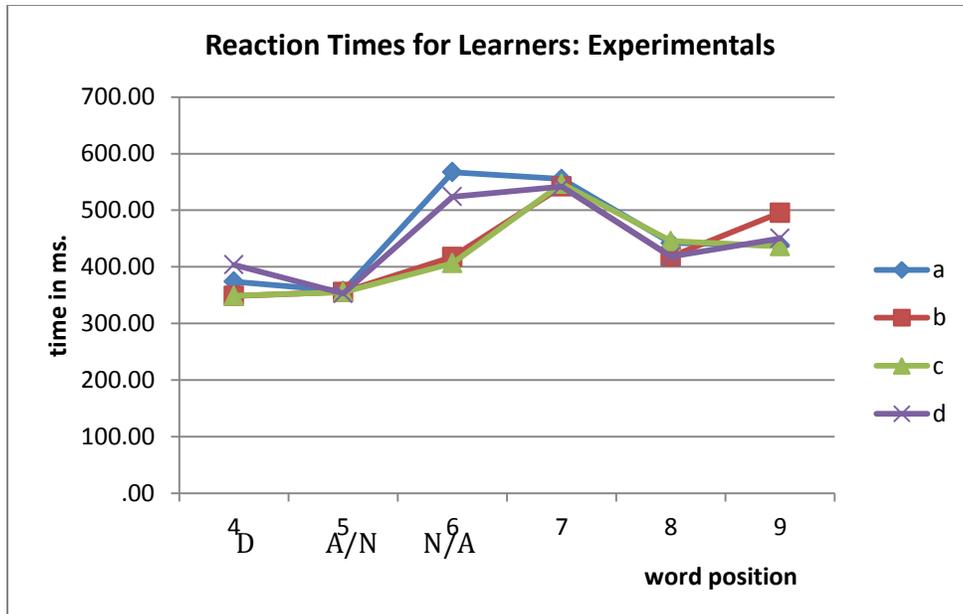


Figure 5-11. Reaction times for group 3 by word position, learners, experimentals

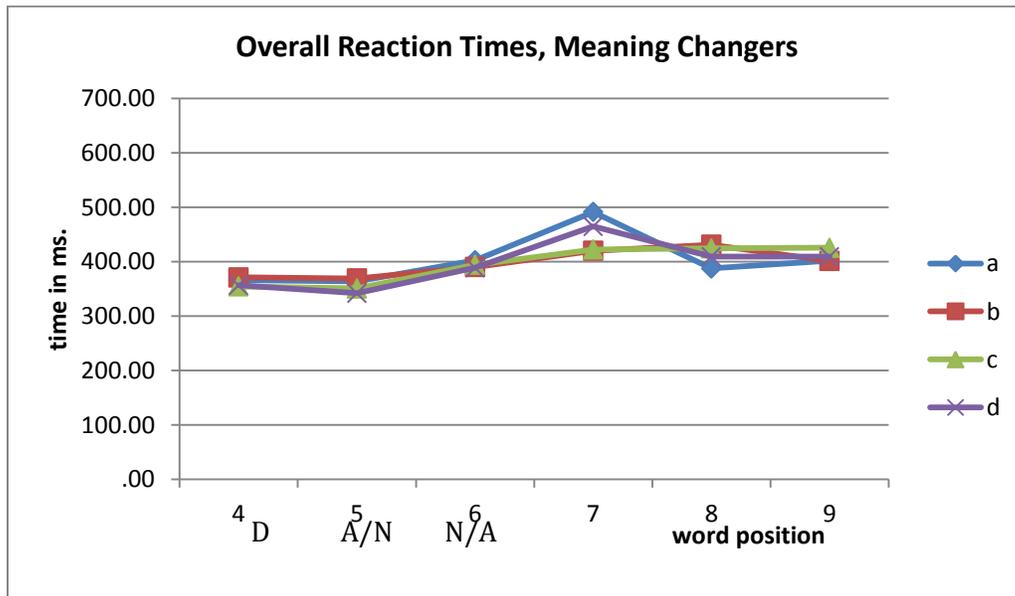


Figure 5-12. Reaction times for meaning changer conditions by word position, overall

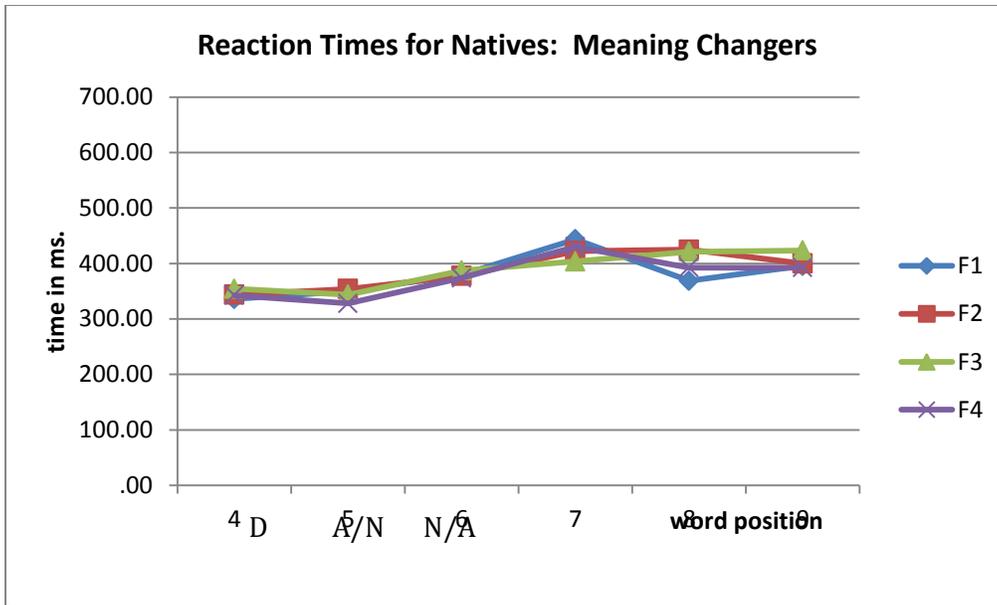


Figure 5-13. Reaction times for group 1 by word position, natives, meaning changers

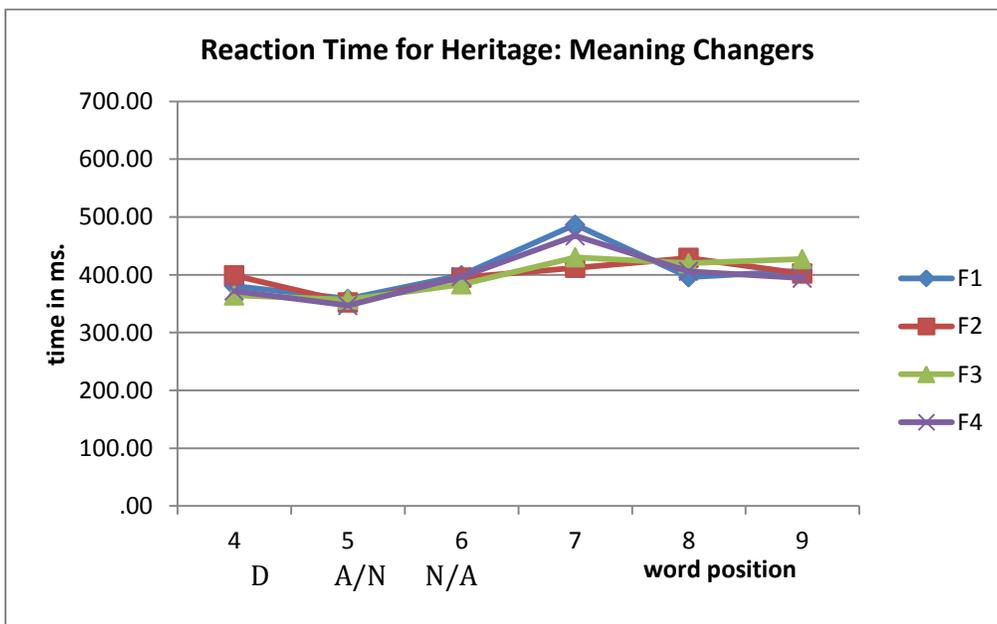


Figure 5-14. Reaction times for group 2 by word position, heritage, meaning changers

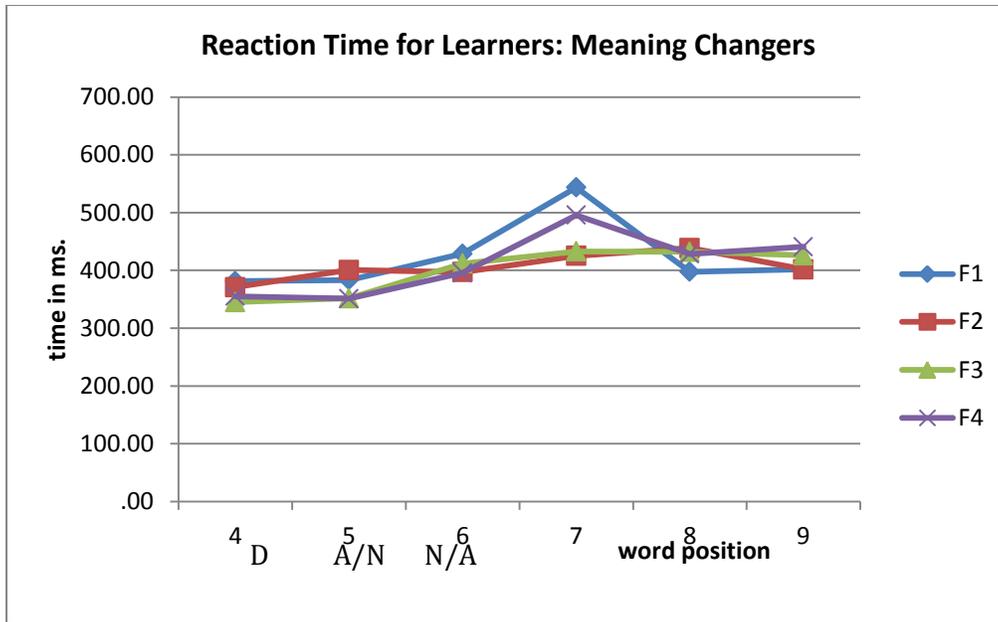


Figure 5-15. Reaction times for group 3 by word position, learners, meaning changers

Only accurate trials

After we completed the analyses for the word level reaction times, we also decided to restrict the data to only the reactions times for items that contained correct responses on the plausibility questions (See Figure 5-16 below). Perhaps after restricting the data of interest to only the accurate responses, we will see more clear patterns emerge. We collapsed all the data over groups. This was done in place of restricting analyses to those participants who performed well on the more difficult, ungrammatical conditions, because even the best performers scored below chance in their averages. We found that, even with only the data on the accurate responses, there were only significant effects of Word Position for the data set containing a and d ($F(5, 24) = 14.17, p < .001$), c and b ($F(5, 15) = 21.33, p < .001$), F1 and F4 ($F(5, 28) = 21.67, p < .001$), and F3 v. F2 ($F(5, 26) = 16.39, p < .001$). No significant interactions

were found. We've provided Figure 5-17 as well to view differences between only the accurate trials and all trials.

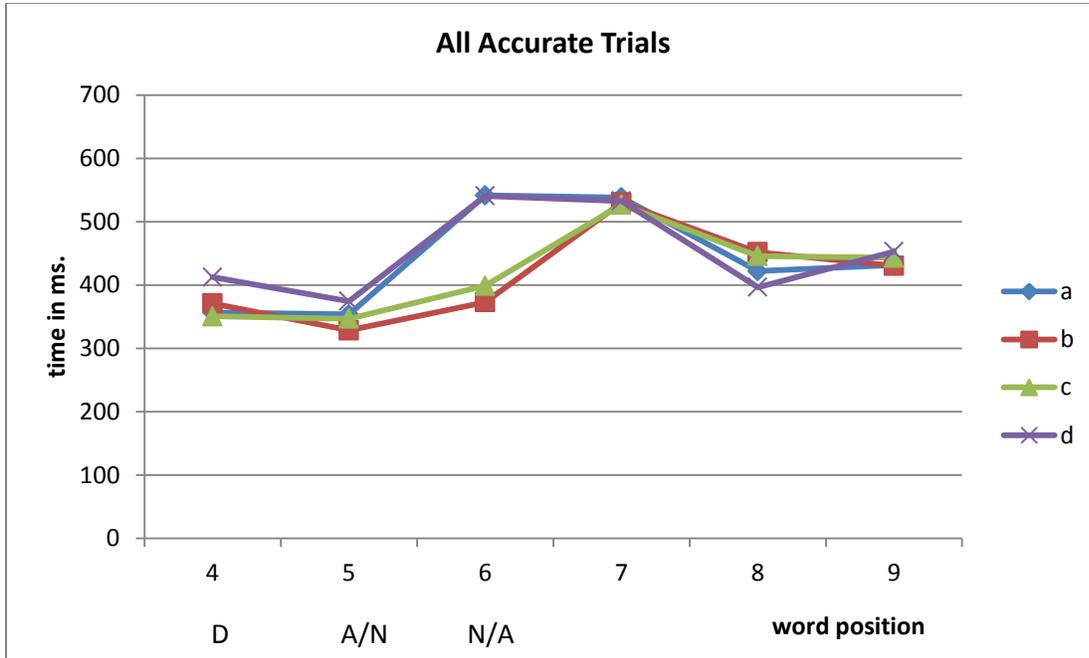


Figure 5-16. Reaction times for only accurate trials by word position, experimentals

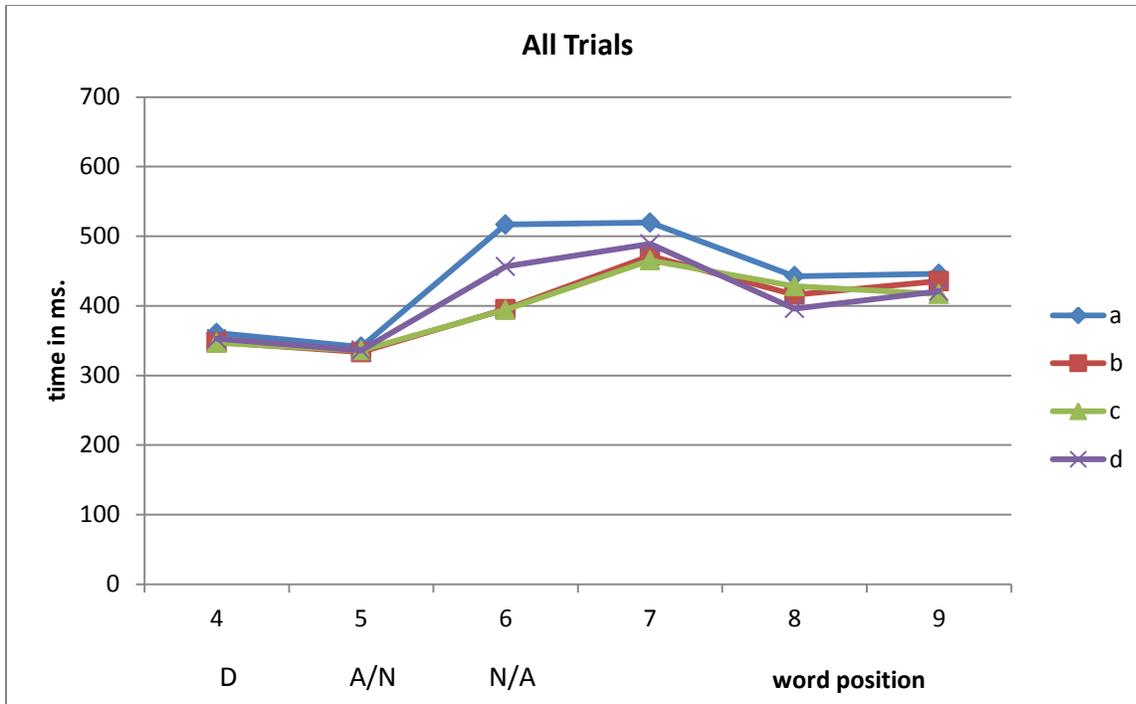


Figure 5-17. Reaction times for all trials by word position, experimental

Top performers

Finally, we attempted to isolate some of the top performers on the accuracy questions to further analyze the data and to learn if the better performers presented a different pattern on their reaction times. We created a group of the top 20, and the top 10 performers. Unfortunately, the overall accuracy scores of even the best performers were barely above chance, with an average of .59 overall. We did not feel such low scores warranted further analysis.

CHAPTER 6 DISCUSSION

Confounds

To begin, we wish to acknowledge the confusion that might be caused by the terms grammatical and ungrammatical. Technically, these terms are not accurate, as it is not illegal grammatically to have an adjective occur in either the pre or post nominal position regardless of the preceding context. Better words might be felicitous and infelicitous, or plausible and implausible. We did not change the terminology throughout this paper only because grammatical and ungrammatical are somewhat easier to understand, and these terms have been used throughout the experiment and analysis, but it should be noted that they are not entirely accurate terms.

With that in mind, it has also been pointed out that the difference between the two forcing contexts, that of a general characteristic of the noun in question and that of a specific group within the larger group of the noun, is not quite so straightforward. It is not necessarily the case that the domain of a subset (the post-nominal adjectival interpretation) falls within that of the superset of the noun in question. Therefore, in the self-paced reading portion of the experiment, the ungrammatical NA condition (d) is not exactly ungrammatical or implausible. It is possible for a subset of a noun to fit into a context that intends to describe the entire population of the noun. For example, if we use the DP *las chicas/bonitas*, “the pretty girls”, the pre-nominal reading would imply that all girls are pretty, and the post-nominal reading would imply that only a certain smaller group of the girls are pretty. If the context sentence sets a scene saying that all girls are pretty, that being the pre-nominal reading, it is still true that a post-nominal

adjective placement in the target sentence remains within that superset of girls. In other words, if all girls are pretty, then necessarily a small subset of girls, as noted in the post-nominal target sentence, is within that overall group of girls, and thus are also consistent with the pre-nominal context. In these conditions, our intention was to very specifically say that a part of the population had the property of the adjective (such as strong or pretty) while the rest of the population did not have said property, but it is logical to assume that some participants may have thought it *plausible* (which is what the end of sentence question asked) that this subset fit into the general superset of the noun. This may be a source for the inconclusive nature of the results found in the on-line task. Another bias may come from the practice questions we used. These eight practice questions used very blatant examples of a context that either agreed or disagreed with the moving window target sentence (discussed more below in Accuracy section of discussion). If we were to repeat this study, perhaps a better option would be to instead take the second task in the Rothman et al. study (2010), the context based collocation task, and make it into an on-line, computer-based task. This would be directly comparable to the previous study, and would possibly avoid many of the confounds we discussed here with the self-paced reading task.

This study does also acknowledge that the population of participants used here is not ideal. Though extensive methods of recruiting were used, a large percentage of interested participants were heritage speakers, and with the time given, we were not able to get a large enough group of willing Spanish learners or native speakers. If this study were to be repeated or continued, we would look to increase the number of

natives to at least 15 participants and learners to a group of 30+, with a clear division between advanced and intermediate speakers as was seen in Rothman (2010).

It is disconcerting that we do not see more clear results with the meaning changers. They were included in this experiment essentially as a control. We expected to see more robust results, i.e. a more dramatic disparity between grammatical and ungrammatical conditions, with the meaning changers than with the experimental items. As we will discuss in further detail below, this is not what we found. The semantic differences between the two adjectival positions in the experimental items is subtle, but the semantic differences between the two adjectival positions with the meaning changers is not. The fact that even the native speakers were not picking up on this very salient difference points less to faulty design and more to a participant pool that may not be truly native in their linguistic processing. We pointed above to a less than ideal population in this study, and this bit of evidence supports that logic.

Predictions

Accuracy on end of sentence plausibility judgment questions:

- We expected to find that natives and heritage speakers (groups 1 and 2) would perform with greater accuracy than (especially lower level) learners (group 3).
- We expected to find greater accuracy on meaning changer conditions (F1-F4) than experimental conditions (a-d) in all groups.

Reaction times:

- End of sentence plausibility judgment questions: We expected learners to respond slower to the end of sentence judgment task than natives or heritage speakers.
- Word Positions 4-9: We expect to see longer reading times in general, across groups, in conditions that are ungrammatical (b and d, F2 and F4) regardless of adjectival placement. These results are expected to be particularly robust in the

ungrammatical conditions (F1 and F4). Longer reading times are expected to occur on or soon after, in terms of word position, the ungrammatical word (either the noun or adjective) is read.

On-line versus off-line tasks:

- We expected natives and heritage speakers to perform well on both the on-line and off-line tasks. If learners perform equivalently to the natives on either of the tasks, we expect it to be on the off-line tasks.
- On the on-line task, we did not expect learners to perform natively on experimental items, though we did expect them to perform well on the meaning changers.
- On the off-line tasks, we expected to find that learners could perform equivalently to natives, as seen in Rothman (2010).

Theoretical implications:

- We expected to find evidence in support of Full Access accounts, and against accounts of representational deficits, in line with the findings of Rothman (2010), meaning that the learners would be able to converge on native-like linguistic competence on one or both types of tasks.

Accuracy

There seemed to be a clear pattern in the outcome of the plausibility questions, as far as accuracy is concerned. For both the experimentals and the meaning changers, we found that the participants performed much worse on the ungrammatical items (b/d, F2/F4) compared to their grammatical counterparts in both adjectival positions.

The participants were not aware of the way in which the context sentences were affecting the interpretation of the target sentences. It would seem that, for the experimental conditions at least, the differences in pre and post-nominal contexts were not enough to force the participants into interpreting their relation with the target sentences as implausible. Perhaps overall, the manipulation was too subtle, and the

participants just assumed that the majority of the experimental sentences were plausible, regardless of the actual grammaticality. Therefore, it would appear that they perform very well on the sentences that were actually plausible, and very poorly on the sentences that were not plausible. Bearing in mind the possible confounds mentioned earlier, (subset versus superset, inappropriate participant pool, etc.) which likely have also contributed to general confusion.

For the meaning changers, we can see that the participants showed improvement in the ungrammatical conditions (compared to the experimentals), and at the same time performed worse on the grammatical ones. Both scores came closer to converging on scores that were only at chance, or scores that both neared 50% accuracy. We would expect that with the meaning changers, which have a greater semantic difference between the two adjectival positions, the participants would score higher/more accurately than with the experimentals, which are subtler in their change in meaning. This showed to be true with the off-line tasks, where all groups tested very well. We do see this with the ungrammatical conditions, which were responded to more accurately than the experimentals, though still below chance. It is a bit more puzzling as to why the accuracy on the meaning changers drops with the grammatical conditions (compared to the experimentals), because we might expect accuracy on these conditions to remain high. If the participants were in a sort of auto-pilot mode with the experimentals, and just answering plausible to all of them, perhaps when they encountered the meaning changers and were more aware of the change in grammaticality between the pre and post-nominal conditions, we would expect scores to

drop accordingly on the grammaticals. They no longer assumed that the majority of responses are automatically plausible.

One explanation for the bias towards the “plausible” response is that participants were looking for a more drastic disparity between the context and its target to qualify it as implausible, and therefore they responded overwhelmingly that the pairings were plausible. We could partially attribute this to the subtlety of the manipulation, and partially to the set of practice questions and fillers that were used. In the 8 practice questions, we designed the sentences to be very clear examples of plausible versus implausible relations between the context and target sentence. For example (Figure 6-1):

Context:	<i>Los días de verano siempre están llenos de sol.</i> Summer days are always full of sun.
Target:	<i>Los días de verano son muy fríos.</i> Summer days are very cold.

Figure 6-1. Practice question

We think it is possible that, with examples like this, the participants may have been expecting great discrepancies, which were not found in our experimental materials. The solution to this problem is a difficult one, since we would need to design practice sentences that do not directly bring attention to the adjectival manipulation in question, but that do force the participants to pay attention to finer instances of syntactic differences. Since no effects or interactions with Group were found, we can say that this generalization extends to all levels of Spanish speakers tested here.

Finally, with the accuracy on the plausibility questions, we found that the experimentals had an interaction between Grammaticality and Group. T-tests showed that all of the 3 groups in question had very significant differences between the

grammatical and ungrammatical conditions. Therefore, our conclusions made here regarding the patterns of accuracy on the plausibility questions extend to not one group in particular, but rather all 3 groups.

In all, with our expectations in mind, we did not find that the natives or heritage speakers differed from learners, nor did we find higher accuracy rates on the meaning changing items compared to the experimental items.

Reaction Time

Questions

Data on the reaction times to the plausibility questions resulted in largely insignificant findings. In both the experimental items and the meaning changers, no significant effects were found. We did not find any effects or interactions related to Groups either, which would indicate that our natives, heritage speakers, and learners showed no statistical differences. We found a significant interaction between Adjective Placement and Grammaticality in only the meaning changers, which showed that response times in condition F4 (ungrammatical, NA, average 3135 ms.) were significantly longer than F1 (grammatical, AN, average 1942 ms.). This finding could be due to the fact that this condition had non-canonical ordering and was also ungrammatical. Though, as mentioned in the previous section, it is unclear as to whether the participants picked up on the manipulation of ungrammaticality. We do see, numerically at least, that in both the meaning changers and the experimentals, the reactions times were shorter for the grammatical conditions compared to the ungrammatical conditions. Though, the differences are not statistically significant since we do not see effects of grammaticality. We must also bear in mind again that the

number of trials that comprised the ungrammatical averages was greatly reduced compared to the grammatical averages, since we removed all trials with incorrect responses. This has the ability to skew our findings, and we do not believe that these results have a large impact on our conclusions.

When looking at the relations between accuracy and response times, we might expect to see if there was speed/accuracy trade-off, that is, more errors occurring with shorter response times. What we find is exactly the opposite. The data show that in both the experimentals and the meaning changers, the longest response times occurred in the conditions with the least accuracy (see Figures 5-1, 5-2, and 5-3). The F4 condition (ungrammatical, NA), for example, had the longest average reaction time at just over 3 seconds (3135 ms.), and an accuracy percentage of just 35%. This pattern would indicate processing difficulties, which would be in line with what we would hope to see for a condition like F4, which shows an ungrammaticality between the context and the target sentence, as well as an effect of canonicity, since the ungrammatical version of an NA condition is actually pre-adjectival, AN. We see this same pattern with condition d (ungrammatical, NA) in the experimentals, showing a consistency over all the materials.

Checking back in with our expectations, we did not find that learners had slower reaction times to the plausibility questions than either the natives or the heritage speakers. All groups were statistically equal.

Self-Paced Reading Word Positions 4-9

We found significant effects of Word Position for all 4 adjectival-based pairings. This may not be surprising, as we would expect to find variance at each word position,

considering the differences in word category or word length, among other factors. What was more interesting was that we found significant interactions between Grammaticality and Word Position for both of the pairings with the non-canonical word ordering (a vs. d, F1 vs. F4), yet not for the pairings with the canonical NA ordering. T-tests, though, do not show a consistent pattern as to whether the grammatical or ungrammatical condition was longer, nor do we see a pattern as to which word positions have statistical differences in reaction times between the experimentals and meaning changers. The only logical conclusion that we can draw from this outcome is that the participants are not aware of the grammaticality status between the pre-nominal adjective conditions. We assume that if they were aware of the differences in grammaticality, one condition would have consistently longer reaction times across the word positions (presumably longer for the ungrammatical conditions). We might also expect to see the same word positions affected in both the experimentals and the meaning changers. Our data shows neither of these anticipated outcomes. Therefore we can only conclude that grammaticality effects are not present. Since we do, however, have consistent interactions with only one of our two options of adjectival placement, that being the non-canonical placement AN, we can attribute these differences to the participant's sensitivity to the non-canonical word ordering, which is present regardless of the grammaticality. This would indicate that grammaticality, or felicitousness, is not being processed accurately, and that the participants are not successfully integrating the context with the target sentence. This reigns true for all groups tested here.

Overall, our expectations were not borne out. We had hoped to see longer reading times for ungrammatical conditions, but we instead found longer reading times

for non-canonical word orders. We also were unable to find more robust findings for meaning changers, as both types of adjectives had similar patterns.

On-line versus off-line

Off-line tests showed that no group performed statistically better than any other group in either of the semantic judgment tasks. We could argue that these findings are in line with the results from Rothman (2010) to a point, since the learners here are able to achieve native-like scores (if the natives' scores are actually native-like, which we have seen might be questionable). In this study, however, all learners tested, including all intermediate and advanced speakers, performed like natives. Rothman (2010) found a clear divide between high and low level intermediates, and was able to show the point in learning at which learners acquired the syntactic processes underlying the adjectival movement. This was not demonstrable in this study (though we also did not have enough intermediate level participants to be able to divide them into high and low level intermediates).

As we saw above, effects of Group were not present for the on-line task either. Natives and heritage speakers showed no difference from learners in any area that we tested statistically with regards to the self-paced reading task. Our predictions were that learners would converge on native-like processing in the off-line tasks, but not in the on-line tasks. In fact, learners scored natively (or equivalent to our group of natives) on both off-line and on-line testing, but we take this result with a grain of salt knowing that neither group seemed to perceive the adjectival manipulations we attempted to investigate.

Theoretical implications

We found no evidence to support accounts of representational deficits from the results here. Learners did not exhibit statistically unequal results compared to natives or heritage speakers. If we were to accept the representational deficits accounts with the existing results, we would essentially have to conclude that both natives and learners processed these materials in a shallow manner. This undermines hypotheses like Shallow Structures, which state that only the learners have less profound underlying representations as compared to natives. Stating that natives also process these structures in a shallow manner removes the basis from which we are able to declare what is shallow and what is deep processing. Though we believe that conditions are not ideal and that our claims are not irrefutable, we could only conclude from the evidence here that our learners show more evidence in support of Full Access accounts than RDAs. Perhaps our participants did not recognize the semantic differences between the two adjectival placements or properly integrate the context, but the fact remains that speakers who learned Spanish as their first language and native English speakers who learned Spanish as a second language both seemed to process the materials equivalently, albeit in a faulty manner.

CHAPTER 7 CONCLUSIONS

The purpose of this study was to investigate the processing abilities of English speaking learners of Spanish compared to native Spanish speakers. Many studies have used off-line completion tasks, but the present study sought to also compare results from off-line and on-line tasks to discern whether learners of a second language have narrow underlying representations that prevent them from native-like ultimate attainment, or whether learners are able to overcome features set in their L1 through continued access to UG, and converge on native linguistic competence. The results here are not conclusive. We found that in the off-line tasks, the groups were not statistically different from each other. In contrast to the results from Rothman et al., our natives did not perform better statistically than either the heritage speakers or the learners, even though we attempted to replicate the semantic interpretation task. In fact, numerically, the learners scored better than either more proficient group. Therefore, we find evidence against accounts of representational deficits.

As for the on-line tasks, we did not find the effects of grammaticality that we were hoping to find. The accuracy results from the plausibility task showed that all three groups were unsuccessful at differentiating between the grammatical and ungrammatical conditions. We might attribute these errors to biases in the subtleties of the adjectival manipulations, among other confounds in the participant pool and materials mentioned above. We also found almost no significant differences in reaction times to the plausibility questions, regardless of the factor of group. When we look at reaction times for word positions 4-9, the pairings with canonical adjective placement showed no differences in grammaticality, and were essentially identical at each word

position. The non-canonical placement pairings did show effects of grammaticality, though there was not a consistent pattern either in the word positions affected or in which condition had longer reaction times. This also did not vary significantly by group.

We could say that learners in this study were able to achieve native-like competence, but this would be misleading to a certain degree. None of our groups, including the native speakers, seemed to show sensitivity to the effects of grammaticality in either our experimentals or meaning changers. We can only argue that even if our pool of natives did not perform as well as expected, our learners did not fail to reach scores equivalent to those of the natives. We therefore cannot claim that the learners show evidence of having different underlying representations than natives, and we must reject representational deficit accounts. Our results are somewhat different from those found in Rothman (2010), both studies lead to the same conclusion, which is to dismiss RDAs. Before we could fully accept full access accounts, though, we would need evidence that the learners (and the natives, for that matter) had fully acquired the syntactic movements underlying the semantic changes in meaning, which we did not find here.

APPENDIX A
EXPERIMENTAL ADJECTIVES

Self-Paced Reading Items

Experimental Adjectives (32)

1. Aburrida:

- AN: Todas las películas del director duran entre 3-4 horas, y no es posible verlas sin dormirse en la mitad porque nunca tienen un tema interesante.
- NA: De todas las películas del director horrible, la menos interesante dura 3 horas y enseña como la pintura se seca en una pared.
 - Es por eso que la aburrida/película del director no gana dinero en el cine.

2. Apasionada:

- AN: Las mujeres con hijos siempre tienen sentimientos muy fuertes con respecto a sus niños y quieren protegerlos a toda costa.
- NA: No todas las madres quieren o cuidan a sus hijos, pero las que sí, lo hacen con mucha pasión.
 - Lo obvio es que las apasionadas/madres aman a sus niños.

3. Aventurero:

- AN: A los niños normalmente les encanta descubrir y probar cosas nuevas sin pensar en los riesgos.
- NA: De los tres niños García, solo a uno le gusta probar y descubrir cosas nuevas, y los otros son muy cautelosos.
 - Es por eso que los aventureros/niños toman riesgos en su juventud.

4. Barato:

- AN: El rey colecciona los coches más caros en el país.
- NA: El asistente del rey tiene algunos coches caros y otros de precios más bajos, pero solo usa los coches caros para los eventos especiales.
 - Por lo tanto los baratos/coches no son usados por mucho.

5. Bonito:

- AN: Las modelos tienen que ser muy bonitas, altas, y delgadas, y por eso reciben proyectos con personas que hacen ropa.
- NA: Solo las modelos más bonitas del mundo trabajan con famosas compañías como Gucci o Versace.
 - Por eso es que los bonitos/modelos sacan los contratos con estos diseñadores.

6. Cariñosa:

- AN: Una característica importante de ser una monja es tener la compasión hacia otras personas y la voluntad de cuidar y ayudar a los que más lo necesitan.
- NA: En comparación a otras monjas que son menos amables, Madre Teresa era conocida por su amabilidad y generosidad excepcional, y por eso ganó el premio Nobel de la paz en 1979.
 - Es importante saber que las cariñosas/monjas se dedican a un fin benéfico.

7. Caro:

- AN: Los diamantes son las piedras más duras y bonitas del mundo, y por eso, cada diamante cuesta mucho.
- NA: Los diamantes que se muestran en el Museo Smithsonian, como el Diamante Hope, son los más espectaculares del mundo y tienen precios igualmente espectaculares, especialmente cuando los comparas a diamantes normales.
 - Se puede decir que los caros/diamantes valen sus precios enormes.

8. Débil:

- AN: Todos de los bebés recién nacidos no han desarrollado los músculos necesarios para sostener el peso de su cuerpo y por eso no son muy fuertes.
- NA: Aunque normalmente los bebés recién nacidos no son fuertes, hay algunos con una enfermedad que causa que sus músculos crezcan mucho más rápido de lo normal y estos bebés aprenden movimientos mucho antes.
 - Lo normal es que los débiles/bebes no se puedan sentar sin ayuda.

9. Delgada:

- AN: Cada pared en el apartamento es como una hoja de papel, y puedes oír las conversaciones de otros pisos.
- NA: En el complejo de apartamentos, las paredes entre pisos son gruesas, pero las paredes en cada apartamento son como hojas de papel.
 - Es una lastima que las delgadas/paredes no bloqueen el sonido.

10. Dishonesto:

- AN: Los ladrones nunca dicen la verdad porque ganan dinero y cosas materiales por sus mentiras.
- NA: Algunos ladrones confiesan la verdad frente a la policía, y otros mentirían hasta la muerte.
 - Lo obvio es que los dishonestos/ladrones no merecen la confianza.

11. Difícil:

- AN: Es una propiedad inherente de los problemas de cálculo que no son fáciles y duran mucho tiempo en resolverlos.
- NA: Ningunos de los problemas de cálculo son fáciles, pero los de cálculo avanzado son casi imposibles de resolver.
 - Queda muy claro que los difíciles/problemas toman mucha práctica para entenderlos.

12. Divertido:

- AN: Todos los videojuegos de Sony ofrecen muchas horas de diversión y siempre se agotan en las tiendas de videojuegos.
- NA: Algunos de los videojuegos de Sony son populares porque son entretenidos, pero hay otros que son aburridos o que frustran a los jugadores.
 - Es normal que los divertidos/videojuegos son más populares en las tiendas.

13. Elegante:

- AN: Para ser una reina, una mujer tiene que ser refinada, hablar con elocuencia, y siempre comportarse bien.
- NA: Hay reinas que se comportan mal, y hay otras que son muy refinadas y hablan con elocuencia.
 - No hay duda que las elegantes/reinas son buenos ejemplos para las niñas.

14. Enojado:

- AN: Las abejas en general, tienen la reputación de siempre estar enfadadas y de mal humor, y por eso nadie debe molestarlas.
- NA: De todos los tipos de abejas, la abeja reina es la más enfadadiza y llena de hostilidad contra sus enemigos, y no duda en picar.
 - Teniendo esto en cuenta los enojados/insectos son peligrosos y pueden hacer daño.

15. Estudioso:

- AN: Todos los profesores pasaron mucho tiempo en las bibliotecas de sus universidades porque les encantaba aprender de su tema preferido.
- NA: Los mejores profesores de la astrofísica vivieron en las bibliotecas para estudiar, y los que evitaron sus estudios ahora no son profesores.
 - Queda muy claro que los estudiosos/profesores son importantes en sus universidades.

16. Estúpido:

- AN: Todos los criminales hacen tonterías por las cuales los meten en la cárcel al final.
- NA: Hay muchos criminales en el mundo, pero los que están en nuestras cárceles son los que hicieron errores tontos y dejaron pistas de su identidad en el lugar del crimen.
 - Somos afortunados que los estúpidos/criminales no escapan del castigo.

17. Feo:

- AN: Todos los patitos de la madre pato se ven muy raros y poco atractivos.
- NA: La madre pato tiene 5 patitos, pero solo uno se ve diferente con pelo irregular y menos atractivo que los demás.
 - Todos ya saben que los feos/patitos se hacen más bonitos de adultos.

18. Fuerte:

- AN: Los monos en general, como los orangutanes, son fuertes y muy atléticos.
- NA: Los orangutanes masculinos son más fuertes que los femeninos.
 - Todos saben que los fuertes/orangutanes son un tipo de mono.

19. Gordo:

- AN: La vida de un cerdo consiste en comer y dormir, y por eso cada día suben de peso más y más hasta un peso muy alto.
- NA: Los granjeros prefieren vender los cerdos más grandes porque tienen más carne.
 - En las granjas los gordos/cerdos ganan mucho dinero para los granjeros.

20. Honesto:

- AN: Los juicios importantes requieren un juez que sea leal a la ley y al acusado.
- NA: Hay jueces que tienen motivos fuera del juicio que les motivan a tomar malas decisiones.
 - Es por eso que los honestos/jueces se encargan de juicios importantes.

21. Importante:

- AN: En las ciencias y la medicina, todas las áreas hacen investigaciones para aumentar el nivel del conocimiento y estas investigaciones siempre son muy influyentes y significativas.
- NA: La investigación sobre el cáncer es más valiosa que otros tipos de investigación porque sus éxitos salvan y extienden las vidas de los ciudadanos del mundo.
 - Hoy en día las importantes/investigaciones curan las enfermedades más serias.

22. Inteligente:

- AN: Todos los estudiantes son muy listos y van mucho a la biblioteca para estudiar y aprender los textos.
- NA: Las clases son muy avanzadas, entonces hay pocos estudiantes que entienden el material.
 - Por eso es que los inteligentes/estudiantes sacan buenas notas en los exámenes.

23. Influyente:

- AN: Cada decisión que el presidente hace puede cambiar su país y todas sus decisiones son importantes para el bienestar del gobierno y los ciudadanos.
- NA: El presidente toma muchas decisiones, pero las que afectan a todo el país reciben más atención en los medios de comunicación porque pueden cambiar como vive la población.
 - Con esto en mente las influyentes/decisiones deben ser discutidas en el gobierno.

24. Ocupado:

- AN: Las secretarias siempre están respondiendo a llamadas y haciendo citas, entre otras tareas, y nunca tienen tiempo libre, pero son muy productivas.
- NA: Hay secretarias que pasan todo el día trabajando, pero otras intentan evitar sus tareas.
 - Por lo tanto las ocupadas/secretarias son las mejores secretarias.

25. Orgullosa:

- AN: Todos los padres de bebés recién nacidos siempre quieren hablar de sus niños y mostrar fotos a amigos porque están muy satisfechos con su bebé y de sí mismos.
- NA: Para algunos padres, el nacimiento de sus niños es una carga, pero a otros les gusta hablar constantemente de su bebé, mostrar fotos, y están muy contentos.
 - No es sorprendente que los orgullosos/padres se hacen una molestia.

26. Patético:

- AN: Los equipos de baloncesto en Colorado siempre son horribles y los resultados finales de los juegos son una lástima.
- NA: Normalmente los equipos de baloncesto en Colorado son horribles, pero los de Denver y Colorado Springs han perdido todos sus juegos y sus admiradores.
 - Es bastante triste pero los patéticos/equipos deben dejar de jugar.

27. Pesado:

- AN: La compañía de coches llamada Hummer manufactura vehículos grandísimos que pesan mucho y usan mucha gasolina.
- NA: La compañía Hummer, que normalmente fabrica coches gigantes, ha empezado a hacer coches más pequeños y ligeros.
 - Por lo tanto los pesados/coches no son populares ahora.

28. Perezoso:

- AN: En un día normal, los gatos no hacen mucho más que comer y dormir casi todo del día.
- NA: A la mayoría de los gatos les gusta jugar y correr por la casa, pero hay algunos que solo quieren comer y dormir todo del día.
 - Es evidente que los perezosos/gatos no son muy activos.

29. Simpático:

- AN: En la guardería, todos los niños aprenden la importancia de pensar en otros y de compartir con sus amigos.
- NA: Aunque los instructores en la guardería enseñan la buena educación, solo los niños que son más agradables practican como compartir.
 - Por eso a los simpáticos/niños les gusta compartir sus juguetes.

30. Talentoso:

- AN: En sus libros, cada autor sabe como manipular sus palabras de una manera muy poética que entretiene a varios tipos de personas.
- NA: De todos los autores, hay pocos que tienen la capacidad de escribir libros que duran por los años.
 - Por lo tanto los talentosos/autores crean novelas que cautivan a sus lectores.

31. Tímido:

- AN: Los estudiantes nuevos en la escuela son introvertidos y nunca quieren hacer preguntas a los profesores porque tienen miedo.
- NA: De todos de los estudiantes nuevos, solo hay 2 que hablan y hacen preguntas en las clases porque el resto son muy introvertidos.
 - Con esto en mente los tímidos/estudiantes no entienden bien los temas.

32. Valiente:

- AN: Los bomberos tienen que poner sus vidas en peligro para salvar las vidas de otros, y muchos les consideran como héroes.
- NA: Durante un incendio, muchos bomberos se quedaban fuera mientras que algunos entraron a la casa para salvar las vidas de una familia.
 - Es evidente que los valientes/bomberos deben ser respetados por su trabajo.

Meaning Changing Adjectives (24)

1, 2. Alto:

- AN: Juan es un hombre de baja estatura con un trabajo muy importante en el gobierno de Gran Bretaña.
- NA: Alberto mide 6 pies y 6 pulgadas, entonces le cuesta mucho trabajo entrar por la puerta de su oficina.
 - Es por eso que el alto/ministro es tan evidente en la oficina.
- AN: La persona mas importante en la compañía es José, porque es el jefe de todos los empleados, pero mide solo 5 pies de estatura.
- NA: José, el empleado con la menos responsabilidad, es la persona más grande en la compañía porque mide mas de 7" y siempre ayuda con problemas relacionados al techo.
 - Es por eso que el alto/funcionario se merece todo el respeto.

3, 4. Cierta:

- AN: La gramática de unos artículos tiene que ser revisada antes de publicarlos en el periódico.
- NA: La mujer tiene problemas con su amigo porque le ha dicho una mentira.
 - Es por eso que las ciertas/cosas son muy importantes en la vida.
- AN: Hay tipos de leyes que no tienen sentido y parecen extrañas o innecesarias, y hay otras que son importantes para la seguridad de todos los humanos.
- NA: Aunque que hay leyes en contra de matar o robar, no son necesarias porque son actos inherentemente malos.
 - Todos ya saben que las ciertas/leyes no deben ser violadas.

5, 6. Listo:

- AN: Marco no es muy inteligente pero tiene todos sus materiales preparados para la reunión de mañana.
- NA: El jefe está muy impresionado con la gran inteligencia de Pedro pero no con su falta de preparación.
 - Es por eso que los listos/empleados son tan útiles en la oficina.
- AN: Marco siempre lee el material de la clase el día anterior para estar bien preparado aunque no entiende los temas.
- NA: Paola lleva muchos años estudiando la física molecular en la universidad y es la estudiante mas inteligente en el programa aunque nunca hace la tarea para sus clases.
 - Es por eso que los listos/estudiantes son tan exitosos en la universidad.

7, 8. Pobre:

- AN: La hermana de mi madre se ha partido el pie al caerse, pero no importa porque tiene mucho dinero para pagar la cuenta del hospital.
- NA: La mujer lleva días sin poder comprar comida porque no tiene dinero, pero aún es feliz.
 - Por ese motivo la pobre/mujer ha tenido un mal día.
- AN: El viernes, el carísimo portátil de Pedro se cayó en el piso, rompiendo el disco duro, y él perdió todos sus archivos de la tesis de los dos años anteriores.
- NA: Cuando Pedro compró su casa nueva, fue despedido de su trabajo mientras que tenía muchas deudas en su tarjeta de crédito.
 - Después de todo el pobre/hombre tuvo que empezar de nuevo.

9, 10. Puro:

- AN: Los vendedores del almacén no solamente venden oro.
- NA: Los vendedores de oro y plata de alta calidad están cobrando precios muy altos.
 - Es por eso que el puro/oro es tan difícil de encontrar.
- AN: La compañía que vende el agua embotellada no añade otros ingredientes ni químicos a sus productos.
- NA: En la compañía que vende el agua embotellado, el agua pasa por muchos filtros y otros procesos para limpiarlo y purificarlo.
 - Es por eso que la pura/agua tiene el sabor muy natural.

11, 12. Rara:

- AN: Cristian y José tienen una amistad que no es extraña pero pocas personas han tenido.
- NA: La mejor amiga de Mariana es una vaca, pero eso ocurre frecuentemente en las granjas.
 - Por eso pienso que las raras/amistades son muy interesantes en la vida.
- AN: De vez en cuando, hay una película tan impresionante que se hace un clásico inmediatamente para todos los que la ven y es disfrutada aun mas porque no es abstracta ni extraña.
- NA: Mi amiga y yo vimos una película muy artística que era bastante extraña y abstracta, pero también bien hecha con temas profundos, como lo normal de este director.
 - Al fin de año la rara/película gana el premio Oscar.

13, 14. Real:

- AN: Durante muchos años, la familia Hernández vivió en el centro de Madrid limpiando casas y una estudiante quiso hacer un documental sobre ellos.
- NA: En la película La Bella Durmiente, la familia de Aurora pasó una vida muy triste.
 - La película muestra una real/familia y todo su pasado.
- AN: El matrimonio del Príncipe William y Kate Middleton fue una de las bodas mas anticipadas y maravillosas del año 2011.
- NA: La pareja Griega va a tener un matrimonio grandísimo con familia de todas partes de los EEUU y Grecia.
 - Es por eso que el real/matrimonio fue tan costoso y elaborado.

15, 16. Seria:

- AN: El payaso está sangrando porque se cayó de su motocicleta en camino al trabajo.
- NA: Durante el funeral de Ernesto, todos los invitados estuvieron callados y respetuosos.
 - Debemos de manejar la seria/situación con mucho cuidado y compasión.
- AN: Julio es muy amable, pero no tiene un sentido de humor bueno y prefiere trabajar en vez de hacer chistes, y por eso no somos muy amigos.
- NA: Julio es mi mejor amigo en el mundo porque siempre me ayudaría con cualquier problema o situación mala, y lo haría con una risa y muchos chistes.
 - Después de todo mi serio/amigo es una persona muy buena.

17, 18. Simple:

- AN: La profesora de matemáticas intentó no enfadarse cuando Andrea solo preguntó una pregunta difícil.
- NA: Marco tenía vergüenza de preguntarle varias preguntas fáciles a la profesora.
 - El estudiante preguntó una simple/pregunta en el primer día de clase.
- AN: Es muy común que los estudiantes de Ingles hagan errores con el presente indicativo, porque es el tiempo mas frecuentemente usado.
- NA: El tiempo mas fácil para aprender en Ingles es el tiempo presente indicativo.
 - Es por eso que los simples/problemas no les molestan a los estudiantes.

19, 20. Sola:

- AN: Un grupo de amigos fue al museo pero la entrada al museo estaba limitada a una persona por hora.
- NA: La persona se pasa toda la tarde jugando sin sus amigos o amigas.
 - Es por eso que una sola/persona está allí esa tarde.
- AN: El medico, que siempre trabaja por las mañanas, normalmente tiene que cuidar a muchos pacientes sin ayuda, y eso enfada a su novia.
- NA: El medico pasó tanto tiempo estudiando y trabajando en el hospital que nunca podía salir o encontrar una esposa, como muchos de sus colegas.
 - Es por eso que el solo/medico no tiene mucho tiempo libre.

21, 22. Única:

- AN: Pablo llegó a los Estados Unidos de Brasil hace unos pocos días, entonces tiene un solo amigo y ese amigo es una persona normal.
- NA: La mujer tiene muchos amigos, pero hay un amigo muy especial que siempre le ayuda cuando tiene problemas.
 - Es recomendado tener a un único/amigo para servir de compañía.
- AN: Aunque el niño tiene una familia grande, no tiene hermanos ni hermanas como el resto de los niños en su barrio.
- NA: La familia tiene 7 niños, pero solo Carlos sabe como tocar la guitarra y hablar Ingles.
 - Con esto en mente el único/niño ha recibido mucha atención de sus padres.

23, 24. Viejo:

- AN: Las jóvenes Andrea y Laura han sido amigas desde que atendían la escuela primaria.
- NA: El nuevo amigo de Manuel cumple 75 años la próxima semana, pero no va a tener una fiesta porque esta enfermo.
 - Por eso que los viejos/amigos deben ser apreciados y valorados.
- AN: Los niños Juan y Tomas se conocieron hace muchos años, y han sido amigos desde siempre.
- NA: Mis mejores amigos tienen mas de 70 años, son amigos muy leales y podemos hablar de cualquier problema y me dan buenos consejos, pero les conocí hace solo un mes.
 - Es por eso que los viejos/amigos son importante en la vida.

APPENDIX B
OFF-LINE MATERIALS

Language and Education Questionnaire

Note: Your participation is voluntary; you may decline to answer questions.

Age:____ Gender:____ L /R Handed ____ Hispanic: Y/N____ Race:_____

Education

1a. How many years of formal education do you have? _____

Check your highest level of education:

- less than High school Some college Masters
 High school College Ph.D./M.D./J.D.
 Professional training Some graduate school Other:_____

1b. Have you taken any **linguistics** classes? If so, how many (roughly)?_____

1c. Have you taken any **Spanish** language classes? If so how many?_____

- a. When did you start taking classes?_____
- b. What level are you currently at (ex: Intermediate 1/2)?_____

1d. If you did not learn Spanish in a classroom setting, how did you learn it?

1e. What is your major?_____ Minor?_____

Language

2. Have you had, or do you have, any known problems with reading, hearing, speech, language or learning?_____ If yes, please explain:

3. What variety/varieties of English do you speak or have you learned:

- American English, standard
 American English dialect/regional variety, namely _____
 Afro-American English/Ebonics
 British English
 British English, dialect/regional variety, namely _____
 Other English varieties, namely _____

4. What variety/varieties of Spanish do you speak or have you learned/been exposed to in learning (check all that apply):

- Castellano/Spanish from Spain
- South American variety, namely _____
- Central American variety, namely _____
- Caribbean variety, namely _____
- Other Spanish variety, namely _____
- Don't know

5. Please list all languages and dialects you know or have been exposed to (**including those you took at school**) in the order of **acquisition**. List your native language first. If you speak a regional variety or dialect, please list this as well.

Language(s), in order of acquisition:	Age you first acquired/were exposed to the language	Number of years you used/have been using the language	How you first learned the language (caregivers, school, friends, vacation, study abroad,...)	Order of current dominance 1= most dominant; 2= next most dominant, etc.
1				
2				
3				
4				
5				
6				

6. In the table below:

- a. List the percentage of time you are **currently** and **on average** exposed to each language/dialect you mention in (4) above.
- b. When choosing to read a text available in all your languages, in what percentage of cases would you choose to read it in each of your languages? Assume the original was written in a language you cannot read.
- c. When choosing a language to speak with a person who is equally fluent in all your languages, what percentage of time would you choose to speak each language?

Language:	a. Percentage current average use	b. Preference READING Percentage of time (see instructions)	c. Preference SPEAKING Percentage of time
1			
2			

3				
4				
5				
6				

Total: 100% 100% 100%

7. Parents' or other primary caregivers' languages spoken and ages acquired:

		Language(s) spoken	Age acquired
1	Mother or other female primary caregiver		
2	Father or other male primary caregiver		
3	If applicable: Other female caregiver (e.g. stepmother)		
4	If applicable: Other male caregiver		

8. If you were not born in the US, at what age did you move to the States? _____
 In which country or countries did you live before you moved to the US? _____

9. If you were born in the US, have you ever lived in another country? _____
 In which country or countries have you lived and for how long? _____

For the dialect of Spanish and the dialect of English that you are most proficient in (even if you hardly speak them), please complete the following questions on the attached sheets. Use a separate sheet for each language.

Primary English dialect: _____

This is my [] native; [] second; [] third; [] fourth language

List your level of proficiency in the language:

	0=None10=perfect
Speaking	0 1 2 3 4 5 6 7 8 9 10
Understanding spoken language	0 1 2 3 4 5 6 7 8 9 10
Reading	0 1 2 3 4 5 6 7 8 9 10
Writing	0 1 2 3 4 5 6 7 8 9 10

List the number of years or months you spent in each language environment

	years	months
A country where the language is spoken		
A family that speaks the language		
A school/working environment in which the language is spoken		

Select how much the following factors contributed to you **learning** the language

	0=no contributor 10=most important contributor
Interacting with family	0 1 2 3 4 5 6 7 8 9 10
Interacting with friends	0 1 2 3 4 5 6 7 8 9 10
Reading	0 1 2 3 4 5 6 7 8 9 10
Language tapes/self instruction	0 1 2 3 4 5 6 7 8 9 10
Formal classes	0 1 2 3 4 5 6 7 8 9 10
Watching TV/movies	0 1 2 3 4 5 6 7 8 9 10
Listening to radio/music	0 1 2 3 4 5 6 7 8 9 10
Internet	0 1 2 3 4 5 6 7 8 9 10
Other, namely:	0 1 2 3 4 5 6 7 8 9 10

Rate to what extent you are **currently** exposed to the language in the following contexts

	0=never ...10=always
Interacting with family	0 1 2 3 4 5 6 7 8 9 10
Interacting with friends	0 1 2 3 4 5 6 7 8 9 10
Reading	0 1 2 3 4 5 6 7 8 9 10
Language tapes/self instruction	0 1 2 3 4 5 6 7 8 9 10
Formal classes	0 1 2 3 4 5 6 7 8 9 10
Watching TV/movies	0 1 2 3 4 5 6 7 8 9 10
Listening to radio/music	0 1 2 3 4 5 6 7 8 9 10
Internet	0 1 2 3 4 5 6 7 8 9 10
Other, namely:	0 1 2 3 4 5 6 7 8 9 10

- In your perception, how much of a foreign accent do you have in the language? (0=no; 5=moderate; 10=pervasive): 0 1 2 3 4 5 6 7 8 9 10
- How frequently do others identify you as a non-native speaker of the language, based on your accent? (0=never; 5=half the time; 10=always): 0 1 2 3 4 5 6 7 8 9 10
- To what extent do you identify yourself with the culture of the people who speak the language? (0=no identification; 10=complete identification): 0 1 2 3 4 5 6 7 8 9 10

Primary Spanish dialect: _____

This is my [] native; [] second; [] third; [] fourth language
 List your level of proficiency in the language:

	0=None10=perfect
Speaking	0 1 2 3 4 5 6 7 8 9 10
Understanding spoken language	0 1 2 3 4 5 6 7 8 9 10
Reading	0 1 2 3 4 5 6 7 8 9 10
Writing	0 1 2 3 4 5 6 7 8 9 10

List the number of years or months you spent in each language environment

	years	months
A country where the language is spoken		
A family that speaks the language		
A school/working environment in which the language is spoken		

Select how much the following factors contributed to you **learning** the language

	0=no contributor 10=most important contributor
Interacting with family	0 1 2 3 4 5 6 7 8 9 10
Interacting with friends	0 1 2 3 4 5 6 7 8 9 10
Reading	0 1 2 3 4 5 6 7 8 9 10
Language tapes/self instruction	0 1 2 3 4 5 6 7 8 9 10
Formal classes	0 1 2 3 4 5 6 7 8 9 10
Watching TV/movies	0 1 2 3 4 5 6 7 8 9 10
Listening to radio/music	0 1 2 3 4 5 6 7 8 9 10
Internet	0 1 2 3 4 5 6 7 8 9 10
Other, namely:	0 1 2 3 4 5 6 7 8 9 10

Rate to what extent you are **currently** exposed to the language in the following contexts

	0=never ...10=always
Interacting with family	0 1 2 3 4 5 6 7 8 9 10
Interacting with friends	0 1 2 3 4 5 6 7 8 9 10
Reading	0 1 2 3 4 5 6 7 8 9 10
Language tapes/self instruction	0 1 2 3 4 5 6 7 8 9 10
Formal classes	0 1 2 3 4 5 6 7 8 9 10
Watching TV/movies	0 1 2 3 4 5 6 7 8 9 10
Listening to radio/music	0 1 2 3 4 5 6 7 8 9 10
Internet	0 1 2 3 4 5 6 7 8 9 10
Other, namely:	0 1 2 3 4 5 6 7 8 9 10

- In your perception, how much of a foreign accent do you have in the language? (0=no; 5=moderate; 10=pervasive): 0 1 2 3 4 5 6 7 8 9 10
- How frequently do others identify you as a non-native speaker of the language, based on your accent? (0=never; 5=half the time; 10=always): 0 1 2 3 4 5 6 7 8 9 10
- To what extent do you identify yourself with the culture of the people who speak the language? (0=no identification; 10=complete identification): 0 1 2 3 4 5 6 7 8 9 10

Debriefing Questions

1. Was the font used either too big, or too small?
 - a. What about the style of the letters?
2. Was the self-paced reading task too long overall?
 - a. Would an extra break have been helpful?
3. On a scale of 1-7 (1=very easy, 7=very difficult), how hard was the self-paced reading task? (the one on the computer)
4. Were you able to keep focus throughout the entire experiment?
5. Did you have any problems with the vocabulary or the wording in either the context sentence or the sentence you clicked through word by word?
6. Did the Spanish used in the self-paced reading task seem to favor a specific dialect of Spanish, or did it feel fairly standard to you?
7. Were you able to figure out what the self-paced reading task was testing? If so, please explain:
8. Did you use any strategies to help you through the self-paced reading task? (such as clicking through the words rapidly to answer the question after?)
9. Have you participated in any other linguistic experiments? Or any other experiments?
10. Was there anything else about the experiment thus far that you noticed or would like to comment on?

Vocabulary

Please provide the English translation of the following words

aburrido		autor	
apasionado		bébe	
aventurero		bombero	
barato		cerdo	
bonito		coche	
cariñoso		criminal	
caro		decisión	
débil		diamante	
delgado		estudiante	
deshonesto		equipo	
difícil		gato	
divertido		insecto	
elegante		investigación	
enojado		juez	
estudioso		ladrón	
estúpido		madre	
feo		modelo	
fuerte		monja	
gordo		niño	
honesto		orangutanes	
importante		padres	
influyente		pared	
inteligente		patito	
ocupado		película	
orgullosa		problema	
patético		profesor	
pesado		reina	
perezoso		secretaria	
simpático		videojuego	
talentoso			
tímido			
valiente			

Semantic Interpretation Task: Meaning Changers

For the following sentences, please indicate the meaning of the underlined portion of the sentence by circling the corresponding box.

1. Mi tío es un pobre hombre.

My uncle is
unfortunate.

The man is
not wealthy.

2. La leche pura sabe rico.

Pure milk
tastes good.

Just/mere
milk tastes

3. Tomas es mi viejo amigo.

Thomas is my
long-time
friend.

Thomas is my
friend who is
elderly.

4. El examen preguntó los problemas simples.

The exam
asked simple
questions.

The exam
asked
common

5. El solo abogado trabaja por la noche.

The only
lawyer works
at night.

The single
lawyer works
at night.

6. Maria es una única niña.

Maria is an
only child.

Maria is a
unique child.

7. El hombre es un alto funcionario en la empresa.

The man is a
high-ranking
official in the
business.

The man is a
tall official in
the business.

8. La princesa vive en un real castillo.

The princess
lives in a real
castle.

The princess
lives in a
royal castle.

9. Mi amiga seria no le gusta salir.

My
true/serious
friend.

My friend who
is a serious
person.

10. Vi el mismo actor en la película.

I saw the
actor himself
in the movie.

I saw the
same actor in
the movie.

11. Las sillas raras estan en la sala.

The rare
chairs are in
the living
room.

The strange
chairs are in
the living
room.

12. La tienda vende las gafas varias.

The store
sells different
types of
glasses.

The store
sells several
glasses.

13. Ciertas respuestas son misteriosas.

Certain
answers are
mysterious.

True/Correct
answers are
mysterious.

Semantic Interpretation Task: Experimentals

For the following sentences, please indicate the meaning of the underlined portion of the sentence by circling the corresponding box.

1. Los doctores ocupados hacen mas errores.

Doctors, who are busy, make errors.

The busy doctors, not the ones with free time, make errors.

2. El vino barato tiene un mal sabor.

Wine, which is cheap, tastes bad.

Cheap wine tastes bad, not expensive wine.

3. Las elegantes joyas son reservado para la reina.

The jewelry, which is elegant, is reserved for

The elegant jewelry is reserved for the queen, not the

4. Los incas valientes resistieron a los conquistadores.

Incas, who are known to be brave, resisted the conquerors.

Only valiant Incas resisted the conquerors, cowardly Incas did not.

5. Los libros aburridos me dan sueño.

Books, which are boring, make me sleepy.

Boring books, not the exciting books, make me sleepy.

6. Las personas simpáticas les gusta sonreír.

People, who are friendly in general, like to smile.

Friendly people, not angry people, like to smile.

7. **Las bonitas chicas son arrogantes.**

Girls, who are pretty, are arrogant.

The pretty girls, not the unattractive ones, are

8. **Los contratos importantes necesitan ser firmados.**

Contracts, which are important, need to be signed.

Important contracts need to be signed, not the insignificant ones.

9. **Los orgullosos padres hablan de sus hijos.**

Parents, naturally proud, talk about their children.

Proud parents, as opposed to embarrassed parents, talk about their kids.

10. **Los gatos enojados no dudan en pelear.**

Cats, who are angry, don't hesitate to fight

Angry cats, not happy cats, don't hesitate to fight.

11. **Los niños timidos no dejan el lado de sus madres.**

Children, who are timid, don't leave their mother's side.

Timid children, not brave, don't leave their mother's side.

12. **Los modelos delgados no comen mucho.**

Models, who are thin, don't eat much.

Thin models don't eat much, compared to plus-size

13. **Los pesados camiones manejan muy despacio.**

Semi-trucks,
which are
heavy, drive
very slowly.

Heavy semi-
trucks drive very
slowly,
compared to the
light trucks

14. **Los ladrones deshonestos le mienten a la policia.**

Thieves, who
are dishonest,
lie to the police.

The dishonest
thieves, not the
honest ones, lie
to the police.

15. **Los inteligentes profesores leen mucho.**

Professors, that
are intelligent,
read a lot.

Intelligent
professors, as
opposed to slow
professors, read
a lot.

16. **Los musicos apasionados escriben sus propias canciones.**

Musicians, who
are passionate,
write their own
songs.

Passionate
musicians, not
indifferent
musicians, write
their own songs.

17. **Los perros perezosos duermen en el sol.**

Dogs, which are
lazy, sleep in the
sun.

Lazy dogs, not
active dogs,
sleep in the sun.

18. **Las mujeres debiles no levantan pesas.**

Women, who are
physically weak,
don't lift weights.

Weak women,
not strong
women, don't lift
weights.

19. **Las gimnastas talentosas practican mucho.**

Gymnasts, who are talented, practice a lot.

Talented gymnasts practice a lot, not poor gymnasts.

20. **Unos estudiosos estudiantes vinieron al congreso.**

Some students, who are studious, came to the conference.

Some studious students came to the conference, not the lazy ones.

21. **Los montañeros aventureros viajan por el mundo.**

Mountain climbers, who are adventurous, travel the world.

The adventurous mountain climbers, not the timid one, travel the world.

22. **Los gordos cerdos comen todo el dia.**

Pigs, which are fat, eat all day.

Fat pigs, not skinny pigs, eat all day.

23. **Los tigres fuertes dominan los ciervos.**

Tigers, who are strong animals, overpower deer.

The strong tigers overpower deer, not the weak tigers.

24. **Las dificiles matemáticas confunden todo el mundo.**

Math, which is difficult, confuses everyone.

Difficult mathematics, not the easy kind, confuses everyone.

25. **Los feos patitos se convierten en cisnes.**

Ducklings, which are ugly, become swans.

Ugly ducklings become swans, not cute

26. **Los honestos ciudadanos pagan los impuestos.**

Citizens, who are honest, pay their taxes.

The citizens who are honest, not the dishonest ones, pay their taxes.

27. **Los caros diamantes brillan en la luz.**

Diamonds, which are expensive, sparkle in light.

The expensive diamonds sparkle in the light, not the

28. **Las excusas patéticas no resuelven los problemas.**

Excuses, which are pathetic, don't fix the problem.

Pathetic excuses don't fix the problem, unlike good excuses.

29. **Los políticos influyentes se hacen conocidos.**

Politicians, who are influential, become well known.

Influential politicians become well known, not the unimportant

30. **Para los adultos divertidos, la vida es una fiesta.**

For adults, who are fun, life is a party.

For those adults, who are also fun not boring, life is a party.

31. Los estúpidos criminales fueron detenidos.

The criminals,
who are stupid,
were arrested.

The criminals,
who are stupid,
not smart, were
arrested.

32. Las novias cariñosas cuidan a sus novios.

Girlfriends, who
are caring, take
care of their
boyfriends.

The girlfriends
who are caring,
but not the mean
ones, take care
of their
boyfriends.

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BIOGRAPHICAL SKETCH

Carlie Anne Overfelt was born November 30th, 1985 in Radford, Virginia. The younger of two children, she grew up in Galax, Virginia, graduating with honors from Carroll County High School and the Southwest Virginia Governor's School for Math, Science and Technology in 2004. She earned her B.A. in Linguistics, with a minor in Spanish from the University of Virginia in 2008, and an M.A. in Linguistics from the University of Florida in 2012.

A summer abroad during 2007 in Valencia, Spain spurred Carlie to seek work outside the US. Upon graduating from U.Va. in 2008, she moved to Madrid, Spain to pursue a job in teaching English as a foreign language. There, she completed a TEFL class in order to earn certification to teach. She spent the following year teaching various levels and age groups of learners in Madrid, and traveled throughout the country. In her free time, she also worked with a local international student housing company to translate texts from Spanish to English, and continues to work for them sporadically.

After returning to the United States in the Fall of 2009, Carlie applied and was accepted to the University of Florida, and spent the next year working in Galax, Virginia to prepare for graduate school. In Gainesville, she received the tremendous opportunity to manage the Brain and Language Lab at UF, under the direction of Dr. Edith Kaan. The current paper is the product of work completed in that lab.

Following her time in Florida, Carlie plans to look for work in the Northern Virginia/Washington DC area, to be close to family and friends. Her parents, Lloyd and Debbie, have retired from work in the field of Special Education in Galax, Virginia, and her older brother, Jeremy, is growing in the ranks of college football while currently

working as Special Teams Coordinator and strength and conditioning coach for all teams at Shepherd University outside DC in Shepherdstown, West Virginia.