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COMPREHENSION OF COLLOCATIONS IN ENGLISH AND SPANISH: EXPLORATORY
STUDY WITH SPANISH SPEAKERS.

by

STEPHANIE M. DIAZ

Under the Direction of Julie A. Washington, PhD

A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of

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Georgia State University

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ABSTRACT

From infancy through adulthood, the lexicon continuously grows, reaching an estimated 20,000 lexical units of language for a monolingual English-speaker (Nation & Waring, 1997). In addition to words, speakers must master meaningful phrases and “chunks.” One of the biggest lexical challenges is collocation acquisition, where a speaker must learn meaningful units of language to build grammatical phrases (Goldberg, 1995). Collocations are words that naturally co-occur in a linguistic context, e.g., “strong coffee” (Benson, Benson, & Ilson, 1986; Nation, 2001). Knowledge of collocations is beneficial to second language and dual language learners to gain proficiency in both languages. Research has suggested that bilinguals have lower comprehension, and often misuse collocations when compared to native speakers (Bahns & Eldaw, 1993; Laufer & Waldman, 2011). The purpose of this study is to determine whether Spanish-English bilingual college students comprehend collocational phrases, and whether English language proficiency impacts comprehension and utilization of translation strategies.

INDEX WORDS: Bilingual, Collocation, Comprehension

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August 2021

DEDICATION

I would like to thank my abuelo, Ricardo Portela, for always picking me up from school and pushing me to pursue my dreams. He did not get to see this part of my journey, but I know he was encouraging me throughout this process.

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TABLE OF CONTENTS

ACKNOWLEDGEMENTS	V
LIST OF TABLES	IX
1 INTRODUCTION	1
1.1 What is a Collocation?	1
1.2 Collocation Production and Comprehension in Native Speakers	1
1.3 Bilingual Speakers and Collocations	3
<i>1.3.1 Research in L1 vs. L2</i>	<i>.....</i>	<i>5</i>
<i>1.3.2 Spanish-English Bilinguals</i>	<i>.....</i>	<i>7</i>
<i>1.3.3 Methods in Collocation Studies with Bilingual Speakers</i>	<i>.....</i>	<i>9</i>
1.4 Current Study	12
2 METHOD	14
2.1 Participants	14
2.2 Procedures	15
2.3 Measures	16
2.4 Coding Scheme	17
3 RESULTS	19
3.1 English Language Proficiency	19
<i>3.1.1 English Language Proficiency and Collocation Comprehension</i>	<i>.....</i>	<i>19</i>
<i>3.1.2 English Language Proficiency and Collocation Categories</i>	<i>.....</i>	<i>20</i>

3.2	Translation Strategies on Collocations.....	21
3.2.1	<i>Translation Strategies across Collocation Categories</i>	<i>22</i>
3.3	Speaker Characteristics.....	22
3.3.1	<i>Contributing Factors</i>	<i>23</i>
3.3.2	<i>Current Exposure</i>	<i>23</i>
3.3.3	<i>Speaker Characteristics and Collocation Comprehension</i>	<i>24</i>
3.3.4	<i>L1 vs. L2 Learning Contributors and Collocation Comprehension.....</i>	<i>24</i>
3.3.5	<i>Speaker Characteristics and Collocation Comprehension across Categories</i>	<i>25</i>
3.3.6	<i>L1 vs. L2 Learning Contributors and Collocation Categories</i>	<i>25</i>
3.3.7	<i>L1 vs. L2 Current Exposure and Collocation Categories</i>	<i>26</i>
4	CONCLUSION	28
4.1	Limitations.....	32
4.2	Future Research	33
	REFERENCES.....	34
	APPENDICES.....	41
	Appendix A: List of Activities and Language Used	41
	Appendix B: LEAP-Q Questionnaire.....	42
	Appendix C: Collocations and Experimental Tasks.....	46
	Appendix D: Proficiency in English between L1 in Spanish vs. English	48

Appendix E: Correlations between Collocation Tasks and English Proficiency Domains	
.....	49
Appendix F: Frequency and Utilization of Translation Strategies	50
Appendix G: Paired-Samples t tests for L1 and L2 Speaker Characteristics	52
Appendix H: Correlations of Speaker Characteristics	53

LIST OF TABLES

Table 1. Participant Description	15
Table 2. Proficiency in English between L1 in Spanish vs. English	48
Table 3. Pearson Correlations between Collocation Tasks and English Proficiency Domains....	49
Table 4. Pearson Correlations between Collocation Categories and English Proficiency Domains.	49
Table 5. Total Frequency and Percentage of Utilization of Translation Strategies	50
Table 6. Frequency and Percentage of Utilization of Translation Strategies across categories ...	51
Table 7. Paired-Samples t Test for L1 and L2 learning contributors.....	52
Table 8. Paired-Samples t Test for L1 and L2 current exposure.	52
Table 9. Pearson Correlations of L1 and L2 learning contributors across both tasks.	53
Table 10. Pearson Correlations of L1 and L2 learning contributors across collocation categories.	53
Table 11. Pearson Correlations of L1 and L2 current exposure across collocation categories. ...	54
Table 12. Significant Pearson Correlations on learning contributors in all conditions	54

1 INTRODUCTION

Collocations are words that naturally co-occur in a linguistic context, e.g., “strong coffee” or “fast food” (Benson, Benson, & Ilson, 1986; Nation, 2001). Knowledge of collocations assists learners of a language with production of natural-sounding speech (Crowther, Dignen & Lea, 2002). To have language fluency it has been argued that collocational knowledge is essential (Hill, 2000; Laufer & Waldman, 2011, Nesselhauf, 2003). Despite the arguments of the importance for collocational knowledge, many students use them improperly well into adulthood (Nesselhauf, 2003).

1.1 What is a Collocation?

Collocations were initially defined as “actual words in habitual company” (Firth, 1957, pg. 182). Hill and Lewis (1997) stated that collocations are one of the most important features of a “coherent, fluent, comprehensible, and predictable” speaker of a language (p.1). Bley-Vroman (2002) argued that collocations are a by-product of their real-world referents. For example, *bright light* is a collocation because the words bright and light co-occur as descriptors of each other. Sinclair (1991) discussed that collocations are semi-idiomatic and not entirely predictable, and native speakers appear to store them as word units.

1.2 Collocation Production and Comprehension in Native Speakers

To understand how second language learners acquire collocations it is useful to understand how native speakers acquire them. McCarthy (1984) argued that collocation knowledge is strongly related to someone’s own culture. He discusses how collocations are deemed “right” or “wrong” from native speakers of a language. Ellis (2001) theorized that for native speakers, collocations are implicitly learned by breaking them down into units, or ‘chunks’ of information (Section 3.2). He discusses the ‘Law of Contiguity’ which is a rule

stating that, “objects once experienced together tend to become associated in the imagination” (James, 1890, quoted in Ellis, 2001). Therefore, the frequent co-occurrence of language units often will lead them to become associated in long term memory. Ellis also emphasized implicit learning but points out meaning is essential to collocation acquisition. Therefore, we can assume that the co-occurrence of commonly used language units, such as collocations, may be more salient to second language learners if they implicitly learn them.

In a sample of native English speakers, Ellis, Frey, and Jalkanen (2006) instructed participants to work on a lexical decision task that used collocations. Their experiment focused on whether native English speakers were sensitive to collocation frequency on a lexical access task (i.e., word recognition task). Participants were asked to look at a computer and decide between two-word pairings. One pair would consist of a collocation, while the other pair consisted of two words that were unrelated (e.g., cause problems vs. phrup problems). Participants were instructed to respond ‘yes’ or ‘no’ to whichever collocation was more appropriate as fast as they could. The authors wanted to determine whether language processing was more sensitive to formulaic language, such as collocations. Their results indicated that native speakers recognized frequent verb-argument and booster-adjective pairs, preferring them over pairs that were less frequent. The authors used the Kennedy (2003) definition for booster and maximizer collocations as those which use high frequency objects to modify adjectives, verbs, and adverbs (e.g., end war vs. finish war/ start afresh vs. begin afresh).

Similarly, in Koya (2006) the author wanted to understand native English speakers’ collocation use through corpus analysis. They analyzed high frequency collocations that were used in the British National Corpus (BNC) and the TIME (Standard North American English) corpus. The goal was to determine which were high frequency collocations for native English

speakers and whether these high frequency collocations were reflective of the standards for speakers learning English in Japan. They determined that the most common collocations used by native English speakers were verb-noun collocations and this was evident in both corpora, BNC and TIME. Further, they concluded that regardless of the topic or domain being discussed, verb-noun collocations were still the most high-frequency collocations being implemented.

1.3 Bilingual Speakers and Collocations

Bilingual speakers have been shown to have less knowledge of collocations in the second language they acquire, and when they are aware of them, often misuse them (Bahns & Eldaw, 1993; Laufer & Waldman, 2011). This poor knowledge of collocations and their meanings has prompted some researchers to try to identify the specific strategies bilingual speakers may employ to overcome or, in some cases, avoid collocations. This research has demonstrated that bilingual speakers, or EFL students, may use many strategies, including avoiding certain phrases, adopting literal translations (e.g., Dastmard, Gowhary & Azizifar, 2016; Dweik & Shakra, 2010), or using synonyms and other “appropriate” alternative vocabulary (e.g., Bahns & Eldaw, 1993; Shraideh & Mahadin, 2015).

In a related study, Dastmard et al. (2016) examined the collocation use of Iranian EFL students who were advanced and intermediate speakers of English and Persian. They found that their participants relied heavily on literal translations to switch between English and Persian. The authors also found that the participants had the greatest difficulty with verb-noun, verb-adjective, and adjective-preposition collocations. The authors also determined that the participants’ “mother tongue,” or L1, was a large contributor of interference, or error, in collocational translations. In a similar study, Shraideh and Mahadin (2015) examined the differences between translation strategies on collocations amongst master’s level and bachelor’s level college

students who were studying to be English translators. The participants were asked to translate English political texts into Arabic. The participants preferentially used synonymous and literal translation strategies when they came across collocational phrases.

Emphasis on understanding the impact of collocate-node and congruency has also highlighted discrepancies in bilingual collocation understanding. Collocate-node relationships are defined as collocations with adjective-noun, verb-noun, phrasal-verb-noun word pairings. Congruency is defined as the presence or absence of a literal L1 translation equivalent (Nesselhauf, 2003; Peters, 2016). For simplicity, in this paper we will refer to congruent collocations as those with literal L1 translations, and incongruent collocations as those without literal L1 translation equivalents. Peters (2016) examined congruency and collocate-node relationships in Dutch-English foreign language learners. Their results demonstrated that incongruent collocations, those that could not be translated literally, were harder to recall. Also, that their participants were able to recall Adjective-Noun (e.g., perishable goods) collocations with greater accuracy than all other collocate-node relationships. The author mentions that even when taking congruency into account, verb-noun and phrasal verb-noun collocations (e.g., run up a deficit, tie up capital) were the most difficult collocations for EFL learners to acquire. In their study they indicated that this might be due to the morphological variations of verb-noun collocations (e.g., dance/ dancing) and how these impacted meaning. The current study will examine verb-noun pairings in both congruent and incongruent collocation contexts, as verb-noun collocations are the most highly used collocations in the English language (Benson et al., 1986).

1.3.1 Research in L1 vs. L2

It has been argued that the real difficulty L2 learners have with collocations is with accurate production of variable collocations. Variable collocations are often defined as a variety of collocations with various collocate-node combinations (e.g., sour milk/curdled milk), including verb-noun combinations. Bahns and Eldaw (1993) conducted an empirical study in which they administered a verb-noun collocation translation task to German-English foreign language students. They concluded that many of the incorrect lexical productions observed for these students could be attributed to inappropriate collocation usage. Specifically, they argued that for their participants collocations were not easily paraphrased and therefore made it difficult to translate or to use them appropriately in a cloze task. The authors compared general lexical word knowledge and collocation knowledge and found that learners are twice as likely to select unacceptable collocations than unacceptable lexical words, suggesting that it is not just knowledge of the individual word meanings that was problematic, but the change in meaning intended when combinations of these words were used. They concluded, therefore, that explicit instruction of collocations is essential for English language learners because of the difficulty in paraphrasing collocations and how literal translations of these word pairings can lose their intended meaning.

Ding and Reynolds (2019) were focused on understanding the relationship between L1 congruency and L2 proficiency on English collocation processing. The participants in their study were Chinese EFL learners and a comparison group of L1 English native speakers. After an analysis of their data, they concluded that congruent collocations, which had literal meanings, were processed more accurately and faster than incongruent collocations across both groups. For example, collocates with high congruency in English and Chinese like ‘do research’ had higher

processing speeds than incongruent collocates like 'keep an eye.' They also found that noun-noun collocations had a greater processing advantage than verb-noun collocations. They concluded that this advantage was because noun-noun collocations might be more experience-driven whereas verb-noun collocations are semantically based and require semantic links to process them, increasing their difficulty.

This finding of more difficulty with verb-noun collocations has been reported by others for other languages as well. Nesselhauf (2003) found that verb-noun errors accounted for a third of all errors in collocational tasks in their German-English foreign language learners. Also, that incongruent collocations had a greater rate of error when presented. They concluded that their participants misused most collocations, and overused ones with which they were confident regardless of accuracy.

Overall, the data from these studies suggest that some collocations are harder to comprehend than others. Specifically, collocations that do not have a literal translation from L1 to L2, and those that include verbs appear to be hardest to manage. Interestingly, Hasselgreen (1994) found that English language learners were often aware of collocations but did not know how to use them in everyday speech. This raised issues concerning whether those learning English, or two languages, were comprehending what the collocations meant and whether poor knowledge of collocations or misunderstanding and misusing them effect the strategies employed in translations.

Importantly, not all collocation studies find that bilingual participants are disadvantaged when it comes to collocations. A study by Siyanova and Schmitt (2008) using English-Russian bilinguals concluded that more than half of their participants produced appropriate Verb-Noun collocation combinations on a cloze task. In the same study, English-Russian bilinguals and

monolingual peers did not differ in the appropriate use of collocations. In a similar study, Durrant and Schmitt (2009) were interested in native and non-native Turkish-English and Bulgarian-English language learners and how they used collocations in their writing. They discuss idiomatic formulas as forms of collocations. Idiomatic formulas are a form of formulaic language that consists of phrases or words commonly associated with one another to enhance speech or communication (Geeraerts et al., 2010). They concluded that high frequency collocations were being employed by non-native speakers, especially if the collocates had a noun. These findings are similar to other studies of oral collocation use. The conclusions from these studies indicate that collocation knowledge in bilinguals and EFL students may not be completely disadvantaged. However, the definition of collocation is variable amongst the studies, making it difficult to compare them. The authors also employed populations with dissimilar language and cultural backgrounds; ease of collocation use may differ from one language to another. To determine whether collocation knowledge is specific to certain language backgrounds there needs to be further investigation.

1.3.2 Spanish-English Bilinguals

Collocations have been studied in various languages, across many language families. Studies of Turkish (Mutlu & Kaslioglu, 2016; Mutlu & Kaslioglu, 2016) Arabic (Habtoor & Al-Swaidan, 2019; Tabatabaei & Hoseini, 2014), German (Bahs & Eldaw, 1993; Nesselhauf, 2003), and Dutch (Peters, 2016) are common. What is less common are studies of collocational use in Spanish-English bilinguals. Spanish is the second most spoken language in the United States (Burton, 2018), making it an important language to understand. The Pew Research Center in 2014 estimated that there will be 138 million Spanish speakers by the year 2050. By way of

comparison, the third most spoken language in the US is Mandarin and Cantonese Chinese, which is spoken by approximately 3 million people (Gonzalez & Lopez, 2013).

A study by Lopez, Vaid, Tosun, and Rao (2017) was focused on understanding language brokering experience and adjective-noun phrases with literal and non-literal translations.

Language brokering is often described as a phenomenon in which children or adolescents are informal translators for their family or community (Shannon, 1990). Participants were Spanish-English bilingual adults who were described as highly proficient in both languages. The results indicated that language brokering experience facilitated judgements of literal and figurative meaning. For example, adults who were classified as 'brokers' were better able to distinguish between literal (e.g., stinging insect) and figurative (e.g., stinging insult) meanings compared to those who were non-brokers.

Similarly, Lopez and Vaid (2018) were interested in idiom comprehension during language brokering experiences. In this study they described idioms as figurative language which often does not have a literal meaning and can be composed of collocational phrases. The Spanish-English bilingual participants were presented with an idiomatic phrase such as 'a piece of cake' that was followed by a target word in English or Spanish that was related to its figurative meaning. They were also presented with target words that were not related to the figurative meaning. For example, a piece of cake is an idiomatic phrase that represents the word 'easy' in English and 'facil' in Spanish. They had the option to choose 'yes' or 'no' when the word meaning matched the intended meaning of the targeted phrase. They found that language brokering experience facilitated idiom meaning comprehension across language boundaries, and that variability in language practices can be related to bilingual proficiency. These outcomes

suggest that understanding someone's language experiences, in this case informal translation practices, may provide insight into their proficiency in both languages.

Fernandez and Schmitt (2015) were interested in whether exposure and frequency of collocations were related to amount of production in Spanish-English foreign language learners. Specifically, they examined the productive knowledge of 50 collocations. Their results indicated that the participants knew an average of 56% of collocations with which they were presented. Interestingly, engagement with English outside of explicit instruction had a moderately positive correlation to knowledge of collocations. This study introduced the possibility that non-instructional activities such as reading, watching TV and overall English exposure can enhance collocational knowledge and production.

Overall, empirical findings using Spanish-English participants show that collocational knowledge can be facilitated through language experience that is not explicitly taught in the classroom. Language brokering and media exposure in both English and Spanish have been found to be facilitative of collocational knowledge and production. However, the language experience of participants across studies is not similar. Some participants learned both languages during childhood, while others are currently learning English while in adulthood. Further, unlike other languages, methods in Spanish-English studies focus globally on comprehension of collocations related to language experience. They provide no insight into the impact of the type of collocation (i.e., congruent vs. incongruent) on collocation comprehension choice.

1.3.3 Methods in Collocation Studies with Bilingual Speakers

Methods used to examine collocations vary widely across studies. Bahns and Eldaw (1993) used a cloze task (e.g., 1. When she was a teenager, she used to _____ a diary) and a translation task (e.g., 1. Als Teenager hatte sie damit begonnen, regelmig Tagebuch zu fiihren)

to determine German EFL student's knowledge of collocations across English and German. These tasks are commonly used in studies of collocations. In both the cloze and translation task the authors used 15 English verb-noun collocations. The authors told participants to translate German sentences into English, and to fill in the target word that was missing in the cloze task. Similarly, Fernandez and Schmitt (2015) used a productive collocation test that had 96 collocations. Participants were 108 Spanish speakers living in Spain, with varied proficiency in English. The participant was instructed to read a sentence in Spanish and then presented with a "fill-in-the-gap" sentence with the target collocation in English. The first letter of the target collocation was left in the English sentence.

28. Mi tía está siguiendo una dieta muy estricta porque el vestido que se compró para la boda de mi hermana le queda pequeño, y quiere entrar en él.

She wants to l_____ some w_____ by next month.

Finding lexical equivalents to collocations has been difficult for translators (Iranmanesh & Azadmanesh, 2015), regardless of the type of task selected. Without proper translation and connection between languages it can be difficult for English language learners to develop fluency or comprehension standards for collocations.

Habtoor and Al-Sawidan (2019) were interested in whether their English foreign language learners had familiarity with collocations and what strategies they used in translating them into Arabic. The participants were English foreign language majors in a University so they hypothesized that they would know many more collocations than the average student who was not studying English. However, this was not the case. After administration of the collocation translation task the authors deemed the participants knowledge as unsatisfactory according to the benchmark standards set by the school for competent English speakers. However, those with

higher English proficiency were able to use more translation strategies to transform the collocations into Arabic compared to those with lower English proficiency. This is similar to the findings in language brokering studies (Lopez, Vaid, Tosun & Rao, 2017; Lopez & Vaid, 2018) which suggest that proficiency with both languages supports comprehension of collocations.

In an interesting corpus analysis by Iranmanesh and Azadmanesh (2015) the researchers examined translations used of the book *The Great Gatsby*. They wanted to see what collocation translation strategies were used by professional translators to adapt the book over time from English to Persian. This study was interesting because it was using a very widely available book and what the authors assumed were professional translators. However, they concluded that the most common collocation translation strategy even for these professionals was literal translation. In another study by Gallego Hernandez (2012), the author examined translation strategies used in news stories discussing crisis events. Similarly, they found that trends pointed toward literal translation when using collocations in French to Spanish translations. Also, when literal translation was too vague, they employed metaphorical language. The author concluded this might indicate that some collocations may be language specific and not cross-linguistic.

In addition to the structural characteristics of collocations themselves, characteristics of the speaker which have been found to be important in bilingual Spanish-English language learners, may influence collocation use and comprehension. For example, Bowers and Kennison (2011) examined whether age of acquisition might play a role in bilingual word translation in a sample of Spanish speaking adults learning English. They measured age of acquisition indirectly by dividing word groups into those that are ‘acquired early’ in development (e.g., squirrel/ardilla) and those that are ‘acquired later’ (e.g., ankle/tobillo). They asked their Spanish-English bilingual adult participants to translate Spanish words into English and English words

into Spanish. They concluded that L1 words that were typically acquired at early ages had longer translation times among their adult participants and interpreted this as an age of acquisition issue. Age of acquisition is typically defined as the age at which an individual acquires a second language. Many speakers learn English collocations as adults, even when they learn to speak English as children. It seems important to understand the relationship between age of acquisition of L2 and comprehension of collocations in both languages.

1.4 Current Study

The conflicting results using collocation tasks, collocate nodes (e.g., noun-noun, verb-noun), and language backgrounds of participants raises questions about whether English bilinguals are using collocations appropriately and what strategies they employ to translate collocations between languages. Most of the empirical findings on collocation knowledge employed samples that were actively learning a second language or who had acquired English as adults. In this study the sample will be Spanish-English bilingual college students who learned English before the age of 6 and are therefore presumably English proficient. Comprehension of collocational phrases and the translation strategies used to comprehend congruent vs. incongruent verb-noun collocations will be examined for this sample of speakers.

Further this investigation will introduce a third category of collocations that have not been addressed in the extant literature. That is collocations where the Spanish translation may be more ambiguous and unclear for native Spanish speakers. For example, in English there is a collocation “do the dishes,” however, in Spanish native speakers would use “lavando los platos” If we directly translate “lavando los platos” into English, it would be “washing the dishes.” The collocation “do the dishes” is only present in English, and not something commonly used by native Spanish speakers. The hypothesis is that participants who report a higher proficiency level

in English will provide appropriate translations for these sentences by calling upon their knowledge of English for translation of these ambiguous sentences. Accordingly, the following questions are posed:

What factors influence the comprehension of English collocations in bilingual Spanish-English college students? More specifically,

1. What is the impact of proficiency (or reported experience) in English on the ability to interpret collocations presented in English and in Spanish?
2. What strategies do English-Spanish bilingual college students use to translate collocation tasks presented in Spanish?
 - a. What impact does collocation congruency have on translation strategies selected?
 - b. What differential influence do ambiguous collocations present for translation?
3. How do speaker characteristics (e.g., current exposure, language learning influence) impact comprehension of English collocations?

2 METHOD

2.1 Participants

A total of 212 people responded to the Qualtrics survey developed for this study. Of these respondents 70 were excluded, leaving 142 total participants. Respondents were excluded for the following reasons: 13 did not meet the age requirements. 26 did not complete the translation or cloze task portion of the survey. 31 respondents did not achieve the basal score on the Woodcock-Muñoz Passage Comprehension subtest; a minimum of grade 3 reading level in Spanish was necessary on this subtest to be included in this study.

The participants included in the analyses in this study were 142 Spanish-English bilinguals (38 males and 104 females) who were currently enrolled in a U.S. college or university. The age range was 18-30 years (average 21.5 years). The age range for participation was selected to encompass the average age range of higher education students in the United States (NCES 2016). All participants were second generation bilinguals based on self-report. Second generation bilinguals are adults who were either born and raised in the United States, or arrived during childhood (Heidrick, 2017). Typically, their native language is maintained and learned in the household, and their secondary language may have been acquired while at school (Ardilla et al., 2016), or they may have learned English prior to entering school. Nationality of speakers was allowed to vary, placing no restrictions on the dialect of Spanish used by participants. The majority of the sample, 84%, had at least some college experience and 53% had college degrees. Table 1 provides a description of participants by age, gender, highest level of education and nationality.

Table 1. Participant Description

Baseline Characteristics	Full Sample		
	n	(mean age/SD)	%
Gender			
Female	104	(22.38/3.144)	73.2
Male	38	(22.79/3.144)	26.8
Highest Level of Education			
High School graduate	23		16.2
Some College	44		31
College graduate	44		31
Some Graduate School	17		12
Master's degree	12		8.4
Ph.D./M.D./J.D.	2		1.4
Nationality			
US-American	19		13.7
Mexican American	41		29.5
South American	36		25.9
Central American	13		9.4
Caribbean	33		21.5

Note. N=142. Participants were on average 22.49 years old (SD=3.23).

2.2 Procedures

The procedures involved administration of a translation and collocation cloze task, both adapted from Bahns and Eldaw (1993). Each task is presented in more detail below. The translation task was presented in Spanish and the cloze task was presented in English. These tasks were chosen for their potential to provide insight into the strategies used by Spanish-English bilinguals to comprehend collocations presented in both languages. The Flesch-Kincaid Grade Level tool was applied to the experimental sentences to determine at what grade level sentences were written (Kincaid et al., 1975). The results suggested that the maximum grade level represented was third grade across the cloze and translation tasks. Accordingly, before administration of the translation and cloze tasks, participants were asked to read text from the Woodcock-Muñoz Language Survey Passage Comprehension subtest to establish Spanish reading proficiency of at least third grade which corresponded to a basal score of 6 or above.

A Qualtrics survey was created for data collection purposes. There were two forms of the survey that displayed the cloze task and translation tasks in different orders to establish a

counterbalanced grouping of the participants. This means that the cloze task and translation task were randomly given to each participant in different orders, so that each participant would either get one or the other first. The instructions for the tasks were written in English. For the translation task, participants were prompted with “the following section of the survey will provide you with a sentence written in Spanish. To the best of your ability translate that sentence into English so that both the Spanish sentence and the English sentence mean the same thing.” For the cloze task, participants were told “the following section of the survey will provide you with a sentence in English. The sentence has a missing target word. To the best of your ability provide one word that best completes the sentence.” Once the tasks were completed, participants were prompted to complete a background questionnaire. Appendix A provides the instructions and language used for each activity in this project.

2.3 Measures

1. The **translation task** consisted of 30 collocation sentences presented in Spanish that required translation into English. The sentences fell into three categories: **congruent** (e.g., “matar el tiempo”/ “kill time”), providing literal translations between Spanish and English, **incongruent** (e.g., “guardar un asiento”/ “save a seat”), where no literal translation is appropriate, and **ambiguous** (e.g., “hacienda los platos”/” doing dishes”), where English collocations were translated into Spanish and are not appropriate translations for Spanish native speakers. Each sentence consisted of one Verb-Noun collocation.
1. The **cloze task** consisted of 30 sentences in English that had the same collocation targets as the translation task, but the context in the sentences are different than those presented in the translation task. The sentences were different in order to avoid memorization, or

overlap, between the cloze task and the translation tasks since they were presented one after the other. In these sentences the target collocation was missing (e.g., “pay attention”). Participants were instructed to fill in the blank space with the appropriate English word to complete the sentence.

2. Questionnaire for Spanish-English bilinguals: **The Language Experience and Proficiency Questionnaire (LEAP-Q) (Marian, Blumenfeld & Kaushanskaya, 2007)** was utilized to measure the language proficiency and background of participants. This is a 30-item questionnaire which required participants to discuss language experiences, including age of acquisition, in what contexts English or Spanish is spoken, and what media is consumed in each language. The questionnaire was presented in English.
3. Spanish Reading Measure: The reading measure was from the **Passage Comprehension subtest of the Woodcock-Muñoz Language Survey (2005)**. Participants were asked to read a sentence in Spanish and respond with the best word to fill in the blank to complete the sentence. This measure was given prior to the translation and collocation task and was used to establish Spanish language reading proficiency at the 3rd grade reading level. Participants had to reach a basal score of 6 to be included in the analysis. See Appendix C for a sample of the subtest.

2.4 Coding Scheme

The cloze task and translation tasks were scored using a coding scheme developed by Vinay and Darbelnet (1995). The coding scheme was used to determine whether target words, or appropriate words, were placed inside the blanks for the cloze task. In addition, it was used to determine the translation strategies used by participants while completing the translation task. This scheme was chosen because it has been established in the literature as one of the most

comprehensive models available for use with translation tasks (Dastmard, Goshary, Azizifar, 2016; Iranmanesh & Azadmanesh, 2015). The following elements were coded for congruent, incongruent, and ambiguous collocations and counted:

1. Direct or Literal

- a. Borrowing: Borrowing words that are originally from another language (e.g., kindergarten, croissant).
- b. Calque: Literal translation at phrase level (e.g., English: To have a good time, Spanish: Pasarla bien, Spanglish (Calque): Tener un buen tiempo).
- c. Literal Translation: Word for word translation (e.g., New York to Nueva York).

2. Indirect or Oblique

- a. Transposition: grammatical shift in word class (e.g., “she likes swimming” into “le gusta nadar” not “le gusta nadando”; you change the grammar to make it sound correct).
- b. Modulation: Changing the message by changing point of view (e.g., “you can have it” to ‘te lo dejo’ which literally means “I will leave it with you”).
- c. Equivalence: Explain the same message through different structure and means (e.g., ‘that rings a bell’ translated to ‘I remember that’).
- d. Adaptation: changing of cultural reference when there is a situation in source culture that does not have an equivalent (e.g., Spanish restaurant using ‘pincho’ to describe ‘kebab’ on the menu; pincho and kebab means the same thing but from different cultures).

3 RESULTS

3.1 English Language Proficiency

The Language Experience and Proficiency Questionnaire (LEAP-Q) (Marian, Blumenfeld & Kaushanskaya, 2007) was utilized to establish the language proficiency and background of participants. Question 3, required participants to rate the level of proficiency in domains of speaking, understanding, and reading across English and Spanish on a likert scale from 0 to 10, with 0 being none to 10 being perfect. 114 participants (80.7%) reported Spanish as a first language (L1), and English as a second language (L2). The remaining 28 participants reported English as L1 and Spanish as L2.

Paired-samples t-tests were conducted to determine if there were significant mean differences between participants whose L1 was Spanish vs. English and their proficiency in English across certain domains. Three different paired t-tests were respectively performed for speaking, understanding, and reading in English between participants whose L1 was Spanish vs. English. There was no significant difference between participant mean ratings across all three domains on proficiency in English regardless of L1 reported. Table 2 displays the mean ratings of proficiency in English across domains of speaking, understanding, and reading between those who reported L1 of Spanish vs. English. These results confirmed that based on self-reports participants were proficient in all three domains evaluated by the LEAP-Q. Overall, participants rated English proficiency between the ranges of very good to excellent regardless of their L1.

3.1.1 English Language Proficiency and Collocation Comprehension

Pearson correlation coefficients were calculated to examine the relationship between comprehension of English collocations and self-reported proficiency across speaking, understanding, and reading domains in English only. Cumulative scores were calculated for both

Cloze and Translation tasks to measure comprehension of English collocations. If participants produced the correct target collocation, a score of one was given, if the target was not produced, a score of zero was given. The total score possible on the Cloze task was a score of 30 and on the translation task it was also 30. The LEAP-Q questionnaire was used to determine English proficiency in speaking, understanding, and reading domains across all participants.

Table 3 displays the correlation coefficients between proficiency domains in English only and cumulative scores on both experimental tasks. These results indicate that there were moderate positive correlations between English domains of speaking, understanding, and reading on the cumulative cloze task scores across all participants. As participants ratings on English speaking proficiency ($R=.257$, $p<.001$), English understanding proficiency ($R=.257$, $p<.001$), and English reading proficiency ($R=.269$, $p<.001$) also increased, as did their cumulative cloze task scores. This suggests that for participants whose English proficiency is higher across domains of speaking, understanding, and reading so is comprehension of English collocations.

3.1.2 English Language Proficiency and Collocation Categories

Pearson correlation coefficients were calculated to examine the relationship between comprehension of English collocations across the three categories of collocations (congruent, incongruent, and ambiguous) and self-reported proficiency across speaking, understanding, and reading domains. Cumulative scores were given across the three collocation categories. When the target collocation was produced, a score of one was given, and if the target collocation was not produced it was given a zero. The total score possible in each collocation category was 10.

Table 4 displays the correlation coefficients between proficiency domains in English only and cumulative scores across each collocation category on both experimental tasks. Results indicated that there was a small positive correlation between congruent cloze task scores and

participants English reading proficiency. As participants ratings on English reading proficiency increased ($R=.165$, $p<0.05$), so did scores on the congruent cloze task. There was a small positive correlation between the ambiguous cloze task and participants English speaking proficiency. As participants ratings on English speaking proficiency increased ($R=.169$, $p<0.05$), so did scores on the ambiguous cloze task. There were moderate positive correlations between all English domains and the incongruent cloze task scores. This indicates that as participant ratings increased on English speaking proficiency ($R=.233$, $p<.001$), understanding proficiency (.298, $p<.001$), and reading proficiency ($R=.270$, $p<.001$), so did scores on the incongruent cloze task.

3.2 Translation Strategies on Collocations.

The translation task consisted of sentences in Spanish with 30 target collocations. There were three categories of collocations: congruent, incongruent, and ambiguous. Congruent collocations (e.g., “matar el tiempo”/ “kill time”) have literal translation equivalents between Spanish and English. Incongruent collocations (e.g., “guardar un asiento”/ “save a seat”) have no literal translation equivalents in English and Spanish. Ambiguous collocations (e.g., “hacienda los platos”/ “doing dishes”) are English collocations rendered in Spanish and are not appropriate translations for Spanish native speakers. Each sentence consisted of one Verb-Noun collocation. Participants were instructed to translate the Spanish sentence into English as best they could. To determine frequency of collocation translation strategy we used a coding scheme adapted by Vinay and Darbelnet (1995).

Table 5 displays the percentage use of each translation strategy across all target collocations. Overall, 78.1% of participants provided a correct translation to target collocations across all categories. Equivalence was the leading strategy used by 9.21% of the participants,

followed by literal translations with 7.6%. The least used strategies are transposition, 0.5%, and adaptation, 0.07%.

3.2.1 Translation Strategies across Collocation Categories

Table 6 shows the frequency and percentages of translation strategies across collocation categories. Overall, congruent collocations had the highest percentage of target collocations translated correctly, with 40% correct translations provided. Ambiguous collocations had the highest percentage of incorrect translations, with 57% translated incorrectly. The calque translation strategy, defined as literal translation at the phrase level, was used most often in the ambiguous translation category. Overall, literal translations were used most in both the incongruent and ambiguous translation categories, with 46% and 45% respectively. The transposition translation strategy, defined as grammatical shift in word class, was used most frequently in the congruent collocation category. Finally, equivalence translations were used most frequently in the incongruent and ambiguous translation categories, with 55% and 38% respectively.

3.3 Speaker Characteristics

The Language Experience and Proficiency Questionnaire (LEAP-Q) (Marian, Blumenfeld & Kaushanskaya, 2007) was utilized to measure speaker characteristics in order to understand in what contexts participants typically used their two languages. Question 4, which asked participants to rate the **contributing factors** to learning both L1 and L2, and Question 5 which asked participants to rate **current exposure** to English and Spanish were the focus of the analysis. Both questions were rated on a scale of 0 – 10, with 0 being no contribution and 10 being the most important contributor.

3.3.1 Contributing Factors

The contributing factors for learning both languages probed were interaction with friends, family, watching television, listening to music, and reading. Paired-samples t-tests were conducted to determine if there were significant differences between the different contributors of learning on both L1 and L2 of the participants. There were five different paired t-tests; friends, family, reading, TV, and music across both L1 and L2. Table 7 displays the paired-samples t tests between contributors to learning L1 vs. L2. The results indicate that there was a significant difference in means across all domains between L1 and L2 learning. There was a mean difference of 1.404 for friend's contribution to learning, with friends having a higher contribution to learning L2 than L1. A participant's family contribution to learning had a mean difference of 3.655, with L1 contribution being higher than L2. Participants reading contribution had a mean difference of 0.695, with reading contributing more to learning L2 than to L1. There was a mean difference of 1.213 in television contribution, where television contributed more to L2 learning than L1. Finally, there was a mean difference of .660 between music contribution, with music contributing more to L2 than L1. Overall, family contributed most to L1 learning and factors outside of the home contributed to acquiring L2.

3.3.2 Current Exposure

On the LEAP-Q, Question 5 asks participants to rate current exposure to English and Spanish on a scale from 0-10, where 0 is never exposed and 10 is always exposed. Current exposure to both languages across domains of friends, family, watching television, listening to music, and reading were probed. Paired-samples t-tests were conducted to determine if there were significant differences between participants' current exposure to L1 and L2. There were five paired t-tests focused on friends, family, reading, TV, and music across both L1 and L2. Table 8 displays results across each domain (friends, family, reading, TV, and music). Results

indicated that there was a significant difference in means across all facets of current exposure between L1 and L2 learning. There was a mean difference of 1.645 in current exposure among friends, with participants reporting L2 having a higher exposure in this domain. Participants reported a higher current exposure to L1 among family, with a mean difference of 3.312. Participants reported a higher current exposure to L2 when reading, with a mean difference of 2.852. Similarly, participants reported a higher current exposure to L2 when watching TV, with a mean difference of 2.482. Finally, there was reported higher current exposure to L2 when listening to music, with a mean difference of .824. Again, family provided the most exposure to L1 and factors outside the home provided exposure to L2.

3.3.3 Speaker Characteristics and Collocation Comprehension

Pearson correlation coefficients were calculated to determine the relationship between participants' comprehension of English collocations and speaker characteristics. Cumulative scores on the cloze task and the translation task were compared to the factors contributing to learning and current exposure on L1 vs. L2.

3.3.4 L1 vs. L2 Learning Contributors and Collocation Comprehension

Table 9 displays the correlation coefficients of L1 and L2 learning contributors across both experimental tasks. Results suggested that there is a small negative correlation between the score on the cloze task and music as the contributor for learning L1 ($R = -.268$, $p < .001$). This indicates that as participants ratings of music as a contributor for learning L1 increased, scores on the cloze tasks decreased. Similarly, there was a small positive correlation between cumulative scores on the translation task and family contribution to learning L2 ($R = .175$, $p < 0.05$). So, as participants rating of family's contribution to learning L2 increased, so did the cumulative score on the translation task.

There were no significant correlations between scores on the cumulative cloze or translation tasks and current exposure across domains for L1 and L2.

3.3.5 Speaker Characteristics and Collocation Comprehension across Categories

Pearson correlation coefficients were calculated to determine the relationship between participants' comprehension of English collocations across collocation categories and their speaker characteristics. So, factors influencing the learning of Spanish and English were compared to the score received across collocation categories between both experimental tasks. Similarly, the impact of current exposure to English and Spanish on collocation categories between both experimental tasks were probed.

3.3.6 L1 vs. L2 Learning Contributors and Collocation Categories

Table 10 displays the correlation coefficients of L1 and L2 learning contributors across collocation categories. There were no significant correlations in the congruent category across both the Cloze task and the Translation task. In the ambiguous category of the cloze task, there was small negative correlations on L1 television contribution ($R=-.228$, $p<.001$) and L1 music contribution ($R=-.230$, $p<.001$). This means as participants rating of television and music as contributors for learning L1 increased, scores on the ambiguous category of the cloze task decreased. In the ambiguous category of the translation task, there was a small positive correlation on family's contribution to learning L2 ($R=.199$, $p<0.05$). So, as participants ratings of families as contributors to learning L2 increased, so did scores on the ambiguous category of the translation task. In the incongruent category of the cloze task, there were small negative correlations on L1 reading contribution ($R=-.189$, $p<0.05$) and L1 music contribution ($R=.124$, $p<0.05$). As participant ratings of reading and music as a contributor to learning L1 increased, scores on the incongruent category of the close task decreased. In the incongruent category of the

translation task, there was one small negative correlation on L1 music ($R = -.174$, $p < 0.05$). This means that as participants ratings of music as a contributor to learning L1 increased, scores on the incongruent category of the translation task decreased. Table 12 provides a visual of only significant correlations of learning contributors across all experimental tasks and categories.

3.3.7 L1 vs. L2 Current Exposure and Collocation Categories

Table 11 displays the correlation coefficients of current exposure to L1 vs. L2 across collocation categories in 5 domains: friends, family, reading, TV, and music. These results indicate that there are correlations across all collocations categories among some of the tasks. In the congruent category of the translation task, there is a small positive correlation between current reading exposure in L1 ($R = .167$, $p < 0.05$). This indicates as participants ratings of currently reading in L1 increased, scores on the congruent category of the translation task increased. Similarly, in the congruent category of the translation task, there are small negative correlations between current reading exposure in L2 ($R = -.188$, $p < 0.05$) and current television exposure in L2 ($R = -.185$, $p < 0.05$). This means as participants ratings of currently reading and watching television in L2 increased, scores on the congruent collocation category of the translation task decreased.

There was a small negative correlation between the ambiguous collocation category on the cloze task and your current exposure to L1 among friends ($R = -.166$, $p < 0.05$). This indicates that as participants ratings of current exposure to their L1 among friends increased, scores on the ambiguous category on the cloze task decreased. In the ambiguous category on the translation task, there is a small positive correlation on current exposure to L2 among family ($R = .201$, $p < 0.05$). This exhibits that as participants ratings of current exposure to their L2 among family increased, scores on the ambiguous category on the translation task increased. In the incongruent

category of the cloze task, there was a small negative correlation on current exposure to L1 while listening to music ($R=-.175$, $p<0.05$). This means that as participants ratings of current exposure to L1 while listening to music increased, scores on the incongruent category of the cloze task decreased.

4 CONCLUSION

In this study, the comprehension of English collocations in bilingual Spanish-English college students was investigated. Previous empirical findings on collocation knowledge included participants who were currently learning a second language or had learned their second language as adults. The current study included adults who had learned both English and Spanish during childhood, before the age of 6. Across all participants, proficiency in English across domains of speaking, understanding, and reading were probed. Participants were highly proficient in English according to self-report. When examining whether English proficiency impacted participants' ability to interpret collocations in English and Spanish, there were significant correlations identified for some cloze task scores but not for translation task scores. Similarly, when examining the impact of collocation type, there were significant correlations across all categories of collocations for the cloze task only. The cloze task was presented in English.

A better understanding of which translation strategies Spanish-English bilingual college students used when translating collocations was explored. Overall, 78.1% of participants provided a correct translation to target collocations across all categories. Importantly, this suggests that approximately 20% of target collocations did not reflect the target. This is a relatively high number considering these are participants with high levels of education and who have rated their proficiency of English to be high.

Equivalence, defined as “explaining the same message through different structure and means, (Vinay & Darbelnet, 1995)” was the most used translation strategy at 9.21%. Previous literature has shown that literal translations were most frequently used, and equivalence or synonymous translations were the second most frequently used strategy (Dastmard, Gowhary &

Azizifar, 2016; Dweik & Shakra, 2010; Bahns & Eldaw, 1993; Shraideh & Mahadin, 2015). Traditionally, the equivalence translation strategy has been characterized by speakers as a strategy to make the translation more natural in the target language (Molinero, 2016). Therefore, current participants' usage of equivalence may in part be due to social costs or the evolution of language. For example, Spanish speakers now refer to overweight people as 'persona con sobrepeso' instead of 'persona gorda' because of social changes that encourage use of 'person first' language. Therefore, maybe some common collocations may be outdated and not as commonly used in current social settings. In addition, participants rated themselves as highly proficient in English which may suggest that they are able to provide equivalent translations, and do not need to depend upon literal translations, as may be the case for informants who don't have high proficiency in English. Most of the literature on collocations focused on participants who had acquired English in adulthood, and therefore may not have the same language experience as the participants in this study who learned English before the age of 6. The participants in these studies relied heavily on literal translations.

When looking at collocation congruency, congruent collocations had the highest percentage of target collocations translated correctly, with 40% correct translations provided. Congruent collocations are defined as collocations that have literal translation equivalents between English and Spanish. These findings were not surprising and were supported by the literature, which shows that the majority of L2 learners process congruent collocations quicker and more accurately (Dings & Reynolds, 2019; Peters, 2016). On the other hand, incongruent collocations had a lower percentage of target collocations translated correctly, with 31% correct translations provided. Incongruent collocations are defined as collocations that have no literal translation equivalents. The equivalence translation strategy was used frequently in this category, at 56%.

This suggests that participants who may not have known the specifically targeted collocation, were still able to use their cross-linguistic abilities in English and Spanish to determine an appropriate equivalent collocation.

Finally, Ambiguous collocations had the highest percentage of incorrect translations, with 57% translated incorrectly. Ambiguous collocations are English language collocations rendered in Spanish literally and are not appropriate translations for Spanish native speakers. For example, ‘doing the dishes’ would be translated literally as ‘haciendo los platos’ which is inappropriate Spanish. Native Spanish speakers would say ‘lavando los platos,’ which means ‘washing the dishes.’ Ambiguous collocations are a new category of collocations, not presented in the literature. This category is unlike congruent and incongruent categories, because participants must rely only on their knowledge of the English collocations to translate these sentences. Participants were not able to use their Spanish language knowledge, because the Spanish collocation was inappropriate and did not hint at the English translation.

In this category, the calque translation strategy was used most frequently. Calque strategies are literal translations at the phrase-level. This strategy was not used in any other collocation category. This finding suggests that cross-linguistic capabilities of participants may be needed in order to translate between both English and Spanish when collocations are ambiguous. Unlike congruent collocations which are transparent and therefore much easier to translate, ambiguous collocations were inappropriate in Spanish and unknown in English and therefore did not provide a scaffold for native Spanish speakers. In this case neither a literal nor an equivalent response was possible. Furthermore, even though participants rated themselves highly on English proficiency, these findings suggest that at least in some cases, they may rely on both their English and Spanish to translate collocations. In particular, when they are faced with a Spanish

translation that is inappropriate, they cannot use the context clues in Spanish to facilitate their understanding or comprehension of the collocation in English.

Finally, the relationship between collocation comprehension and English and Spanish learning contributors and current exposure was examined. Current exposure and learning domains were all significantly different between those whose L1 was Spanish vs. English (See Table 7 and 8). Specifically, current exposure and the learning contributors in English and Spanish between friends, family, reading, TV, and music were all significantly different between participants whose L1 was Spanish vs. English. This is supported by the literature, that has stated 25% of bilingual Spanish speakers in the U.S. are exposed to a language other than English at home (Ramirez & Kuhl, 2016). Similarly, the way Spanish-English bilinguals speak to their friends or interact with media is different across their two languages.

When looking at contributors to learning English and Spanish, there was only one significant correlation in the cloze task and L1: music, with a moderate negative correlation. This indicated that as ratings for music as a contributor to learning L1 increased, scores on the cloze task decreased. Using music as an instructional tool for learning and supporting one's native language has been extensively used and argued to be a good mechanism (Bartle, 1962; Jolly, 1975; Griffiee, 1992). However, the findings in this study do not support these claims, and it may be because the cloze task was in English and the majority of L1 learning contributors are in Spanish.

There was a small positive correlation between the translation task and family's contribution to learning L2. This indicated that as ratings for family as a contributor to learning L2 increased, so did overall scores on the translation task. This may be due to participants growing up as emergent bilinguals, or children who grow up in households with family members

who may be English–Spanish bilingual and/or Spanish dominant (Garcia, 2009). Families support both languages in the home, and therefore experiences with cross-linguistic translation may be supported earlier on during language development.

When looking at current exposure to English and Spanish, there were no significant correlations between scores on the cloze or translation tasks. This differed from the literature, which has suggested that there are moderate correlations between engagement in English and collocation knowledge in Spanish-English bilinguals (Fernandez & Schmitt, 2015).

However, when looking at current exposure across collocation categories there were significant negative correlations in congruent translation, ambiguous cloze, ambiguous translation, and incongruent cloze tasks. That is, as participant ratings of current exposure in English or Spanish increased, scores in these categories decreased. Therefore, overall engagement with English for participants who learned both languages in childhood may not be a significant contributor to collocation knowledge, but rather the type of collocation may make it easier, or harder, to use contextual cues based on language experience.

4.1 Limitations

This study had a few limitations. Most of the data collected were through online experimental tasks, and self-report. Using face-to-face assessment of collocation comprehension and interviews would add another interactional dimension to the data collection, which might support/influence outcomes for participants. Using face-to-face assessment would also allow for administration of additional reading and language assessments to better understand the language and reading backgrounds of participants. Most participants were female, and nearly all were highly educated college students. This is not representative of the normal Spanish-English bilingual population in the United States. In 2019, The United States Census reported that 81%

of Hispanic people have less than a bachelor's degree and are disproportionately poor. Differences by educational level and SES are likely, as collocational knowledge is gained through exposure that is most likely to occur outside of the home and community. Gender differences may also exist.

4.2 Future Research

Research on collocations with true bilingual speakers is still in the beginning stages. Most research samples are college-aged students or adults learning a second language, and thus these samples are not diverse. Further investigation should focus on younger populations, or groups of people without a college education. Looking at a younger population would allow for a developmental lens and provide insight on age of acquisition and exposure to various collocations. The population assessed in this study was highly educated females, and not reflective of the normal Spanish-English bilingual population. Future studies should look at differences between males and females because exposure to collocations may be different due to the nature of the work environments or experiences each sex may have. Also, establishing and developing a methodology to better assess collocation knowledge in speakers of English and Spanish is necessary. Experimental tasks used in this study were developed through adaptations of previous literature which did not focus on true bilingual speakers. Performances on the ambiguous task and use of calque as a strategy suggest that speakers who have strong use of two languages likely rely on both languages to respond to collocations that are unclear to them. Future research to clarify the influence of ambiguity in true Bilingual speakers seems important to pursue.

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APPENDICES

Appendix A: List of Activities and Language Used

<i>Activity</i>	<i>Language Used</i>
<p><i>Instructions to Participants</i></p> <p><i>Translation Task Instructions: The following section of the survey will provide you with a sentence written in Spanish. To the best of your ability translate that sentence into English so that both the Spanish sentence and the English sentence mean the same thing.</i></p> <p><i>Cloze Task Instructions: The following section of the survey will provide you with a sentence in English. The sentence has a missing target word. To the best of your ability provide <u>one word</u> that best completes the sentence.</i></p>	<i>English</i>
<i>Cloze Task</i>	<i>English</i>
<i>Translation Task</i>	<i>Spanish</i>
<i>Questionnaire</i>	<i>English</i>
<i>WM Passage Comprehension Subtest</i>	<i>Spanish</i>

Appendix B: LEAP-Q Questionnaire

1. What is your LAST name?
2. What is your FIRST name?
3. What is your age?
4. What is your birth date? (MM/DD/YEAR)
5. What do you identify with the most?
 - a. Male
 - b. Female
 - c. Transgender Female
 - d. Nonbinary
 - e. Prefer not to answer.
6. Please list all the languages you know in order of acquisition (your native language first):
 - a. First Language:
 - b. Second Language:
 - c. Third Language:
7. Please list what percentage of time you are currently and on average exposed to each language. (Your percentage should add up to 100%):
 - a. First Language:
 - b. Second Language:
 - c. Third Language:
8. 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 that the original was written in another language, which is unknown to you. (Your percentages should add up to 100%):
 - a. First Language:
 - b. Second Language:
 - c. Third Language:
9. 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? Please report percent of total time. (Your percentages should add up to 100%):
 - a. First Language:
 - b. Second Language:
 - c. Third Language:
10. Please name the cultures with which you identify. On a scale from zero to ten, please rate the extent to which you identify with each culture. (Examples of possible cultures include US-American, Cuban American, Ecuadorian-American.):
 - a. 0 = no identification
 - b. 1 = very low identification
 - c. 5 = moderate identification
 - d. 10 = complete identification
11. Please check your highest education level (or approximate US equivalent to a degree obtained in another country):
 - a. High School
 - b. Professional Training
 - c. Some College
 - d. College

- e. Some Graduate School
 - f. Master's Degree
 - g. Ph.D./M.D./J.D.
12. Date of Immigration to the USA, if applicable:
13. If you ever immigrated to another country besides the U.S., please provide name of country.
- a. Name of Country:
14. Answer each question with the age that BEST applies to that language.
- a. First Language
 - i. Began acquiring this language
 - ii. Became fluent in this language
 - iii. Began reading in this language
 - iv. Became fluent in reading in this language
 - b. Second Language
 - i. Began acquiring this language
 - ii. Became fluent in this language
 - iii. Began reading in this language
 - iv. Became fluent in reading in this language
15. Please list the number of years or months you spent in each language environment:
- a. First Language:
 - i. A country where this language is spoken
 - ii. A family where this language is spoken
 - iii. A school/work environment where this language is spoken
 - b. Second Language:
 - i. A country where this language is spoken
 - ii. A family where this language is spoken
 - iii. A school/work environment where this language is spoken
16. Please select your level of proficiency in speaking in each of your languages (range from 0=None 1=Very Low 2= Low 3=Fair 4=Slightly less than adequate 5=Adequate 6=Slightly more than adequate 7=Good 8=Very Good 9= Excellent 10=Perfect).
- a. First Language:
 - b. Second Language:
17. Please select your level of proficiency in understanding spoken language in each of your languages (range from 0=None 1=Very Low 2= Low 3=Fair 4=Slightly less than adequate 5=Adequate 6=Slightly more than adequate 7=Good 8=Very Good 9= Excellent 10=Perfect)
- a. First Language:
 - b. Second Language:
18. Please select your level of proficiency in reading in each of your languages (range from 0=None 1=Very Low 2= Low 3=Fair 4=Slightly less than adequate 5=Adequate 6=Slightly more than adequate 7=Good 8=Very Good 9= Excellent 10=Perfect)
- a. First Language:
 - b. Second Language:
19. Please rate how much interacting with friends contributed to you learning any of your languages (asked for First Language and Second Language):
- a. 0 = Not a contributor
 - b. 1 = Minimal contributor

- c. 5 = Moderate contributor
 - d. 10 = Most important contributor
20. Please rate how much interacting with family contributed to you learning any of your languages (asked for First Language and Second Language):
- a. 0 = Not a contributor
 - b. 1 = Minimal contributor
 - c. 5 = Moderate contributor
 - d. 10 = Most important contributor
21. Please rate how much reading contributed to you learning any of your languages (asked for First Language and Second Language):
- a. 0 = Not a contributor
 - b. 1 = Minimal contributor
 - c. 5 = Moderate contributor
 - d. 10 = Most important contributor
22. Please rate how much watching T.V. contributed to you learning any of your languages (asked for First Language and Second Language):
- a. 0 = Not a contributor
 - b. 1 = Minimal contributor
 - c. 5 = Moderate contributor
 - d. 10 = Most important contributor
23. Please rate how much listening to the radio or streaming music contributed to you learning any of your languages (asked for First Language and Second Language):
- a. 0 = Not a contributor
 - b. 1 = Minimal contributor
 - c. 5 = Moderate contributor
 - d. 10 = Most important contributor
24. Please rate to what extent you are currently exposed to each of your languages while interacting with friends (asked for First Language and Second Language):
- a. 0 = No exposure
 - b. 1 = Minimal exposure
 - c. 5 = Moderate exposure
 - d. 10 = Always exposed
25. Please rate to what extent you are currently exposed to each of your languages while interacting with family (asked for First Language and Second Language):
- a. 0 = No exposure
 - b. 1 = Minimal exposure
 - c. 5 = Moderate exposure
 - d. 10 = Always exposed
26. Please rate to what extent you are currently exposed to each of your languages while watching T.V. (asked for First Language and Second Language):
- a. 0 = No exposure
 - b. 1 = Minimal exposure
 - c. 5 = Moderate exposure
 - d. 10 = Always exposed
27. Please rate to what extent you are currently exposed to each of your languages while listening to radio/streaming music (asked for First Language and Second Language):

- a. 0 = No exposure
 - b. 1 = Minimal exposure
 - c. 5 = Moderate exposure
 - d. 10 = Always exposed
28. Please rate to what extent you are currently exposed to each of your languages while reading (asked for First Language and Second Language):
- a. 0 = No exposure
 - b. 1 = Minimal exposure
 - c. 5 = Moderate exposure
 - d. 10 = Always exposed
29. In your perception, how much of a foreign accent do you have in your languages (Asked for First Language and Second Language)?
- a. 0 = None
 - b. 1 = Almost None
 - c. 5 = Some
 - d. 10 = Pervasive
30. How frequently do others identify you as a non-native speaker based on your accent in your languages:
- a. 0 = Never
 - b. 1 = Almost Never
 - c. 5 = Half of the time
 - d. 10 = Always

Appendix C: Collocations and Experimental Tasks

Item	Target	Cloze	Translation
1	Keep + Diary	He decided to <u>keep</u> a diary to remember his college days in the future.	Mientras estaba en la escuela decidí mantener un diario.
2	Do + Dishes	I wanted to <u>do</u> the dishes before I went out to the party.	Ella quería hacer los platos cuando termino sus estudios.
3	Spend + Time	After the meeting, he wanted to <u>spend</u> time with his largest donors.	Quiero gastar el tiempo contigo en el parque.
4	Paid + Attention	I <u>paid</u> attention to the speaker when he said this would help me during my test.	Cuando la maestra está hablando debes prestar atención.
5	Change + Mind	The bride <u>changed</u> her mind about her wedding dress.	Cambio su mente sobre qué restaurante quería comer.
6	Gave + Speech	He <u>gave</u> a speech about the importance of following the guidelines.	El dio un discurso en la boda de su hermano.
7	Lost + Job	Europe <u>lost</u> jobs in the beginning of the year.	El perdió el trabajo porque no estaba disponible esa semana.
8	Drop + Subject	I will <u>drop</u> the subject if I notice it is upsetting him.	Suelto el tema si no sabe de lo que estoy hablando.
9	Save + Seat	My friend asked me to <u>save</u> a seat for her.	Le dije que me guardara un asiento
10	Come + Conclusion	The jury came to a conclusion that the defendant was guilty.	El llego a la conclusión que no quiere salir esta noche.
11	Catch + Eye	The artists knew his painting would <u>catch</u> someone's eye in the auction.	Ella sabía que su maquillaje llamaría la atención de alguien en el baile.
12	Catch + Cold	I did not want to <u>catch</u> a cold this season so I will take my vitamins.	El doctor dice que tomas tus vitaminas para no atrapar un frio.
13	Break + News	I wanted to <u>break</u> the news about my acceptance during family dinner.	Yo quería dar la noticia de mi oferta de trabajó durante la fiesta.
14	Do + Homework	He wanted to <u>do</u> homework before his shift at work began that evening.	Él quería hacer la tarea en la biblioteca.
15	Keep + Change	The customer told me to <u>keep</u> the change.	Yo no quiero mantener el cambio.
16	Take + Notes	You should <u>take</u> notes to remember the important highlights.	Tú puedes tomar notas durante la conferencia.
17	Raise + Hand	The students always <u>raise</u> their hands during the lesson.	No olvides levantar la mano si estas confundido.
18	Spend + Night	They wanted to <u>spend</u> the night at the hotel after their long drive.	Si estas cansado puedes gastar la noche.
19	Took + Break	The teacher <u>took</u> a break after the parent meeting.	Usted puede tomar un descanso después de terminar tu turno.

20	Took + Care	The babysitter <u>took</u> care of the baby on Saturday nights.	Yo cuide mi abuela cuando mi mama estaba en el trabajo.
21	Take + Walk	I want to <u>take</u> a walk after dinner.	Las niñas tomaron una caminata por el parque.
22	Earn + Money	I wanted to <u>earn</u> money on social media.	Yo quiero ganar dinero haciendo lo que me gusta.
23	Have + Coffee	I like to <u>have</u> coffee before I get to work each morning.	Los colegas tuvieron un café por la tarde.
24	Open + Heart	She was willing to have an <u>open</u> heart about the situation.	La próxima vez leería la historia con el corazón abierto.
25	Close + Mind	She said he would never understand because he approached the situation with a <u>closed</u> mind.	Si tienes una mente cerrada no entenderás su perspectiva.
26	Clean + Clothes	You need to have <u>clean</u> clothes if you want to <u>go to the party</u> .	Usted debe tener ropa limpia lista para viajes espontáneos.
27	Broken + Bone	Before the game began, she notified her coach that she had a <u>broken</u> bone.	Él tenía un hueso roto de la última competencia.
28	Took + Advantage	She <u>took</u> advantage of the free test preparation session after school.	El aprovechó las sesiones de tutoría gratuitas en la biblioteca.
29	Shook + Hands	She <u>shook</u> hands with the ambassador before the meeting began.	El sacudió la mano de todos en la habitación.
30	Break + Bill	I asked her if she had change to <u>break</u> the bill.	Necesitaba cambio para el tren, así le dije que rompiera la cuenta.
	Incongruent	No literal L1 translation equivalent (10)	
	Congruent	Literal L1 translation equivalent available (10)	
	Ambiguous	Forced L1 translation equivalent (10)	

Appendix D: Proficiency in English between L1 in Spanish vs. English

Table 2. Proficiency in English between L1 in Spanish vs. English

	Mean	SD
L1=Spanish		
Speaking Proficiency	8.90	1.152
Understanding Proficiency	9.24	1.033
Reading Proficiency	9.13	1.113
L1=English		
Speaking Proficiency	9.36	.731
Understanding Proficiency	9.68	.548
Reading Proficiency	9.43	.742

Note. N=142. Proficiency across domains in English only.

Appendix E: Correlations between Collocation Tasks and English Proficiency Domains

Table 3. Pearson Correlations between Collocation Tasks and English Proficiency Domains.

	1	2	3	4	5
1. Cumulative Cloze Task	-				
2. Cumulative Translation Task	.091	-			
3. Speaking Proficiency	.257**	.091	-		
4. Understanding Proficiency	.257**	.003	.565**	-	
5. Reading Proficiency	.269**	.102	.655**	.652**	-

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Table 4. Pearson Correlations between Collocation Categories and English Proficiency Domains.

	1	2	3	4	5	6	7	8	9
1. CC	-								
2. CT	.026	-							
3. AC	.366**	.127	-						
4. AT	.051	.279**	.115	-					
5. IC	.285**	.011	.422**	-.074	-				
6. IT	-.091	.285**	.078	.191*	.115	-			
7. SP	.154	.068	.169*	.080	.223**	.042	-		
8. UP	.116	-.040	.159	.038	.298**	-.011	.565**	-	
9. RP	.165*	.059	.201	.071	.270**	.085	.655**	.652**	-

Note. CC=Congruent Cloze, CT=Congruent Translation, AC=Ambiguous Cloze, AT=Ambiguous Translation, IC=Incongruent Cloze, IT=Incongruent Translation, SP=Speaking Proficiency, UP=Understanding Proficiency, RP=Reading Proficiency

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Appendix F: Frequency and Utilization of Translation Strategies

Table 5. Total Frequency and Percentage of Utilization of Translation Strategies

No.	Strategies Used	Correct	Incorrect	Equivalence	Literal	Calque	Transposition	Adaptation	Modulation
	Collocation								
1	Keep + diary	107	1	7	15	0	5	0	0
2	Do + dishes	81	7	37	4	0	0	0	0
3	Spend + time	86	0	4	52	0	0	0	0
4	Paid + attention	138	0	1	3	0	0	0	0
5	Change + mind	142	0	0	0	0	0	0	0
6	Gave + speech	138	0	3	1	0	0	0	0
7	Lost + job	142	0	0	0	0	0	0	0
8	Drop + subject	55	23	23	41	0	0	0	0
9	Save + seat	136	0	1	1	0	0	3	1
10	Come + conclusion	94	15	1	26	0	6	0	0
11	Catch + eye	42	4	58	23	3	0	0	0
12	Catch + cold	103	4	35	0	0	0	0	0
13	Break + news	6	5	56	75	0	0	0	0
14	Do + homework	140	2	0	0	0	0	0	0
15	Keep + change	103	6	13	20	0	0	0	0
16	Take + notes	140	0	1	1	0	0	0	0
17	Raise + hand	141	1	0	0	0	0	0	0
18	Spend + night	72	22	11	37	0	0	0	0
19	Took + break	124	1	17	0	0	0	0	0
20	Took + care	139	2	1	0	0	0	0	0
21	Take + Walk	120	1	21	0	0	0	0	0
22	Earn + money	51	7	75	9	0	0	0	0
23	Have + coffee	121	4	13	4	0	0	0	0
24	Open +heart	129	3	0	0	0	10	0	0
25	Close + mind	139	3	0	0	0	0	0	0
26	Clean + clothes	136	6	0	0	0	0	0	0
27	Broken + bone	134	2	6	0	0	0	0	0
28	Took + advantage	132	7	2	1	0	0	0	0
29	Shook + hands	126	8	0	8	0	0	0	0
30	Break + bill	85	16	0	1	40	0	0	0
	Total	3302	150	386	322	43	21	3	1
	Total Percentage	78.1	3.5	9.21	7.6	1	.5	.07	.02

Note. Strategies ordered from most frequent to least.

Table 6. Frequency and Percentage of Utilization of Translation Strategies across categories

N o.	Collocation Category (% use across categories)	Congruent	Incongruent	Ambiguous	Total Frequency across Categories
	Strategies Used				
1	Correct	1317 (40%)	994 (31%)	991 (29%)	3302
2	Incorrect	33 (22%)	32 (21%)	85 (57%)	150
3	Literal	27 (8%)	148 (47%)	147 (45%)	322
4	Equivalence	27 (7%)	215 (56%)	144 (37%)	386
5	Calque	0	3 (7%)	40 (93%)	43
6	Transposition	16 (76%)	5 (24%)	0	21
7	Modulation	0	1 (100%)	0	1
8	Adaptation	0	3 (100%)	0	3

Note. Strategies ordered from most frequent to least. Percent use is across categories.

Appendix G: Paired-Samples *t* tests for L1 and L2 Speaker Characteristics

Table 7. Paired-Samples t Test for L1 and L2 learning contributors.

	Mean	Std Dev	S.E. mean	Paired <i>t</i> test		
				<i>t</i> value	<i>df</i>	Sig (two-tailed)
L1 Friend	5.97	3.637	.306	-3.749	140	.001
L2 Friend	7.38	3.255	.274			
L1 Family	9.10	2.187	.184	8.363	141	.001
L2 Family	5.44	3.926	.329			
L1 Reading	6.99	3.282	.276	-2.090	140	.038
L2 Reading	7.68	2.994	.252			
L1 TV	6.38	3.417	.288	-3.895	140	.001
L2 TV	7.59	3.017	.254			
L1 Music	6.45	3.583	.302	-2.447	140	.016
L2 Music	7.11	3.102	.261			

Table 8. Paired-Samples t Test for L1 and L2 current exposure.

	Mean	Std Dev	S.E. mean	Paired <i>t</i> test		
				<i>t</i> value	<i>df</i>	Sig (two-tailed)
L1 Friend	6.51	3.130	.264	-4.043	140	.001
L2 Friend	8.16	2.770	.233			
L1 Family	9.07	1.819	.153	9.133	140	.001
L2 Family	5.76	3.378	.285			
L1 Reading	5.32	3.534	.297	-6.050	141	.001
L2 Reading	8.18	2.954	.248			
L1 TV	5.67	3.579	.301	-5.886	140	.001
L2 TV	8.16	2.703	.228			
L1 Music	7.45	2.872	.241	-2.640	141	.009
L2 Music	8.27	2.447	.205			

Appendix H: Correlations of Speaker Characteristics

Table 9. Pearson Correlations of L1 and L2 learning contributors across both tasks.

	1	2	3	4	5	6	7	8	9	10	11	12
1. CC	-											
2. CT	.091	-										
3. L1 FR	-.061	-.050	-									
4. L2 FR	-.066	-.077	.170*	-								
5. L1 FAM	-.034	.041	-.037	.174*	-							
6. L2 FAM	.084	.175*	.231**	-.118	-.403**	-						
7. L1 R	-.099	.086	.498**	.017	-.003	.194*	-					
8. L2 R	-.020	.108	.103	.599*	.194*	-.042	.210*	-				
9. L1 TV	-.166	-.010	.474**	.102	-.086	.094	.517*	.186*	-			
10. L2 TV	-.038	-.007	.165	.568*	.065	.005	.116	.570*	.345*	-		
11. L1 M	-.268**	-.077	.485**	.205*	-.050	.038	.364*	.212*	.663*	.309*	-	
12. L2 M	-.100	-.060	.324	.379*	.042	.120	.257*	.366*	.419*	.619*	.550*	-

Note. CC=Cumulative Cloze, CT=Cumulative Translation, FR=Friends, FAM=Family, R=Reading, TV=Television, M=Music

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Table 10. Pearson Correlations of L1 and L2 learning contributors across collocation categories.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. CC	-														
2. CT	.026	-													
3. AC	.366**	.127	-												
4. AT	.051	.279**	.115	-											
5. IC	.285**	.011	.442**	-.074	-										
6. IT	-.091	.285**	.078	.191*	.115	-									
7. L1 FR	-.060	-.068	-.074	-.028	-.005	-.018	-								
8. L2 FR	-.102	-.116	-.067	-.033	.022	-.033	.170*	-							
9. L1 FAM	-.113	-.046	-.086	.021	-.063	.101	-.037	.174*	-						
10. L2 FAM	.060	.121	.069	.199*	.107	.032	.231**	-.118	-.403	-					
11. L1 R	-.021	.049	-.059	.069	-.189*	.060	.498**	.017	-.003	.194*	-				
12. L2 R	-.014	-.066	.062	.181	-.100	.063	.103	.599**	.194*	-.042	.210*	-			
13. L1 TV	-.041	.010	-.228**	.070	-.136	-.119	.474**	.102	-.086	.094	.517**	.186*	-		
14. L2 TV	-.110	-.157	.018	.069	.026	.024	.165	.568**	.065	.005	.116	.570**	.345**	-	
15. L1 M	-.141	-.041	-.230**	.030	-.124**	-.174*	.485**	.205*	-.050	.038	.354**	.212*	.663**	.309**	-
16. L2 M	-.064	-.067	-.066	-.002	-.078	-.075	.324**	.379*	.042	.120	.257**	.366**	.419**	.619**	.550**

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Note. CC=Congruent Cloze, CT=Congruent Translation, AC=Ambiguous Cloze, AT=Ambiguous Translation, IC=Incongruent Cloze, IT=Incongruent Translation FR=Friends, FAM=Family, R=Reading, TV=Television, M=Music

Table 11. Pearson Correlations of L1 and L2 current exposure across collocation categories.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. CC	-														
2. CT	.026	-													
3. AC	.366**	.127	-												
4. AT	.051	.279**	.115	-											
5. IC	.285**	.011	.442**	-0.74	-										
6. IT	-.091	.285**	.078	.191*	.115	-									
7. L1 FR	.031	.079	-.166*	-.082	-.062	-.039	-								
8. L2 FR	-.003	-.108	.061	.048	.073	.123	-.340**	-							
9. L1 FAM	.066	-.012	-.080	.019	.004	.100	-.032	.416**	-						
10. L2 FAM	.048	.112	.067	.201*	-.028	.015	.255**	-.073	-.311**	-					
11. L1 R	-.022	.167*	-.137	.061	-.105	-.104	.616**	-.436**	-.196*	.308**	-				
12. L2 R	-.030	-.188*	.018	.041	-.041	.051	-.372**	.736**	.428**	-.217**	-.495**	-			
13. L1 TV	.003	.132	-.135	.060	-.147	-.054	.471**	-.266	-.088	.256**	.616**	-.366**	-		
14. L2 TV	-.020	-.185*	.113	-.089	.046	.080	-.308**	.700**	.368**	-.150*	-.352**	.720**	-.257**	-	
15. L1 M	.028	.145	-.073	-.049	-.175*	-.043	.466**	-.157	-.026	.142	.463**	-.235**	.500**	-.159	-
16. L2 M	-.082	.002	.090	.090	.041	.157	-.177*	.535**	.254**	.002	-.137	.456**	-.101	.608**	.029

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Note. CC=Congruent Cloze, CT=Congruent Translation, AC=Ambiguous Cloze, AT=Ambiguous Translation, IC=Incongruent Cloze, IT=Incongruent Translation FR=Friends, FAM=Family, R=Reading, TV=Television, M=Music

Table 12. Significant Pearson Correlations on learning contributors in all conditions

	1	2	3	4	5	6
1. CC						
2. CT						
3. AC						
4. AT						
5. IC						
6. IT						
7. L2 FAM		.175*		.199*		
8. L1 R					-.189*	
9. L1 TV			-.228**			
10. L1 M	-.268**		-.230**		-.124**	-.174*

Note. CC=Cumulative Cloze, CT=Cumulative Translation, AC= Ambiguous Cloze, AT= Ambiguous Translation, IC=Incongruent Cloze, IT=Incongruent Translation, FAM=Family, R=Reading, TV=Television, M=Music

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).