Idiom Comprehension In Bilingual And Monolingual Adolescents

by

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Idiom Comprehension in Bilingual and Monolingual Adolescents

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ABSTRACT

A majority of Latino adolescents are reading below a proficient level, according to federal data, and there is a significant gap between overall reading proficiency of Latino and non-Latino, Caucasian adolescents. The purpose of this study was to investigate the linguistic underpinnings of Latino students’ text comprehension. A positive relationship appears to exist between idiom comprehension and academic achievement, as well as idiom comprehension and reading comprehension, in typically developing, monolingual adolescents. Since reading comprehension and idiom comprehension share many of the same linguistic processes, idiom comprehension may provide a unique perspective for investigating Latino adolescents’ reading comprehension.

Using the Global Elaboration Model (GEM, Levorato, Nesi, & Cacciari, 2004) as the conceptual framework, the present study examined the relationship between idiom comprehension and reading comprehension with a population that had not been studied in this manner: bilingual (Spanish-English) adolescents in West Central Florida and their monolingual (English-only) peers. The GEM posits that idiom comprehension develops in tandem with other linguistic development requiring inferencing ability; and that idiom
comprehension ability can be predicted by reading comprehension ability. The present research design included the evaluation of idiomatic familiarity, semantic transparency, and contextual support, as well as three other linguistic measures: a) a reading comprehension task, b) an error detection task, and c) a synonym task.

Results indicated that the three linguistic measures predicted 33% of the variance in idiom comprehension accuracy; and error detection was the strongest predictor of idiom comprehension accuracy. Furthermore, monolinguals outperformed bilinguals on all measures. The synonym task, a measure of lexical depth, best predicted language group membership. There was a three-way interaction among idiomatic familiarity, semantic transparency, and contextual support; and a three-way interaction among familiarity, transparency, and language group. Lastly, the three linguistic measures significantly predicted the bilinguals’ amount of English experience, with qualitative differences emerging between sequential and simultaneous language learners. Findings lend support to the psychological reality of the GEM and provide insight into the linguistic foundations of reading comprehension in Spanish-English bilinguals.
Chapter One

Introduction

The Latino population is the fastest growing population in the United States. This population is expected to increase from 35.3 million in 2000 to 60.4 by 2020 (Suro et al., 2005). Latinos now represent 19 percent of the U.S. school-age population, an increase from 12.7 percent from 1993 (Kohler & Lazarín, 2007). Latino English language learners (ELLs) comprise the largest group of ELLs (Koelsch, 2006). Federal data on the bilingual school-age population demonstrate that a gap exists in English reading proficiency between Latino students and Caucasian, non-Latino students. For example, results from the 2005 National Assessment of Educational Progress (NAEP) (United States Department of Education (USDOE), National Center for Educational Statistics (NCES), 2006) showed a 25 point score gap at grade 8 between Latino and Caucasian, non-Latino students. Although this gap has narrowed somewhat since 2003 (i.e., a 27 point score gap existed in 2003), the breadth of the gap remains, and continues to maintain itself in the 2007 Reading Report Card (USDOE, NCES, The Nation’s Report Card, 2007).

Furthermore, the Nation’s Report Card (USDOE, NCES, 2007) showed a 21 point gap between Latinos and non-Latino Caucasians in grade 12 in 2005, up from a 20 point gap in 2002 and a 19 point gap in 1992. Nationwide, according to the 2005 NAEP results,
only 20 percent of Latinos in grade 12 are reading at a proficient level. In contrast, 43 percent of non-Latino Caucasians in grade 12 are reading at a proficient level (USDOE, NCES, 2007). The proficient achievement level is described in part as being “…able to show an overall understanding of the text, including inferential as well as literal information” (USDOE, NCES, The Nation’s Report Card, 2006, p. 29).

In Florida, the 2007 NAEP reading scores indicated that only 26 percent of Latino students in the 8th grade were able to read at a proficient level (USDOE, NCES, Nation’s Report Card, 2007). One example of a critical reading activity on this assessment for grade 8 was to read a passage describing new immigrants’ experiences at Ellis Island during the 19th century. Following the passage, students were to write a response to the following question: What two experiences might have caused the new immigrants to say that they felt like cattle? This sample question underscores the necessity of students’ ability to make accurate literal and figurative inferences in order to achieve at the proficient level at grade 8.

The reading achievement of Latino students whose first language is not English is correlated with diminished academic skills beginning as early as grade 3 (Jiménez, 1994). Unfortunately, this negative relationship continues throughout the academic careers of these second language learners (Jiménez, 1994). Because of the No Child Left Behind Act (NCLB, 2002), many states (such as Florida) are requiring all students to pass a standardized reading comprehension measure as an exit requirement for high school graduation. Thus, negative correlations between Latino students whose first language is not English and their reading achievement suggests that Latino adolescents may be at risk for academic failure and subsequent high school drop out. With this type of
unresolved disparity in reading achievement between Latinos and Caucasian non-Latinos, Latino adolescents may drop out of high school at a higher rate than their Caucasian non-Latino counterparts. In fact, in 2004, of all high school drop outs ages 16 to 24, 23.5 percent were Latino Americans compared to 6.8 percent who were Caucasian non-Latino (USDOE, NCES, 2006). Overall, only 53 percent of Latinos in Florida (and nationwide) graduate from high school (Alliance for Education, 2007). Other NCES (USDOE, 2006) data show that the high school drop-out rate of Latino students born outside of the United States also remains higher (38.4 percent) than those Latinos who were born in the United States (first generation = 14.7 percent and second generation or higher = 13.7 percent).

Taken together, these data are evidence of how low reading proficiency, when considered as the ability to infer and integrate, puts the bilingual adolescent population at risk for failing mandatory state assessments, including those now required for high school graduation, and creates conditions for not completing high school. Because of these factors, it is crucial to understand the language processing skills necessary for these bilingual students to read more proficiently. One domain that provides a unique vantage point for examining the underpinnings of text comprehension is idiom comprehension.

Idioms, a type of non-literal, figurative language, such as *spill the beans*, are pervasive in classroom discourse and academic text books (Nippold, 1991). In monolingual English-speaking children, a positive relationship appears to exist between idiom comprehension and the level of reading comprehension at age 9 years (Cain, Oakhill, & Lemmon, 2005). A similar relationship was found between idiom comprehension and overall academic achievement in monolingual English-speaking adolescents (Nippold & Martin, 1989). A need currently exists to explore whether the
same relationship holds between idiom comprehension and reading proficiency in bilingual (Spanish-English) adolescents. Furthermore, reading comprehension and idiom comprehension appear to share similar cognitive-linguistic processes. Thus, insight into idiom comprehension may help to illuminate the underpinnings of reading comprehension as an inferential process in bilingual adolescents.

In this chapter the research literature on idiom comprehension is reviewed. Firstly, idioms are defined and the factors that affect idiom comprehension are discussed. Secondly, the theoretical frameworks for idiom comprehension in monolinguals are explored. Then, the development of idiom comprehension is reviewed in monolingual and cross-linguistic populations who are either typically-developing or cognitively/linguistically impaired, followed by an appraisal of the literature on adult bilinguals and idiom comprehension. Given this background information, possible relationships are elaborated on between idiom comprehension and reading comprehension with a focus on shared cognitive and linguistic underpinnings. Then the theoretical model developed for this study is presented. In the final section, three research questions associated with the study are outlined.

**Idioms: Relevance, Comprehension Factors, and Models**

Idioms are a subtype of the broader category of nonliteral, figurative language. Figurative language encompasses other nonliteral forms such as similes, metaphors, sarcasm, irony, indirect requests, and hints (Holtgraves, 2005). An idiom is a meaning where the sum’s meaning is different from that of the parts (Abkarian, Jones, & West, 1992; Johnson, Johnson, & Schlichting, 2004). Idioms may be interpreted differently from other figurative language, however. For example, similes are easier to understand
due to their inherent inclusion of the words like or as, which act as cues (Gentner, Bowdle, Wolff, & Boronat, 2001). Examples of similes include as bright as the sun and slow like a turtle. In addition, a metaphor (e.g., she is a snake) seems to be processed like an analogy, which is not always a possible solution for idiom comprehension since connections may be more opaque (Gentner et al., 2001). Furthermore, jokes and sarcasm are based on implicit meanings and more so on pragmatic variables (such as winking), as seen in children on the autism spectrum who have difficulty with this type of figurative language due to decreased pragmatic skills (Norbury, 2004).

The Pervasiveness of Idioms in Classrooms

Idioms are pervasive in most languages, but can be language specific or language general. For example, some idioms are historically traceable with translations in several languages, while others have developed from more colloquial pasts. For example, the Spanish idiom, no hay Moros en la costa, literally translates to there are no Moors on the coast. Figuratively, this idiom translates to the coast is clear in English, but anyone who knows the history between the Spanish Moors and Spanish Catholics can interpret a deeper meaning. Examples of North American English idioms include chip on your shoulder, back seat driver, and I wash my hands of it.

One study of the pervasiveness of idioms found that an idiom occurred in approximately 6.7% of all sentences in three frequently used reading texts in grades 3-8 (Nippold, 1991). Frequency of idiom usage increased through the grades with a range of 6% at grade 3 to 9.7% by grade 8 (Nippold, 1991). Lazar, Warr-Leeper, Nicholson, and Johnson (1989) similarly investigated idiom frequency in discourse used in kindergarten through grade 8 classrooms. Of 5400 teacher utterances, 11% contained at least one
idiom. This frequent use of idioms may be detrimental for children with language learning or cognitive impairments or those acquiring English as a second language. Whether idioms are spoken or written, at least three factors impact on idiom comprehension.

Three Major Factors Affecting Idiom Comprehension: Semantic Transparency, Familiarity, and Context

*Semantic transparency.* Semantic transparency refers to the relative correspondence of an idiom’s literal and figurative meanings (Nippold & Taylor, 1995). A transparent idiom’s meaning matches closely with the image conjured up by that idiom. For example, the idiom, *a piece of cake,* may conjure up an enjoyable task. In contrast, an opaque idiom conjures up an image that is not helpful in interpretation. For example, *beat around the bush* as a literal image has little to do with that idiom’s meaning (i.e., avoiding a topic of discussion). Semantic transparency can be viewed on a continuum. One end reflects a more superficial, literal correspondence and the opposite end reflects a deeper, more elusive and figurative correspondence. Previous studies have concluded that transparent idioms are generally easier to decipher than opaque idioms (Nippold & Taylor, 1995; Norbury, 2004).

Another way to discuss the transparency of idioms is in terms of their decomposition (Glucksberg, 2001), with a more decompositional idiom the meaning of each word adds up to the holistic meaning. Thus, each semantic part is more meaningful than meaningless. Furthermore, idioms that are decompositional are able to be modified, such as *he broke the ice, she breaks the ice, after the ice was broken,* etc. These modifications are possible since each part of the idiom is meaningful (Sprenger, Levelt,
& Kempen, 2006). For instance, break is associated with to end and ice is associated with tension. Noncompositional idioms cannot survive the same alterations. One example is the noncompositional idiom on the fly, which cannot be decomposed into on the flied (Glucksberg, 2001). In addition, decomposition ranges along a continuum. More decompositional idioms are likened to transparent idioms, and less decompositional idioms are equated with opaque idioms.

Familiarity. The frequency with which an idiom occurs in a language is often defined as familiarity (Nippold & Taylor, 1995); however, frequency and familiarity are both moderated by culture. Familiarity is relative and depends on such factors as geographical location, linguistic background (including dialect), culture, and age (Nippold & Rudinski, 1993). It appears that idiom comprehension is easier when an idiom is more familiar to someone because less conceptual analysis is required (Qualls & Harris, 1999). Exposure may play an important role in idiom comprehension since having more experience with idioms may make those idioms more salient (Norbury, 2004). Ultimately, more frequently used idioms may be more familiar.

Glucksberg (2001) described idioms as a secret language and a language owned by a culture that one has to be steeped in. In other words, idioms vary in frequency and familiarity depending on variables like demographic characteristics and cultural and linguistic identification. Ortony, Turner, and Larson-Shapiro (1985) formulated the experience hypothesis, which postulated that individuals’ idiom comprehension was dependent on their meaningful exposure to idioms. Later, Qualls and Harris (1999) expanded this hypothesis into the differential language experiential hypothesis to explain social and regional effects on idiom comprehension. For example, Qualls and Harris
(1999) found evidence for this hypothesis when investigating idiom comprehension in African Americans living in the southern part of the United States. Membership in a particular linguistic and cultural community was seen as an important variable in the familiarity of idioms (Qualls & Harris, 1999).

Context. Contextual cues are imperative for comprehension of unfamiliar idioms in either the oral or written modality, particularly if idioms are more opaque in nature (Qualls, O’Brien, Blood, & Hammer, 2003). Idioms presented orally are typically accompanied by both linguistic cues (e.g., surrounding words) and extralinguistic cues, such as intonation, stress, gestures, facial expressions, and social context. The ability to exploit context becomes even more important when extralinguistic cues are absent, such as in reading, where only linguistic contextual cues are available. Context appears to facilitate idiom comprehension more in older elementary school-age children and beyond (Levorato & Cacciari, 1992). Younger children (4- to 5-years-old) may have difficulty exploiting the surrounding linguistic context (Levorato, Nesi, & Cacciari, 2004).

Models of Idiom Comprehension

In the last several decades many researchers have speculated about how idioms are interpreted. During the 1970s and early 1980s several hypotheses were put forth with a focus on how idioms are stored and accessed in the lexicon. Then, in the 1990s, a shift occurred in the research literature with a new focus on how idioms were linguistically processed. The first hypotheses are elaborated on briefly followed by a discussion of subsequent linguistic processing models of idiom comprehension, specifically the model for this proposal.
Early hypotheses. In 1973 Bobrow and Bell created the Idiom List Hypothesis. A main assumption was that, when idioms are first encountered in spoken or written language, the listener or reader tries to interpret the idiom literally. When the literal meaning fails to make sense, the listener/reader then accesses a mental idiom list, described as a sort of mental idiom dictionary, in order to determine the figurative meaning (Searle, 1979).

Subsequently, Swinney and Cutler (1979) challenged the existence of a mental idiom list. Instead, they argued that idioms were considered as long words; that is, idioms were stored along side other words in the lexicon, not separately. Furthermore, Swinney and Cutler (1979) proposed that the meanings of idioms were processed simultaneously as figurative and literal. Through this process, the figurative and literal meanings compete and the most appropriate interpretation wins.

As an extension of Swinney and Cutler’s view, Gibbs (1980) also described idioms as being stored as long words in the lexicon. Gibbs (1980), however, refuted the competition theory in favor of the Direct Access Theory. As the theory’s name implies, the meanings of idioms were posited to be accessed directly and immediately, by-passing the literal meaning. In other words, the literal meaning was not the default meaning of all idiomatic language comprehension.

Linguistic representations hypotheses. A shift in conceptual frameworks occurred in the late 1980s in idiom comprehension study. The ideas of separate lexicons and of idioms being stored as long words were further challenged. One conjecture was that idioms were constructed by constituents or linguistic parts (Cacciari & Tabossi, 1988;
Tabossi & Cacciari, 1988). These constituent meanings (both literal and figurative) were simultaneously activated within one lexicon.

A similar perspective concurrently emerged, the Idiom Decompositionality Hypothesis (Gibbs & Nayak, 1989). This hypothesis focused on the significance of each constituent of an idiomatic phrase to create a meaningful phrase. In other words, the emphasis shifted to part-whole relationships, an emphasis that continued throughout the 1990s.

From linguistic hypotheses to models of language processing. The focus of the linguistic processing of idiomatic parts to create a meaningful whole was extended in the Composition Model (Gibbs, 1991, 1994; Tabossi & Zardon, 1995). In the Composition Model, idiom comprehension involved decompositional analysis at the semantic, syntactic, and lexical level, just like the analysis that occurred when any other phrase was encountered. Thus, Gibbs (1991) conjectured that not all idioms were noncompositional (e.g., kick the bucket). Instead, many idioms were decomposable or analyzable into their component parts (e.g., raining cats and dogs). Decomposition is now described as semantic transparency.

Around the same time as the development of the Composition Model (Gibbs, 1991, 1994; Tabossi & Zardon, 1995), Levorato and Cacciari (1992) and Levorato (1993) proposed the Global Elaboration Model. A premise of this model is that idiom comprehension develops in parallel with general cognitive and linguistic development through childhood. In other words, there is no idiom-specific process developed for idiom comprehension. However, an exception was hypothesized. Opaque idioms, whose meanings do not match the images they conjure in a one-to-one correspondence, were
learned via rote memory. For instance, the meaning of *kick the bucket* (i.e., to die) does not correspond with an image of someone literally kicking a bucket. Thus, this model encompasses both linguistic processing (of transparent idioms) and lexicalization (of opaque idioms).

Levorato et al. (2004) explained idiom comprehension through their expanded model of semantic analysis, the Global Elaboration Model. The degree of an idiom’s semantic analyzability is contingent on the relationship between the literal meaning of the idiom’s constituents and the idiom’s figurative meaning (Levorato, Roch, & Nesi, 2007). Semantic analysis is accomplished by analyzing an idiom’s constituents (i.e., linguistic parts) since an idiom’s constituents must be individually understood to create local coherence and then connected to generate global coherence. Unlike literal text comprehension, idiom comprehension required interpretation of the constituents’ literal and figurative meanings. The outcome was that a logical semantic representation had to be constructed from contextually appropriate meanings. These semantic representations were then integrated and compared with the speaker’s/writer’s intended meaning as conveyed in the idiomatic expression (Levorato et al., 2004).

The psychological reality of the Global Elaboration Model was tested through several studies with monolingual Italian-speaking or English-speaking, school-age children (Cain et al., 2005; Levorato et al., 2004; Levorato et al., 2007). Typical sample sizes have generally ranged from 22 to 101 participants. In these studies, there was a correlation between the ease of analysis (i.e., of analyzing constituents) and ease of comprehension. For instance, transparent idioms with a more direct relationship between the individual meanings of constituents and the overall figurative meaning were easier to
comprehend. The Global Elaboration Model posited that two processes are used when interpreting unknown idioms: semantic analysis and inference from context. Semantic analysis is only beneficial for transparent idioms and inference generation can only occur if there is context present. Moreover, local coherence occurs when each constituent’s appropriate meaning is accessed and understood. Global coherence results in one of two situations: when the meanings of local constituents directly corresponds with the figurative meaning (as in the case of transparent idioms) or when context and intended meaning are integrated with these constituent meanings to interpret the figurative meaning (in other words, opaque, unknown idioms). The process of interpreting an opaque idiom is illustrated in Figure 1. The figure illustrates the Global Elaboration
Model “at work”.

*Hear or read:* After being suspended from school and wrecking the family car, John knew that he was skating on thin ice with his parents.

![Diagram of local and global coherence of an idiomatic expression.](image)

*Figure 1.* Local and global coherence of an idiomatic expression.
It should be noted that one recent study did not find support for the Global Elaboration Model. Crutchley (2007) used the Non-literal Comprehension Subtest of the Assessment of Comprehension and Expression (ACE 6-11), which is made up of a forced-choice picture task and a written task, to analyze the responses of 789 monolingual English-speaking children, ages 6 - 11-years. The sample consisted of 121 6-year-olds, 136 7-year-olds, 136 8-year-olds, 133 9-year-olds, 145 10-year-olds, and 128 11-year-olds. Children were asked to choose one of four pictures that corresponded with a given idiomatic sentence for the first eight items. For the second set of eight items, children chose the correct interpretation of an idiomatic sentence from a set of four written choices (which the examiner also read aloud). The idiomatic expressions used were verb + particle constructions, such as look up or throw away (the particle portion is bolded). Evidence for the Global Elaboration Model did not emerge since no developmental trend for the literal and then figurative interpretations of the items was found. Following the Global Elaboration Model, younger participants (6-year-olds) should have applied a literal strategy (interpreting idioms constituent by constituent) in idiom interpretation and the older participants (11-year-olds) should have exploited the context for more figurative comprehension.

Crutchley’s (2007) interpretation of the findings was that children were unprepared “… to tolerate violations of syntactic structure in the pursuit of an interpretation that prioritizes the semantics of individual words; rather, they seem to assume that the verb has a non-literal interpretation that is unavailable to them, and choose a distracter that seems plausible in the context” (p. 218). Instead, Crutchley (2007) offered a ‘needs-only analysis’ (p. 218) hypothesis; that is, children break down
language chunks into their constituent parts only as needed. However, there are at least seven potential criticisms of this hypothesis.

First, all of the verb + particle constructions may have been at least somewhat familiar to both the younger and older participants. If participants were familiar with these constructions they may be lexicalized and stored in the mental lexicon in a way similar to the lexicalization and storage of familiar opaque idioms (e.g., kick the bucket). To ascertain whether this process occurred, novel verb + particle constructions would need to be considered.

Second, the need-only hypothesis is not at complete odds with the Global Elaboration Model as Crutchley (2007) states. The Crutchley (2007) data demonstrated that children processed idiomatic language “holistically” (p. 219) when they were confronted with familiar, opaque idioms (Cain et al., 2005; Levorato et al., 2004).

Third, Crutchley (2007) did find that performance improved significantly across age groups, particularly in the written task where children lacked pictorial support. Fourth, as Crutchley points out, particle verbs are non-decomposable idioms and not syntactically frozen like some idioms, which are the type that generally require more mature figurative language competence to interpret. Perhaps particle verbs are easier to process and digest; thus, even the younger participants were able to avoid a literal interpretation route.

Fifth, all of the items in the study were presented within a supportive, short-story context. It may have been the case that children were biased toward producing more figurative responses because of the presence of contextual cues. It would be interesting to run the same experiment with the items placed both in- and out-of-context in order to
assess whether semantic analysis would differ between the two conditions. A sixth criticism is that there were only seven items in each condition (i.e., seven picture tasks and seven written tasks), which may have led to unreliable results. It may be worthwhile to include more items in a future study.

Finally, the participants’ reading comprehension abilities were not taken into consideration in the Crutchley (2007) design. The Global Elaboration Model posits that “…literal interpretation is preferred when text processing abilities are weak” (Levorato, Roch, & Nesi, 2007, p. 491). Thus, children with poor text comprehension abilities would probably rely on literal interpretation, rather than figurative interpretation, of unknown idioms.

_Development of Oral Idiom Comprehension:_

_Monolingual and Cross-Linguistic Research_

*Typically Developing Children and Children with Linguistic/Cognitive Impairments*

Idiom comprehension has been researched extensively with monolingual English, Italian and French speakers, primarily children. A developmental trajectory of idiom comprehension has been identified in these typically developing monolinguals.

_Typically developing: Gradual emergence._ There appears to be a developmental trend, or gradual emergence, of idiom comprehension in monolinguals (Levorato & Cacciari, 1995). However, the depth and breadth of idiom comprehension continues throughout adolescence and across the lifespan (Nippold, Uhden, & Schwartz, 1997). Levorato and Cacciari (1995) found that Italian-speaking, monolingual children in grade two (\(M = 7; 10\) years) were more literally oriented than children in grade four (\(M = 9; 11\) years), who were more idiomatically oriented. Young children typically interpreted
idioms in a literal manner with a developmental trend towards more figurative comprehension.

Levorato and Cacciari (1995) accounted for the shift from more literal to more figurative interpretation as due to children’s initial processing of constituents in a bit by bit fashion, then developing the ability to infer figurative meaning holistically from written or spoken context. Thus, children appeared to access the literal meanings of the local constituents of idioms without integrating these meanings to create a holistic figurative meaning. Therefore, with further cognitive and linguistic development, local coherence eventually allowed for global representation of the text meaning in permitting children to exploit the linguistic context for more accurate and appropriate idiom comprehension.

Similarly, Abkarian et al. (1992) found that, in a picture choice task of oral idiom comprehension, English-speaking monolingual 6-year-olds provided more figurative rationales for their choices than did their younger counterparts (3;6-6;0 years-old). Moreover, idioms were most rapidly acquired between the ages of 7-to 11-years (Johnson et al., 2004). Interestingly, this is approximately the same age when a shift occurs in both speaking and writing from more oral (everyday) language use to more literate language use in English-speaking monolinguals (Scott, 2002).

Using mental imagery as a strategy to assess oral idiom comprehension (e.g., similar to a think-aloud process of on-line, verbalized problem-solving), Nippold and Duthie (2003) found that mental imagery for idioms followed a similar developmental trend as comprehension. They presented 40 preadolescents (mean age, 12; 3) with highly familiar idioms. Half of the idioms (10 idioms) were opaque and half (the remaining 10)
were transparent. After giving examples of how to verbalize mental imagery of idioms, the participants were asked to describe their mental images in writing when presented with these idioms. Mental images were coded as irrelevant, literal, or figurative.

The responses of the 40 preadolescents were then compared with the responses of 40 adults (Mean Age = 27). The preadolescents’ mental images tended to be less sophisticated, more literal, and reflective of only partial understanding. In contrast, adults’ mental images tended to be more figurative. Nippold and Duthie (2003) concluded from these two studies that the nature of mental images may serve as a *barometer* of idiom comprehension depth. Moreover, this developmental trend of increasingly sophisticated mental imagery mirrored the trend of more complexity in idiom comprehension development, from more literal interpretations to more figurative interpretations (Abkarian et al., 1992; Levorato & Cacciari, 1995).

More recently, Caillies and Le Sourn Bissaoui (2006) found a developmental effect, in particular a grade effect, in idiom comprehension in French-speaking monolingual children. Findings indicated that decomposable idiomatic expressions, those akin to transparent idioms, presented in context were understood earlier than nondecomposable idioms or those more similar to opaque idioms. Specifically, monolingual French-speaking children did not understand decomposable idioms until they were in *third kindergarten* (ages 5;3 to 6;2). In contrast, nondecomposable idioms were not understood until children were in the second grade (ages 7;6 to 9;2). Moreover, Caillies and Le Sourn Bissaoui (2006) concluded that perhaps the figurative meaning of decomposable idioms might be interpreted from inferences drawn about the constituent
word meanings; however, these inferences were less helpful in interpreting the figurative meaning of unfamiliar nondecomposable idioms.

A final study (Chan & Marinellie, 2008) further supports this developmental trend in idiom comprehension. Native English-speaking preadolescents (grades 4 and 5; \( n = 20 \)), young adolescents (grade 8; \( n = 20 \)), older adolescents (grades 11 and 12; \( n = 20 \)), and adults (college students; \( n = 20 \)) defined 10 highly familiar idioms presented in isolation. There were significant age differences between the adult group and the two younger groups, and between older adolescents and the two younger groups. Performance on idiom familiarity and idiom definitions improved with age.

Two points emerge from these developmental studies. First, non-decomposable idioms may be learned and lexicalized, depending on the frequency of exposure. Second, figurative competence appears to depend on academic experience and, potentially, the degree of semantic and pragmatic abilities that individual children have developed (Caillies & Le Sourn Bissaoui, 2006).

*Idiom comprehension in children with linguistic/cognitive impairments.* Children with linguistic and/or cognitive impairments have distinctive profiles. In general, children with language impairments may have significant difficulty understanding idioms (Spector, 1992). Children with cognitive deficits also have difficulty interpreting oral idioms (Ezell & Goldstein, 1991). Overall, children with linguistic and/or cognitive impairments typically interpret oral idioms literally, much like younger children (Norbury, 2004).

For example, Ezell and Goldstein (1991) compared 22, 9-year-old children, who were classified with mild mental retardation (MR), with 22 typically developing 9-year-
olds, and 22 younger children who were matched to the cognitively impaired group according to receptive vocabulary scores. All participants were English-speaking monolinguals. Even though children with cognitive impairment preformed significantly better than the younger children in the study, they consistently tended to give literal responses.

Norbury (2004) simultaneously investigated children with linguistic impairment, children with autism spectrum disorder (ASD), and children with both linguistic impairment and ASD. A total of 93 children between 8 and 15-years-old were classified into four groups based on three measures: a) three standardized language assessments used to examine expressive and receptive language ability, b) an autistic screening parent questionnaire, and c) a communication checklist to determine the existence of pragmatic impairment. The four resulting groups consisted of autistic spectrum with language impairment, autistic spectrum without language impairment, language impairment only, and pragmatic impairment only. Norbury’s (2004) findings indicated that all participants benefited from the use of context to comprehend unfamiliar oral idioms. Of importance, one of the most significant predictors of idiom understanding was language ability; that is, those children with linguistic impairment (either with or without ASD) performed more poorly than those children without language impairment. One limitation of this study involves the response format of the idiom test. Participants were required to define and explain idioms, which was difficult for all participants, but perhaps created an even greater disadvantage for those children diagnosed with ‘expressive language impairment’.

In another study, Qualls, Lantz, Pietrzyk, Blood, and Hammer (2004) found that adolescents with a documented diagnosis of language-based learning disabilities (LBLD)
in grade 8 ($n = 27$) had more difficulty comprehending written idioms than their age-matched and reading-ability-matched peers in grade 8 ($n = 21$), who were also reading below grade level. Reading and language arts scores on the California Achievement Test (CAT) were obtained for each participant. The CAT assessed vocabulary (e.g., synonyms), reading comprehension (e.g., inference-making), language mechanics (e.g., editing skills), and language expression (e.g., coherent writing). Language ability (regardless of LBLD status) predicted more of the variance than did reading ability alone. In addition, a strong relationship emerged between idiom comprehension and reading ability as assessed by the Idiom Comprehension Test (ICT; Qualls & Harris, 1999).

All studies investigating children with language-based disorders have collectively concluded that language impairment is one of the leading causes in idiom comprehension failure, as well as failure in other academically-related tasks, specifically tasks involving inference generation. Several studies have also demonstrated that children and adolescents with language-based learning disabilities are typically unable to use contextual cues effectively to interpret idioms (Qualls et al., 2004). Moreover, all of these findings suggest that idioms should be taught in an explicit manner to children with linguistic and cognitive deficits (Norbury, 2004).

*Idiom Comprehension in Second-Language Learners*

There has been minimal research on the oral and written idiom comprehension of bilingual children. The majority of research has been conducted with bilingual adults (Abel, 2003; Cooper, 1999; Laufer, 2000; Liontas, 2002). These studies have tended to search for insights to enhance idiom instruction.
Adult studies. Cooper (1999) suggested that second-language learners use multiple strategies depending on the transparency/opaqueness, decompositionality, and/or familiarity of idioms. Cooper employed think-alouds to understand how adult second-language learners processed idioms since this methodology allowed for the evaluation of the usually silent processes involved in reading comprehension. To give the idiomatic expressions context, Cooper included more literal idioms (e.g., to see eye to eye) and more oral idioms or slang (e.g., what’s cooking?). All were embedded in one to two sentences. The 18 participants, ages 17- to 44-years-old, who were all learning English as a second language, included 8 Spanish-speakers, 3 Japanese-speakers, 5 Korean-speakers, 1 Russian-speaker, and 1 Portuguese-speaker. As a group, there was an absence of correlation between the literal and figurative meanings of opaque idioms, which seemed to be an obstacle in idiom comprehension. Idioms that were easier to interpret were reported to be more familiar.

Cooper identified three strategies that the participants used at least 71% of the time: a) guessing from context, b) discussing and analyzing the idiom, and c) referring to the literal meaning of an idiom. Approximately 29% of the time, the participants used additional strategies, including: a) requesting information, b) repeating or paraphrasing the idiom, c) using background knowledge, and d) referring to a similar idiom from their native language. A total of 57% of idioms were interpreted correctly. Major limitations of the study were that only qualitative and descriptive statistics were employed, variables such as semantic transparency, familiarity, and context were not controlled, and the sample size was small and linguistically variable in their first languages.
In another adult study, Liontas (2002) created the Idiom Diffusion Model (IDM) to explain the idiom comprehension of 53 university students whose first language was English and who were second-language learners of Spanish, French, or German. The IDM contains a prediction phase similar to predictive inferencing, followed by a confirmation phase in the idiom comprehension of second-language learners. Participants read second-language idioms in and out of context and then 1) wrote the idioms’ meanings, 2) identified the reading strategies used, the thought processes utilized, and the schema/image created while interpreting each idiom, and 3) identified their affective states when interpreting each idiom. Transfer of idiomatic knowledge was significantly affected by context, translation equivalency, degree of idiomatic opacity, lexical knowledge, syntactic arrangement, and literal meanings. The results supported the IDM; however, this model is not appropriate to investigate the idiom comprehension of children since a high level of metalinguistic awareness is necessary to report one’s own predictive inferencing and inference confirmation strategies.

Next, Abel (2003) pointed out that earlier monolingual hypotheses of idiom comprehension (e.g., Swinney & Cutler, 1979) centered on the lexical level of activation rather than both the lexical and conceptual levels. Bilinguals appear to share a conceptual level of representation between their native and nonnative lexicons (e.g., Hernandez, Li, & MacWhinney, 2005); therefore, it may be that both languages are accessed at the conceptual level when the individual is faced with an unknown idiomatic expression. Abel (2003) introduced the Dual Idiom Representation (DIR) model to address how 169 graduate and undergraduate native speakers of German appeared to store English nondecompositional idioms as idiom entries while decompositional idioms were
represented by their constituents. Furthermore, results demonstrated that an idiom’s decompositional status determined its representational status (i.e., whether or not it was represented as a lexical entry), and an idiom’s frequency influenced the development of a lexical entry for a non-decompositional idiom; that is, the more frequent an idiom appeared in the language, the more likely a lexical entry for that idiom would be created. An assumption of the DIR is that second-language learners do not develop as many idiom entries as native speakers due to a lower frequency of encounters with those idioms in the second language. Thus, when an idiom in the second language does not correspond to an idiom in the first language, second-language learners may rely more on constituent lexical entries. The overall premise of the DIR is similar to the Global Elaboration Model in that opaque idioms are typically lexicalized, and unknown transparent idioms are semantically analyzed. The Global Elaboration Model was chosen as the theoretical framework for the present study instead of the DIR since a) the DIR has only been utilized in one study on educated adults, and b) the research design of the current study does not assess idioms’ representational status.

*Limitations of second language learner studies.* Overall, a general limitation of these second language learner studies is the lack of inferential statistical evidence. For instance, Cooper (1999), Liontas (2002), and Abel (2003) all utilized only descriptive statistics. Furthermore, factors known to impact on either oral or written idiom comprehension, such as semantic transparency, familiarity, and context, were not systematically controlled.

A second limitation of these previous studies is their sample characteristics. All the samples consisted of adults with a considerable amount of education. There have not
been any studies conducted with bilingual children or adolescents, typically developing or with language/cognitive impairment. Furthermore, none of the bilingual studies have investigated the relationship between idiom comprehension and text comprehension, a relationship that monolingual and cross-linguistic studies (e.g., Cain et al., 2005; Levorato et al., 2004) have suggested is strong.

*Reading Comprehension, Idiom Comprehension,*

*and the Global Elaboration Model*

*Idioms and Text Comprehension*

*Initial studies.* The Global Elaboration Model was used as the underlying rationale for one of the few idiom comprehension studies involving reading comprehension. Levorato et al. (2004) investigated whether reading comprehension skills in monolingual Italian children predicted their idiom comprehension skills. Based on the model’s construct, the study’s rationale was that, instead of semantically deconstructing an idiom into its individual parts, idiom comprehension required children to integrate figurative meaning with contextual information (Levorato et al., 2004).

The model’s basic premise was that the critical factor in acquiring and comprehending idioms concerned the ability to relate an idiom’s meaning to its surrounding social and linguistic contexts (Cain et al., 2005). The hypothesis tested was that reading comprehension skills would predict idiom comprehension skills. Results provided support for the hypothesis. Children with better reading comprehension abilities were more able to interpret idiomatic meanings that required inferencing in order to construct a global semantic representation.
Longitudinal investigation. A more recent study of idiom and reading comprehension in Italian-speaking children examined the predictiveness of reading comprehension in a longitudinal design. Levorato et al. (2007) studied 6-year-old first graders with various levels of reading comprehension abilities (23 “good comprehenders” and 29 “poor comprehenders”) over eight months. To provide more evidence for their Global Elaboration Model, the investigators analyzed children’s comprehension of idiomatic and literal sentences at two distinct times: in first grade and again in second grade (eight months later). The authors argued that this study made two new contributions to the literature. It was the first longitudinal study to identify the developmental relationship between text and idiom comprehension, and to consider the role of literal sentence comprehension as a potential mediator between text and idiom comprehension. Text and idiom comprehension relies more on inferential capacity and comprehension monitoring (both higher-level processing skills necessary to attain global coherence) than did literal sentence comprehension (which, alone, is insufficient for accurate text and idiom comprehension). Thus, the Global Elaboration Model would predict that a) only the children who improved in text comprehension would improve in idiom comprehension, and b) literal sentence comprehension should play a lesser role in idiom comprehension than did text comprehension. The sentence comprehension task required participants to choose one of four pictures that depicted each sentence. It was not noted whether the sentences were read by the participants or read aloud by the investigators.

Results indicated that, during the first phase of the study, skilled comprehenders preferred figurative interpretations of idiomatic expressions, while less-skilled
comprehenders preferred literal interpretations. A multiple regression analysis demonstrated that text comprehension abilities accounted for approximately 32% of the variance in the idiom comprehension measure, whereas sentence comprehension did not explain any further variance. Thus, the authors concluded that the contribution of text comprehension ability explained a significant amount about idiom comprehension ability contrasted with sentence comprehension ability.

In the second phase of the study eight months later, about half of the less-skilled comprehenders had improved their text comprehension by 30 percent. There was no attrition of the less-skilled comprehenders reported from phase one to phase two. Analyses of figurative versus literal responses on the idiom comprehension task demonstrated that less-skilled comprehenders, although they had improved from the first phase, still chose more literal answers than the skilled comprehenders. The authors posited that this pattern yielded evidence for shallower text processing, which is inadequate either for accurate global text or idiom comprehension. A multiple regression analysis showed that improvement in sentence comprehension played a role in children’s progress in idiom comprehension for the less-skilled comprehenders; however, the improvement in sentence comprehension was related to the improvement in text comprehension. Text comprehension was the most significant factor in improvement of idiom comprehension.

There are a number of unresolved issues with the longitudinal outcomes:

1) Unfortunately, the results of the sentence comprehension test in the second phase were unstated; therefore, it is difficult to determine how the less skilled versus the
more skilled comprehenders improved on this measure in comparison to the other measures.

2) Oral language ability was not assessed; thus, any conclusions regarding linguistic processing ability as shallow or deep are suspect.

3) Children’s decoding abilities, a skill that would supersede independent text comprehension, were not tested.

4) In the second phase the formerly less-skilled comprehenders were divided into skilled and less-skilled groups again, depending on whether they improved their reading comprehension by 30%. No empirical rationale was given as to why 30% was used as a criterion; therefore, the selection of this percentage appears arbitrary.

5) Lastly, the number of items on the idiom measure was unreported. Hence, it is difficult to interpret fully the distribution of idiomatic, literal, and filler answers. Moreover, it was unclear how familiar participants were with the idioms utilized, and familiarity could be a confounding variable. A study from Great Britain with monolingual English-speaking children addressed this last limitation in particular (Cain et al., 2005).

**Cross-sectional research on the Global Elaboration Model.** Cain et al. (2005) investigated the relationship between idiom comprehension and reading comprehension based on the Global Elaboration Model initially developed by Levorato and Cacciari (1995). The idiom comprehension of 28 9- and 10-year-old children with good \((n =14)\) and poor \((n =14)\) reading comprehension skills was compared. Children were matched on word reading ability and vocabulary knowledge scores from standardized measures. Transparent and opaque idioms were utilized. An innovative addition to this line of
research was the inclusion of both familiar and unfamiliar idioms that were translated European idioms. As mentioned previously, familiarity and exposure to idioms can confound idiom knowledge. To eliminate prior British cultural experience as a confounding variable, Cain et al. (2005) used the unfamiliar European idioms.

Results demonstrated that children understood familiar idioms better than the unfamiliar ones, even when presented in context, a finding that supported the language experience hypothesis. Cain et al. (2005) also found evidence for the practicality of the Global Elaboration Model because the poor comprehenders engaged in analyzing idioms constituent by constituent; while the more proficient readers relied on both local and global coherence, along with inferencing, to obtain meaning. In other words, good comprehenders were able to go beyond individual semantic analysis at the word level to accomplish two ends: they surpassed literal and inappropriate semantic meanings and drew inferences based on available context. The outcome was the integration of the appropriate semantic meanings and derivation of appropriate figurative meanings. Constituent by constituent analysis was not detrimental when the children were presented with transparent or decompositional idioms; however, piece by piece analysis led to literal and/or inappropriate analyses of opaque or non-decompositional idioms. The opaque idioms required use of textual context to draw inferences.

Cain et al. (2005) concluded, therefore, that idiom comprehension appeared related to levels of reading comprehension. Although this study provided evidence in favor of the relationship between reading comprehension and idiom comprehension while controlling for prior idiom knowledge, it did not assess other potential processing abilities that may be key in both reading comprehension and idiom comprehension. For
instance, Levorato et al. (2004) suggested that future studies of idiom comprehension should identify the processing abilities that reading comprehension and idiom comprehension share.

**Shared Processes in Reading Comprehension and Idiom Comprehension**

Idiom and reading comprehension require similar conceptual understandings. These conceptual understandings include a well-developed theory of mind (the ability to attune interpretation to the speaker’s/writer’s intended meaning), the application of background knowledge, and the knowledge that inferences must be generated. The Global Elaboration Model is based on a well recognized text comprehension model, Kintsch’s (1998) Construction-Integration (C-I) Model. The impetus for the C-I Model was the Discourse Model of Reading Comprehension (van Dijk & Kintsch, 1983). The C-I Model (Kintsch, 1998) is built on the importance of constructing a situational model (or a mental representation of a text) to create meaning. Theoretically, the model can be applied to the comprehension of both oral and written discourse.

*The C-I model.* The C-I Model posits that a text is made up of many propositions, or units of linguistic meaning. To comprehend the gist of a text, the reader must succeed in creating coherence, which is assembled through inference generation (e.g., combining known knowledge with incoming knowledge) and inference retrieval (e.g., accessing background knowledge via long term memory). Inferences also require theory of mind or perspective taking to understand the implicit meanings of others (both real and hypothetical) and the points of view of characters and authors.

First, local coherence between propositions or constituents in the same sentence must be achieved. Then, global coherence from sentence to sentence across the text must
be attained. Local and global coherence refer to the construction and integration phases, respectively (Kintsch, 1998). Integration of meaning is necessary for text comprehension (see Figure 2).

**Figure 2.** Construction-integration phases of text comprehension based on Kintsch (1998).

**Comprehension monitoring and error detection.** Making accurate meaning of text also requires an awareness of how well the text is understood, or the ability to monitor comprehension (National Reading Panel, NRP, 2000). By monitoring comprehension,
readers discern if they have understood the text or if they need to reprocess chunks of misunderstood text (Morrison, 2004). It is likely that the individual reader must be able to monitor his/her comprehension of text in order to employ effective comprehension strategies (Morrison, 2004). Comprehension monitoring is a type of cognitive monitoring and “…refers to students’ awareness of the degree to which they understand what they are reading” (Morrison, 2004, p. 78). Morrison (2004) investigated the relationship between comprehension monitoring in readers’ first (L1) and second languages (L2) at the university level in 52 advanced learners of French as the L2. In conducting the study, Morrison utilized an error detection task, a technique used to manipulate a text’s comprehensibility by purposefully embedding text errors in order to measure comprehension monitoring.

Morrison (2004) found positive correlations between a) L1 reading proficiency and overall L1 error detection ($r = 0.60, p<0.01$), b) L1 reading proficiency and L1 macro-level error detection ($r=0.54, p<0.01$), and c) L1 reading proficiency and L1 micro-level error detection ($r=0.51, p<0.01$). Similarly, Morrison found significant, positive correlations between L2 reading proficiency and error detection ability, as well as significant crosslinguistic correlations. Moreover, these findings suggested that the Morrison error detection task may be a reliable measure of comprehension monitoring; and that comprehension monitoring is correlated with reading comprehension ability.

In the past, descriptive measures have been utilized to assess comprehension monitoring. For instance, one common past methodology had participants estimate how well they performed on a post-reading comprehension measure. These estimates of performance, or confidence ratings, were then compared to the participants’ actual scores.
Unlike descriptive tasks, the Morrison error detection paradigm assesses two known comprehension monitoring processes: identifying an error and repairing an error, at an experimental level. Furthermore, in accord with Kintsch’s (1998) C-I Text Comprehension Model, the error detection paradigm allows for error detection at the sentence or micro-level (i.e., the meaning-construction phase) as well as at the discourse or macro-level (i.e., the information-integration phase).

*Processing abilities underlying figurative comprehension.* A set of specific processing abilities is required in figurative text comprehension, such as idiom comprehension and/or metaphor and proverb comprehension. According to Levorato and Cacciari (1995), the abilities involved include: a) understanding each word’s multiple meanings, b) going beyond literal interpretations, c) using context to create a coherent figurative expression, and d) appreciating that what is said may not always coincide with what is meant. Furthermore, Levorato and Cacciari (1995) refer to the attainment of these processing abilities as achieving figurative competence.

Levorato et al. (2004) conjectured that difficulty interpreting figurative meanings may be due to three factors: a) not being able to suppress the literal meanings of the idiom’s constituent words; b) having less ability to exploit contextual information to create a situation model; and c) the inability to make necessary inferences in order to choose the appropriate (figurative) meaning. The development of figurative competence is seen as emergent over time and nonlinear (Levorato & Cacciari, 1995).

Furthermore, the same knowledge and processes (e.g., cognitive, linguistic, pragmatic) used to comprehend linguistic information in general are also used to comprehend idiomatic expressions. In sum, “The cognitive skills necessary to understand
figurative language are grounded in the capacity a child must possess to process a text” (Levorato et al., 2004, p. 311). Levorato et al. (2004) outlined the four most relevant principles of reading comprehension for idiom comprehension:

1) Application of inference generation and retrieval strategies to create local coherence at the word level and global coherence at the sentence level while considering contextual support.

2) Application of inhibitory strategies to suppress, or at least suspend, irrelevant constituent meanings in favor of relevant, figurative meanings.

3) Application of comprehension monitoring strategies to ensure accurate comprehension performance.

4) Application of establishing contextually specific and appropriate word meanings from various possible meanings.

These four principles are the crux of the model underlying this study and are expanded on next.

*The Model and Research Questions*

The link between reading comprehension and idiom comprehension, as described by Cain et al. (2005) and Levorato et al. (2004), provided not only the motivation for the present study, but also its conceptual framework. In sum, the evidence that reading comprehension may predict idiom comprehension lends support for incorporating the Kintsch (1998) C-I Model with the Global Elaboration Model. The study’s purpose was to explore further the relationship between idiom and reading comprehension in adolescents who were Spanish-English bilinguals. In implementing this combined model, the innovative Cain et al. (2005) methodology was employed in an expanded manner
with both monolingual (English-speaking) and bilingual (Spanish-English-speaking) adolescents as participants. The literature is notably devoid of investigations on idiom comprehension as it relates to reading comprehension in Spanish-speaking bilingual adolescents in the United States.

**Purpose**

This study’s purpose was to investigate idiom comprehension in bilingual adolescents and their monolingual peers through the systematic evaluation of each of Levorato et al.’s (2004) four principles (see Figure 3). At the same time, the intent was to control systematically for the three variables of semantic transparency, familiarity, and context. This study’s design went beyond prior research on the Global Elaboration Model (e.g., Levorato et al., 2004; Levorato et al., 2007) due to a) the focus on a bilingual sample, b) the investigation of cognitive-linguistic processes shared by text and idiom comprehension, c) the assessment of decoding ability, d) the utilization of a statistically significant different skilled- and less-skilled comprehenders groups, and e) the use of unfamiliar idioms similar to Cain et al. (2005). Unlike Cain et al. (2005), this study included a larger, diverse sample size ($N=62$) and a varied set of measurements.
Principles

Each of the four principles was operationalized so that it was assessed independently.

Principle 1. Inference generation and retrieval is essential to create local coherence at the word level and global coherence at the sentence level combined with the
use of contextual support. This principle was assessed by measuring the participants’ ability to formulate inferences from the single word level to the sentence level. This ability was tested through the administration of the reading comprehension passage subtest of the Woodcock Johnson III-Achievement (Woodcock, Mather, & McGrew, 2001; WJ III-ACH).

**Principle 2.** Inhibitory strategies must be applied to suppress, or at least suspend, irrelevant constituent meanings in favor of relevant, figurative meanings. This principle was assessed by measuring the participants’ ability to ignore inappropriate, literal and contextually relevant, but inaccurate, figurative meanings in favor of contextually appropriate and accurate figurative meanings. To meet this aim, a constructed multiple choice idiom measure systematically tested: a) familiar and unfamiliar idioms, with the unfamiliar idioms similar in form to those used in Cain et al. (2005), and b) transparent and opaque idioms, c) in and out of context.

**Principle 3.** Comprehension monitoring strategies must be employed to maximize accurate comprehension performance. This third principle was assessed by measuring the participants’ ability to monitor their comprehension at the micro-level (the sentence level) and the macro-level (the paragraph level) using an error detection task derived from Morrison (2004).

**Principle 4.** The ability to integrate contextually specific and appropriate word meanings from various possible definitions was assessed by measuring one part of lexical depth. Word knowledge can be described in at least two dimensions: breadth and depth. Lexical breadth refers to the shallow aspect of vocabulary size, or the number of words for which someone has at least some superficial level of knowledge (Qian, 1999, 2002).
Depth of lexical knowledge refers to how well a word and its semantic relationships are known (Qian, 1999), such as knowledge of a word’s multiple meanings which are interconnected by a semantic network. Interconnected meanings, also referred to as polysemy (Nagy & Scott, 2000), comprise an important aspect of lexical depth. A synonym task from the Woodcock Johnson III-ACH (Woodcock et al., 2001) Reading Vocabulary Subtest was selected for this purpose.

The systematic measurement of the four principles in the model is further elaborated on in the Method chapter.

Research Questions

There were three questions related to the study’s theoretical model:

1) To what extent does each of three of the linguistic variables predict the criterion, idiom comprehension accuracy? These variables were: a) reading comprehension, b) error detection, and c) knowledge of synonyms. It was hypothesized that performance on the three measures would strongly predict performance on the idiom comprehension measure for both the bilingual and monolingual groups.

2) The second research question related to whether there were differences in idiomatic performance outcomes between the bilingual and monolingual language groups. The specific question concerned how the performance outcomes of the bilingual adolescents would differ from the performance outcomes of the control group (monolingual, English-speaking adolescents) given different levels of idiomatic familiarity, semantic transparency, and context. It was predicted that there would be an interaction among familiarity, semantic transparency, context, and language group. A total of four sub-hypotheses were associated with this question.
2a) Both monolinguals and bilinguals would perform less adequately on unfamiliar, opaque idioms.

2b) Monolinguals would perform better on familiar idioms based on the language experience hypothesis than would the bilinguals.

2c) All participants should perform better when given contextual support than without it; however, context would not benefit less skilled comprehenders as much as skilled comprehenders.

2d) Those participants with less adequate reading comprehension scores would choose more literal responses regardless of language group membership.

3) The third and final research question focused on the bilingual adolescents only. It was hypothesized that meaningful differences would exist within the bilingual group depending on age of acquisition (AOA) of English or time spent in the United States, and, subsequently, amount of Spanish spoken on a daily basis. The question asked whether those bilingual students who were less linguistically assimilated (measured by amount of Spanish spoken, and thus less English, daily) would perform in a significantly different manner from bilingual students who were more linguistically assimilated (spoke less Spanish, and thus more English, daily). This within-group question required both quantitative and qualitative analyses of performance differences between the simultaneous- and sequential-language-learners.
Chapter Two
Pilot Study

The purpose of the pilot study was twofold: a) to assess the validity of the constructed idiom measure and b) to complete a preliminary analysis of performance differences on the idiom measure for two groups of undergraduate students: a bilingual group and a monolingual group. The pilot study consisted of two parts. In the first part, monolingual (English-only) and bilingual undergraduate university students completed the pilot idiom measure, and their responses were statistically and qualitatively analyzed. During the second portion, monolingual (English-only) adolescents completed a familiarity rating form, and their results were also quantitatively and qualitatively analyzed.

The development of the idiom measure and the methodology employed in the undergraduate study is described first. Next, the development of the familiarity rating form and the methodology employed in the adolescent study is explained. Following each of these descriptions, the analyses of the pilot data are presented along with a discussion of their implications. Finally, the creation of the finalized idiom measure is addressed.

Method: Part 1

Participants

For the quasi-experimental portion of the pilot study, students at the University of South Florida with an undergraduate major in Communication Sciences and Disorders
(CSD) were recruited through posted signs (see Appendix A) and emails sent by two of three participating professors. The principal investigator also attended a third professor’s class and announced the need for participants. Students were given extra credit in return for their participation.

Participants had to meet three criteria: a) be between the ages of 18- to 35-years-old; b) be an undergraduate student; and c) either be a monolingual (English-only) speaker or a self-reported bilingual speaker (speaker of English and at least one other language). These criteria were established in order to conduct statistical comparisons between monolingual and bilingual participants with similar educational backgrounds. Furthermore, the age restrictions were included to avoid any significant generational differences in idiom knowledge between the undergraduates and the adolescents in the second pilot study.

The sample consisted of 18 monolingual (English-speaking) and 18 bilingual students majoring in CSD. For the total group, there were 34 females and 2 males (both monolinguals), which was representative of the undergraduate population in the CSD Department at the University of South Florida, Tampa. All participants were between 18 years and 11 months and 35 years and 2 months old (see Table 2.1). The mean age of the monolinguals was 22; 4 ($SD = 2.8$ years; range, 18;11 – 31;5), while the mean age of the bilingual students was 24; 5 ($SD = 5.06$ years; 19; 11 - 35;2).

The age span of the bilingual group was more variable; however, a $t$-test did not find a statistically significant difference in age between the two groups (see Appendix B for all non-significant $t$-test results). Of the 18 bilingual students, 13 spoke English and Spanish and 5 spoke English along with Hindi, Arabic, Malayem, Creole and French, or
Urdu (see Table 2.1). All of the bilingual students had been in the United States for at least five years.

Table 2.1
USF Undergraduate Participant Information

<table>
<thead>
<tr>
<th>Monolinguals (Ages: $M=22.36$, $SD=2.8$; Range= 18.11-31.5)</th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
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<td>Gender</td>
<td>Language</td>
</tr>
<tr>
<td>----------------------</td>
<td>---------</td>
<td>----------</td>
</tr>
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<td>20.8</td>
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</tr>
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</tr>
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</tr>
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</tr>
<tr>
<td>22.3</td>
<td>Female</td>
<td>English</td>
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<td>31.5</td>
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<table>
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<th></th>
<th>Language (Other than English)</th>
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<tbody>
<tr>
<td>Age (Years, Months)</td>
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</tr>
<tr>
<td>----------------------</td>
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<td>21.3</td>
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<td>21.7</td>
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<td>22.3</td>
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</tr>
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<td>27.6</td>
<td>Female</td>
<td>Spanish</td>
</tr>
</tbody>
</table>
Materials: Development of the Pilot Idiom Measure

The pilot idiom measure (see Appendix C), meant to be read silently and independently by each participant, tested the familiarity, semantic transparency, and contextual strategies used for comprehending idioms in a systematic manner through 96 multiple choice items. Possible selections were multiple choices in order to minimize oral language production, with 3 choices per idiom. Of the 3 answers, one was a literal but an inaccurate translation of the idiom, one was a figurative and correct translation of the idiom, and the third was figuratively related to the idiom but incorrect.

Familiarity. The 48 idioms were categorized into two levels of familiarity: 24 familiar and 24 unfamiliar. The familiar idioms had a higher frequency in American English, such as break the ice and, presumably, were more familiar than unfamiliar ones. These idioms were adapted from idiom measures utilized with monolingual, English-speaking children (e.g., Abrahamsen & Burke-Williams, 2004; Nippold, 1991; Nippold & Duthie, 2003; Norbury, 2004). The 24 unfamiliar idioms were translated European idioms, primarily adapted from Cain et al. (2005), such as to have salt in your pumpkin (meaning to be intelligent). Most likely, these idioms had a lower frequency of occurrence in American English.

Semantic transparency. The familiar and unfamiliar idiom groups were further subdivided into semantically transparent and opaque categories. There were 12
transparent familiar idioms, 12 opaque familiar idioms, 12 transparent unfamiliar idioms, and 12 opaque unfamiliar idioms. Those categorized as transparent had a more direct relationship between their literal and figurative meanings, such as *to call it quits*. In contrast, with opaque idioms, a less direct relationship existed between their literal and figurative meanings. For example, *to pull someone’s leg* is a more opaque idiomatic expression.

*Context.* All 48 idioms were presented first out of context (in isolation) and then in short story contexts. Previous studies showed that comprehension of idiomatic expressions was facilitated by contextual support (Cacciari & Levorato, 1988; Nippold & Martin, 1989). For this study’s purposes, unfamiliar idioms were those in which participants had to rely on contextual cues to interpret them. Therefore, unfamiliar idioms were testing the extent to which participants were able to take advantage of linguistic and social cues embedded in the short stories since reliance on familiarity alone in the unfamiliar idiom condition would lead to an erroneous interpretation.

*Procedure*

After completing consent forms (see Appendix D), the undergraduate students completed the idiom measure. The measure was completed independently in three separate groups in the Language Laboratory of the CSD Department within two weeks of each other during the spring semester of 2006. Each student took approximately 15 to 20 minutes to complete the instrument. The following directions were presented to all participants orally:

*I am creating an idiom test for high school students and need to make certain that there are no unforeseen glitches. You will see each idiom, like ‘spill the beans,’*
appear twice on the test. The first time the idiom will appear alone and the second
time the idiom will appear within context. It is very important that you work
forward, and not go back and change your answers after reading the idiom a
second time in context. Please read each idiom carefully and then choose the best
definition of the idiom. You may not know some of the idioms, and may have to
guess their meanings. The idioms may become progressively less familiar
throughout the test. This task is completely voluntary, and if you wish to quit
taking the test at any time, you are free to do so without any penalties or adverse
effects on your grades. Please hand in the test when you are done and thank you
for participating.

In addition to these oral instructions, the students were urged to read the printed
instructions on the first page of the measure:

Idioms are figurative or non-literal language like ‘raining cats and dogs’ or
‘bought the farm’. I am creating an idiom test and need your help piloting this test
before giving it to bilingual and monolingual high school students in the future.
Their results will be compared to their reading and vocabulary scores to
investigate any meaningful relationships.

Please read each question carefully and then circle the best answer. There may be
idioms that you do not know and will guess their meanings. It is important to work
forward, and not to go back to change answers. If at any time you wish to stop
completing this form you may do so without any consequences whatsoever. This is
completely voluntary. If you have any questions feel free to ask me. I would like to
thank you for participating.
Upon completion of the task, each student received a card verifying participation along with a synopsis of the study and its purpose (see Appendix E). All but one of the 36 students completed the entire test. The data from the bilingual student whose results were incomplete were not included in any analysis. To make the bilingual and monolingual samples equivalent in number, the data from one monolingual participant were randomly chosen to be discarded as well. The final sample analyzed therefore consisted of 17 bilinguals and 17 monolinguals.

Results: Statistical Analyses

Total scores. The scores for each language group (bilingual or monolingual) were tallied for a total score, thereby collapsing all the conditions together. The maximum possible score for each participant was 96 (48 idioms, presented in and then out of context). For this analysis, responses were counted as either correct or incorrect, and a t-test was conducted to determine the mean differences between the two language groups. The bilingual group had a mean score of 83.24 ($SD = 3.68$) and the monolingual group had a mean of 85.71 ($SD = 2.76$). Table 2.2 displays the descriptive data (median, mode, and score ranges) for each language group. An independent t-test revealed an observed t value of -2.21 and $p = 0.034$, indicating a significant difference between the total mean scores of the two language groups. Furthermore, the estimated effect size of $d = 0.76$ was calculated. According to Cohen’s (1988) guidelines, this is a medium to large effect size, suggesting that the magnitude of the mean difference in scores was meaningful.

Table 2.2
Total Scores for Idiom Accuracy as a Function of Language Group

<table>
<thead>
<tr>
<th>Monolinguals</th>
</tr>
</thead>
<tbody>
<tr>
<td>85.71</td>
</tr>
</tbody>
</table>
Next, to determine whether an effect existed for each variable when crossed with other variables [language group (bilingual or monolingual) x familiarity (familiar and unfamiliar) x semantic transparency (transparent and opaque) x context (with and without)], a four-way, repeated measures, analysis of variance (ANOVA) was conducted. Language group (bilingual or monolingual) was a between subjects factor and familiarity, semantic transparency, and context were within subjects factors. Table 2.3 summarizes the descriptive data of the accuracy scores under each condition as a function of language group, and Table 2.4 summarizes the ANOVA results.

Table 2.3
Accuracy Scores for Idiom Conditions as a Function of Language Group

<table>
<thead>
<tr>
<th>Idiom Condition</th>
<th>Bilinguals</th>
<th>Monolinguals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Familiarity-Familiar</td>
<td>45.47</td>
<td>2.38</td>
</tr>
<tr>
<td>Familiarity-Unfamiliar</td>
<td>37.76</td>
<td>3.04</td>
</tr>
<tr>
<td>Transparency-Transparent</td>
<td>44.29</td>
<td>2.49</td>
</tr>
<tr>
<td>Transparency-Opaque</td>
<td>38.94</td>
<td>2.07</td>
</tr>
<tr>
<td>Context-In</td>
<td>46.59</td>
<td>1.29</td>
</tr>
<tr>
<td>Context-Out</td>
<td>36.65</td>
<td>3.01</td>
</tr>
</tbody>
</table>
Table 2.4
ANOVA Results for the Accuracy Scores on the Pilot Idiom Measure

<table>
<thead>
<tr>
<th>Variable and source</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Familiarity</td>
<td>(1, 32)</td>
<td>288.24</td>
<td>210.47</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>Familiarity x Group</td>
<td>(1, 32)</td>
<td>1.19</td>
<td>0.87</td>
<td>0.36</td>
</tr>
<tr>
<td>Transparency</td>
<td>(1, 32)</td>
<td>108.77</td>
<td>121.62</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>Transparency x Group</td>
<td>(1, 32)</td>
<td>0.37</td>
<td>.41</td>
<td>0.53</td>
</tr>
<tr>
<td>Context</td>
<td>(1, 32)</td>
<td>425.00</td>
<td>473.29</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>Context x Group</td>
<td>(1, 32)</td>
<td>0.02</td>
<td>0.02</td>
<td>0.90</td>
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<tr>
<td>Familiarity x Transparency</td>
<td>(1, 32)</td>
<td>74.13</td>
<td>77.63</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>Familiarity x Context</td>
<td>(1, 32)</td>
<td>252.37</td>
<td>442.15</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>Transparency x Context</td>
<td>(1, 32)</td>
<td>121.78</td>
<td>268.21</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>Familiarity x Transparency x Context</td>
<td>(1, 32)</td>
<td>72.06</td>
<td>114.29</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>Familiarity x Transparency x Group</td>
<td>(1, 32)</td>
<td>0.06</td>
<td>0.06</td>
<td>0.81</td>
</tr>
<tr>
<td>Familiarity x Context x Group</td>
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<td>2.12</td>
<td>3.71</td>
<td>0.06</td>
</tr>
<tr>
<td>Transparency x Context x Group</td>
<td>(1, 32)</td>
<td>0.94</td>
<td>2.07</td>
<td>0.16</td>
</tr>
<tr>
<td>Familiarity x Transparency x Context x Group</td>
<td>(1, 32)</td>
<td>0.02</td>
<td>0.02</td>
<td>0.88</td>
</tr>
</tbody>
</table>

* Statistically Significant

Interactions. There was not a four-way interaction that reached significance.

There was one statistically significant three-way interaction among familiarity, transparency, and context, F(1, 32) = 114.29, MS= 72.06, p<0 .001, partial η² = .78 with
an observed power of 1.00. Post hoc testing using the Bonferroni procedure demonstrated a significant difference in performance due to context. Specifically, participants performed significantly worse under the familiar, opaque, out-of-context condition ($M = 11$), and far worse under the unfamiliar, opaque, out-of-context condition ($M = 4.94$) than in any of the in-context conditions (See Figure 4).

![Three Way Interaction: Familiarity x Transparency x Context](image)

**Figure 4.** The statistically significant three-way interaction among accuracy scores in the following conditions and each of their two levels: familiarity, transparency, and context, with language groups collapsed.

**Note.** The abbreviations used signify the following idiomatic conditions: FTI is familiar, transparent, in-context; FTO is familiar, transparent, out-of-context; FOI is familiar, opaque, in-context; FOO is familiar, opaque, out-of-context; UTI is unfamiliar, transparent, in-context; UTO is unfamiliar, transparent, out-of-context; UOI is unfamiliar, opaque, in-context; and UOO is unfamiliar, opaque, out-of-context. Furthermore, the confidence intervals (95th percentile) of each condition (e.g., Familiarity: familiar and unfamiliar) did not overlap with each other, ensuring that they were each significantly different. Lastly, the most variable performance occurred under
the no context and unfamiliar conditions, and the least amount of variability occurred in
the in-context condition (see Figure 5 for the confidence intervals of these pair-wise
comparisons).

Figure 5. Confidence intervals of familiarity, semantic transparency, and context
variables displayed in mean accuracy values and illustrated with error bars.

Note. Values represent the mean of both language groups collapsed together since group
was not statistically significant.

There were also three statistically significant two-way interactions among the
idiomatic variables. First, there was a significant interaction between familiarity and
transparency, $F(1, 32) = 77.63$, $MS = 74.13$, $p<0.001$, and partial $\eta^2 = .71$ with an observed power of 1.00. Post hoc testing using the Bonferroni adjustment demonstrated that all conditions were significantly different, with the weakest performance observed under the unfamiliar, opaque condition ($M = 8.34$) and the best performance observed under the familiar, transparent condition ($M = 11.66$) (see Figure 6 for the confidence intervals of each of these conditions).

![Figure 6. Confidence intervals of the familiarity and semantic transparency variables displayed in mean accuracy values and illustrated with error bars.](image-url)
*Note.* Values represent the mean of both language groups collapsed together since group was not statistically significant.

Secondly, there was a significant interaction between familiarity and context, $F(1, 32) = 442.15$, $MS = 252.37$, $p<0.001$, and partial $\eta^2 = .93$ with an observed power of 1.00. Further post hoc testing using the Bonferroni procedure revealed a significant difference under the unfamiliar, out-of-context condition ($M = 7.23$) (see Figure 7 for confidence intervals of these variables).

*Figure 7.* Confidence intervals of familiarity and context variables displayed in mean accuracy values and illustrated with error bars.
Note. Values represent the mean of both language groups collapsed together since group was not statistically significant.

Lastly, there was a significant interaction between transparency and context, $F(1, 32) = 268.21$, $MS = 121.78$, $p < 0.001$ and partial $\eta^2 = .89$ with an observed power of 1.00. Again, post hoc testing using the Bonferroni adjustment found a significant difference under the opaque condition, with performance decreasing when idioms were presented out-of-context (see Figure 8 for confidence intervals of these variables).

Figure 8. Confidence intervals of semantic transparency and context variables displayed in mean accuracy values and illustrated with error bars.
Note. Values represent the mean of both language groups collapsed together since group was not statistically significant.

In addition, there were two other interactions approaching significance. The interaction of familiarity x context x group approached significance, F (1, 32) = 3.71, MS = 2.12, p = 0.06, partial $\eta^2 = .10$ with an observed power of 0.46. Lastly, there was a three-way interaction with a trend towards significance involving transparency x context x group, F(1, 32) = 2.07, MS = 0.94, p = 0.16, a partial $\eta^2 = .78$ with an observed power of 1.00.

Taken together, these interactions suggest that, although there were no significant group interactions, the idiomatic conditions did interact significantly. Overall, participants performed better with familiar, transparent idioms in context. Participants performed better on unfamiliar idioms when they were transparent and better on opaque idioms when they were familiar. Furthermore, participants performed better on both familiar and unfamiliar idioms when they were presented within context. Specifically, context was advantageous when interpreting unfamiliar idioms. Lastly, although context appeared to benefit participants under all idiomatic conditions, context was particularly helpful when given opaque idioms. Moreover, group interactions were approaching significance, suggesting that a larger sample size and greater scrutiny of participants’ language experience may lead to significant results.

Main effects. A main effect was found for the familiarity variable, F (1, 32) = 210.47, MS = 288.24, p < 0.001, partial $\eta^2 = .87$ with an observed power of 1.00. Both groups performed better ($M = 46.21$) in the familiar idiom condition than in the unfamiliar idiom condition ($M = 37.97$). Independently, the monolingual group had more
correct answers ($M = 46.94$) when interpreting familiar idioms versus unfamiliar idioms ($M = 38.18$). Similarly, the bilingual group did better on the familiar idioms ($M = 45.47$) than on the unfamiliar idioms ($M = 37.76$).

The semantic transparency variable also had a main effect, $F(1,32)= 121.62$, $MS = 108.77$, $p<0.001$, and partial $\eta^2 = 0.79$ with an observed power of 1.00. Both groups performed better ($M = 44.62$) in the transparent idiom condition then in the opaque idiom condition ($M = 39.56$). The monolingual group produced more correct answers ($M = 44.94$) with the transparent idioms contrasted with the opaque idioms ($M = 40.18$). Similarly, the bilingual group did better with the transparent idioms ($M = 44.29$) versus the opaque idioms ($M = 38.94$).

In terms of the context variable, there was a main effect for context, $F(1, 32) = 473.286$, $MS = 425$, $p<0.001$, partial $\eta^2 = 0.93$ with an observed power of 1.00. Both groups performed better ($M = 47.18$) in the within-context condition than the without-context condition ($M = 37.09$). The monolingual group provided more correct answers ($M = 47.59$) with the idioms in context than with idioms out-of-context ($M = 37.53$). Similarly, the bilingual group did better on the idioms presented in-context ($M = 46.76$) compared with the idioms out-of-context ($M = 36.65$).

These three significant main effects illustrated that the participants performed distinctively in each binary category of each idiomatic condition (familiarity, semantic transparency, and context). In other words, participants performed better with familiar rather than unfamiliar idioms, with transparent rather than opaque idioms, and with context rather than without. These findings validated that each of the idiomatic conditions were systematically controlled. Overall, participants performed less well on unfamiliar
than familiar idioms ($M = 46.21$), less well on opaque ($M = 39.56$) than transparent idioms ($M = 44.62$), and less well on idioms out-of-context ($M = 37.09$) than on idioms in-context ($M = 47.18$).

**Results: Qualitative Analyses**

Since the statistical analyses only addressed the data in a binary manner (whether accurate or inaccurate), a qualitative error analysis was also carried out. Each incorrect answer was coded as being literal and incorrect or figurative and incorrect.

**Error analysis.** Each of the four conditions (familiar transparent, familiar opaque, unfamiliar transparent, and unfamiliar opaque) in- and out-of-context was analyzed. The total number of literal and figurative errors for each language group is illustrated in Table 2.5.

<table>
<thead>
<tr>
<th>Condition</th>
<th>M Literal Errors</th>
<th>B Literal Errors</th>
<th>M Figurative Errors</th>
<th>B Figurative Errors</th>
<th>Total</th>
</tr>
</thead>
<tbody>
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<td>1</td>
<td>1</td>
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<tr>
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<td>2</td>
<td>5</td>
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<td>16</td>
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<td>0</td>
<td>3</td>
<td>4</td>
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<td>8</td>
<td>17</td>
<td>35*</td>
</tr>
<tr>
<td>UTI</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>UTO</td>
<td>3</td>
<td>1</td>
<td>39</td>
<td>39</td>
<td>82</td>
</tr>
<tr>
<td>UOI</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>UOO</td>
<td>32</td>
<td>28</td>
<td>87</td>
<td>93</td>
<td>240</td>
</tr>
</tbody>
</table>

* One answer was left blank and was counted as an error.
Note. The abbreviations used signify the following idiomatic conditions: FTI is familiar, transparent, in-context; FTO is familiar, transparent, out-of-context; FOI is familiar, opaque, in-context; FOO is familiar, opaque, out-of-context; UTI is unfamiliar, transparent, in-context; UTO is unfamiliar, transparent, out-of-context; UOI is unfamiliar, opaque, in-context; and UOO is unfamiliar, opaque, out-of-context.

One example of an idiom that seven participants missed was the transparent, familiar idiom: *take someone under one’s wing*. The idiom short story context was:

The more experienced pilot taught the newcomer, Jerry, how to fly the jet. He *took Jerry under his wing*.

The choices were a) to give someone your seat on a plane, b) to offer someone guidance, and c) to teach someone to fly. Five of the participants who missed the correct answer *b) to offer someone guidance*, chose *c) to teach someone to fly*, the literal response, and one bilingual and one monolingual chose the figurative, but incorrect response a) *to give someone your seat on a plane*.

Taken as a whole, fewer errors were made when given familiar idioms (62 errors in total) rather than unfamiliar idioms (341 errors in total). Also, fewer errors were made with transparent idioms (115 errors in total) than opaque idioms (288 errors in total). Furthermore, more errors were made when idioms were presented without context (373 errors in total) rather than within context (30 errors in total).

Overall, the majority of errors occurred when idioms were presented out-of-context, particularly when they were both opaque and unfamiliar. Of interest, there were far fewer literal errors (104 errors in total) than figurative errors (317 errors in total). Lastly, the bilinguals had either equal or more errors except in two conditions: a) fewer
literal errors on the unfamiliar, transparent idioms out-of-context and b) fewer literal errors on the unfamiliar, opaque idioms out-of-context.

*Item analysis.* Lastly, an item analysis was conducted to detect any idiom scenarios that should be eliminated before going forward with the main study. The criterion was that any items presented in context that 50% or more of the participants answered incorrectly were considered invalid questions. None of the items met this less than 50% criterion; that is, all of the items presented in context were correctly interpreted at least 50% of the time by all participants, both bilinguals and monolinguals.

The item analysis was performed on idiom scenarios in-context instead of idiom scenarios out-of-context since those items out-of-context required either prior knowledge (e.g., the participant was familiar with the idiom already) or guessing (e.g., the participant was unfamiliar with the idiom and had to guess its meaning based on the three multiple choice responses without any supporting context).

In summary, the qualitative analyses echoed the quantitative analyses. Participants perform distinctively under each idiomatic condition’s two categories. Furthermore, according to the item analysis, the items and their short story context appeared valid and the results paralleled results from past research. Namely, there was a pattern of heightened performance with familiar versus unfamiliar idioms, transparent versus opaque idioms, and context supports idiom comprehension in general.

*Discussion*

The independent t-test demonstrated that there was a significant difference between the performances of the USF bilinguals and monolinguals on the idiom measure. However, when each variable was analyzed separately, there was no language group
effect. Therefore, it appeared that there was an overall difference between the groups when total score (i.e., all 96 items under all conditions crossed) was considered. As demonstrated through the one three-way and three two-way significant interactions, the three idiomatic conditions (familiarity, semantic transparency, and context) interacted amongst each other. There was also a main effect for each of the three idiomatic conditions. Overall, all students performed better under the less taxing conditions: familiar, transparent idioms in context. Moreover, these findings suggested that the idiomatic conditions were systematically controlled, and each condition should remain in the main study’s idiom comprehension measure (ICM).

An interesting finding of the pilot data was that the USF monolinguals, although not significantly so, did perform better that the USF bilinguals in each condition (see Table 2.3 for descriptive data). Furthermore, there appears to be more variability among the bilinguals’ scores in general than the monolinguals’ scores. Recruiting only Spanish-English bilinguals and using a questionnaire to explore participants’ language history and language experience during the main study should group the bilinguals in a more refined manner (i.e., late versus early English learners, as well as high- or low-use Spanish speakers). This grouping strategy aimed to allow for exploration of any variability or patterns evident in the bilingual sample of the main study. The interactions approaching significance confirmed that a difference may exist between the language groups given a more refined and larger sample.

As for the qualitative analyses, the item analysis demonstrated that no question was missed more than 50% of the time by bilingual or monolingual participants. Furthermore, for most items missed within context (i.e., 20 figurative but incorrect
responses and 10 literal and incorrect responses) participants with errors tended to choose the figurative but incorrect meaning over the literal meaning. This pattern demonstrated that the alternative figurative but incorrect meaning was challenging to at least some monolingual and bilingual participants with some college education. These analyses illustrated the importance of proceeding with the main study using a balanced and modified version of this measure with a larger sample of adolescent bilingual (Spanish-English) and monolingual (English-only) participants.

Method: Part 2

Participants: Adolescent Pilot Study on Familiarity Ratings

The second portion of the pilot study was conducted at a public high school in a rural area of West Central Florida. The participating high school had a population of 1,633 students at the time of the study. During the 2005-2006 academic year, the student population consisted of 69% Caucasian, 22% African American, 8% Latino and 1% other (e.g., Asian and Indian students) (Polk County Public Schools, 2006). During that academic year enrollment consisted of 518 freshman, 491 sophomores, 358 juniors, and 266 seniors.

The inclusion criteria for the adolescents specified that all participants had to be a) currently enrolled in high school, b) between 13-18 years-old, and c) a self-reported (and teacher-confirmed) native, monolingual English speaker. Anyone who was receiving speech and/or language services for a speech and/or language impairment and was not a native, monolingual English-speaker was excluded from the study. The exclusionary criteria were necessary in order to obtain a sample of typically developing, monolingual English-speaking adolescents.
The final sample consisted of 47 sophomores. Four were African American and 43 were Caucasian. Of the 47, 18 were male and 29 were females. Furthermore, 40 of the 47 participants reported their dates of birth. Of the 40 participants, their mean age was 15 years, 8 months old.

Materials: Development of the Familiarity Rating Form

The investigator deemed it important to obtain familiarity ratings for the 48 idioms from a sample that would reflect the demographics of the sample for the main study. To rate the familiarity of the idioms, a rating form was constructed. A first step in devising the rating measure was to consult past literature for strategies on rating the familiarity of lexical items. Dale (1965) classified the extent of word knowledge into four categories: a) never heard it before, b) heard it, but doesn’t know what it means, c) recognizes it in context as having to do with _____, and d) knows it well. In a similar manner, Beck, McKeown, and Omanson (1987) described word knowledge as falling on a continuum of: a) no knowledge, b) general sense, c) narrow, context-bound knowledge, d) having knowledge of a word but not being able to recall it readily enough to use it in appropriate situations, and e) rich, decontextualized knowledge of a word’s meaning, its relationship to other words, and its extension to metaphorical uses.

These two paradigms for capturing the relative nature of word knowledge were extended to conceptualize idiomatic knowledge as representing a continuum of familiarity. Specifically, each of the 48 idioms (12 familiar transparent, 12 familiar opaque, 12 unfamiliar transparent, and 12 unfamiliar opaque) were listed without any contextual support, along with three columns labeled: a) know it, b) heard it, but don’t know what it means, and c) never heard it before. This simplified continuum allowed
participants to place a check mark in the column that best described their knowledge of each of the 48 idioms. Each form was numbered so that students remained anonymous.

Procedure

After obtaining approval from the Polk County Public Schools (see Appendix F), all participants completed a consent form (see Appendix G). Monolingual English-speaking students were recruited through a reading teacher’s four classes. The teacher, who distributed and collected the consent forms over a month-long period, announced the study’s premise, that the participants would complete a short checklist, and that there was a chance for one student to win two student movie tickets in each of the four classes. The consent forms were signed by the participants’ parents and the participants also signed an assent. After giving verbal assent, the participating students were given the following directions orally:

> *Idioms are figurative or non-literal language like ‘raining cats and dogs’ or ‘bought the farm’. I am creating an idiom test and need your help to decide which idioms on my list are familiar to you. When you receive your form, please read each idiom carefully and decide if you a) Know it, b) Heard it before, but do not know what it means, or c) Never heard it before. Then, just place a check mark under the appropriate column. If at any time you wish to stop completing this form, you may do so without any consequences whatsoever. This is completely voluntary. If you have any questions feel free to ask me. After everyone has finished completing his/her form, I will randomly choose a number like the ones listed on your forms. The person’s number who corresponds with the number*
chosen will receive a pair of movie tickets. I would like to thank all of you for participating.

The familiarity forms (see Appendix H) were completed independently in groups of approximately 30 students within each of the four classes. All participants completed the familiarity rating form within 10 to 15 minutes on May 12, 2006 (the students who were not participating worked on their class assignment instead). This method expedited the process and there was minimal disruption of the students’ and teacher’s schedules.

As noted earlier, an incentive, a prize of 2 student movie tickets for each class (8 tickets in total) was raffled upon completion of the forms. As stated on the consent forms, all students who had turned in a consent form were included in the raffle, even those who were absent on May 12th. In each of the four classes, after all participants had completed the familiarity form, the students’ assigned anonymous numbers were written on small index cards, the numbers were shuffled in a bag, and one randomly drawn number was chosen. The four students received two student movie gift certificates valued at approximately $11 for each pair. In addition, a small gift certificate of $25 to an office supply store was given to the principal as a token of appreciation for allowing the research to be conducted at his school.

Data Analysis

Data from each of the four classes were first analyzed separately in order to detect any differences related to class membership. The familiarity ratings (know it; heard it, but don’t know what it means; and never heard it before) were each assigned a point value. These values ranged from 1 point for a never heard it before response, to 2 points for a heard it, but don’t know what it means response, and 3 points for a know it response.
Then, the number of check marks in each column for each idiom for each class was calculated. Each column’s tallies were multiplied by 1, 2, or 3, depending on the column’s value. Next, each idiom’s row value was tallied. For example, there were eight participants in the third class. For the idiom *blow off steam*, all eight participants marked the column *know it*, for a total of 24 points (8 participants x 3 points each) for that particular idiom.

After the totals for each class were calculated for each idiom, each idiom’s total value was converted into ratios by dividing the totals by the number of participants in each class. For example, the idiom *hold one’s head up* scored a 19 for the class with 8 participants, so its ratio was a 2.38 (19/8). Totals were converted into ratios so that the point totals for each class could be compared regardless of the number of participants in each class.

Next, each idiom’s totals for all classes combined were converted into a ratio by dividing by the total number of participants ($N = 47$). For example, the idiom *hold one’s head up* received the following scores: 44, 37, 19, and 20 for a total score of 120. Thus, the ratio for this score was 2.55 (120/47). Table 2.6 displays each idiom’s total familiarity rating across the 47 participants, in descending order, per idiom category.

Table 2.6
Familiarity Ratings in Descending Order by Idiom Category

<table>
<thead>
<tr>
<th>Idiom</th>
<th>Familiarity Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. Burning the candle at both ends</td>
<td>1.66</td>
</tr>
<tr>
<td>11. Take a shot in the dark</td>
<td>2.23</td>
</tr>
</tbody>
</table>
(Table 2.6 continued)

<table>
<thead>
<tr>
<th>Expression</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Hold one’s head up</td>
<td>2.55</td>
</tr>
<tr>
<td>7. Cry over spilled milk</td>
<td>2.60</td>
</tr>
<tr>
<td>2. Go by the book</td>
<td>2.75</td>
</tr>
<tr>
<td>5. Keep a straight face</td>
<td>2.81</td>
</tr>
<tr>
<td>9. Hold your tongue</td>
<td>2.85</td>
</tr>
<tr>
<td>12. The early bird catches the worm</td>
<td>2.85</td>
</tr>
<tr>
<td>4. Blow off steam</td>
<td>2.89</td>
</tr>
<tr>
<td>3. Take someone under one’s wing</td>
<td>2.92</td>
</tr>
<tr>
<td>6. Right under your nose</td>
<td>2.92</td>
</tr>
<tr>
<td>10. Get off on the wrong foot</td>
<td>2.96</td>
</tr>
</tbody>
</table>

**Familiar Opaque**

<table>
<thead>
<tr>
<th>Expression</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>20. Go to pot</td>
<td>1.32</td>
</tr>
<tr>
<td>21. Wet behind the ears</td>
<td>1.75</td>
</tr>
<tr>
<td>15. Paint the town red</td>
<td>1.85</td>
</tr>
<tr>
<td>22. Jump through hoops</td>
<td>2.19</td>
</tr>
<tr>
<td>24. To flip one’s lid</td>
<td>2.34</td>
</tr>
<tr>
<td>14. Bring the house down</td>
<td>2.36</td>
</tr>
<tr>
<td>16. Have a soft spot in one’s heart</td>
<td>2.43</td>
</tr>
<tr>
<td>23. Go cold turkey</td>
<td>2.45</td>
</tr>
<tr>
<td>19. At the drop of a hat</td>
<td>2.51</td>
</tr>
<tr>
<td>17. Chip off the old block</td>
<td>2.62</td>
</tr>
</tbody>
</table>
(Table 2.6 continued)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>18.</td>
<td>Spill the beans</td>
<td>2.72</td>
</tr>
<tr>
<td>13.</td>
<td>Beat around the bush</td>
<td>2.89</td>
</tr>
</tbody>
</table>

**Unfamiliar Transparent**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>34.</td>
<td>To fall into the apples</td>
<td>1.06</td>
</tr>
<tr>
<td>33.</td>
<td>To fall down with four horseshoes up in the air</td>
<td>1.12</td>
</tr>
<tr>
<td>27.</td>
<td>For a good hunger there is no hard bread</td>
<td>1.17</td>
</tr>
<tr>
<td>32.</td>
<td>It’s the water drop that makes the vase overflow</td>
<td>1.21</td>
</tr>
<tr>
<td>30.</td>
<td>To try to make a hole out of water</td>
<td>1.30</td>
</tr>
<tr>
<td>36.</td>
<td>To throw flowers to somebody</td>
<td>1.36</td>
</tr>
<tr>
<td>35.</td>
<td>To cut a pear in two</td>
<td>1.47</td>
</tr>
<tr>
<td>28.</td>
<td>To shoot sparrows with cannons</td>
<td>1.49</td>
</tr>
<tr>
<td>26.</td>
<td>To run around like scalded pigs</td>
<td>1.49</td>
</tr>
<tr>
<td>31.</td>
<td>To hold someone’s leg</td>
<td>1.53</td>
</tr>
<tr>
<td>29.</td>
<td>To be drowning in a glass of water</td>
<td>1.57</td>
</tr>
<tr>
<td>25.</td>
<td>To be caught between two fires</td>
<td>1.89</td>
</tr>
</tbody>
</table>

**Unfamiliar Opaque**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>37.</td>
<td>The turtle is shrouded</td>
<td>1.02</td>
</tr>
<tr>
<td>38.</td>
<td>To eat the leaf</td>
<td>1.06</td>
</tr>
<tr>
<td>41.</td>
<td>To have salt in your pumpkin</td>
<td>1.06</td>
</tr>
<tr>
<td>44.</td>
<td>To pick up a log</td>
<td>1.06</td>
</tr>
<tr>
<td>45.</td>
<td>To eat on the thumb</td>
<td>1.06</td>
</tr>
<tr>
<td>42.</td>
<td>To whistle in your thumb</td>
<td>1.11</td>
</tr>
</tbody>
</table>
It was then determined, from a qualitative perspective, that any score, which equaled or fell below two points (i.e., heard it, but don’t know what it means) would be considered unfamiliar. In other words, for the particular idiom, most of the participants had marked it as heard it, but do not know what it means or never heard it before.

Following a similar procedure, any score above two points was qualitatively considered as familiar.

Results

All of the unfamiliar idioms were rated as unfamiliar by all four classes, with ratings ranging from 1.02 to 1.89. All but four of the familiar idioms were rated as familiar by all four classes, with ratings ranging from 2.19 to 2.96. The four idioms that were rated as unfamiliar were: a) burning the candle at both ends (ratio=1.66), b) paint the town red (ratio=1.85), c) go to pot (ratio=1.32), and d) wet behind the ears (ratio=1.75).

Interestingly, in comparing the responses of the 34 undergraduates from the first pilot study with the 47 adolescents in the second pilot study for these four idioms, 10 of the undergraduates (five of whom were monolingual English speakers) also did not know
the meaning of *burning the candle at both ends* when presented out of context. Instead, they interpreted its meaning as *to not be wasteful* rather than the correct interpretation *to work and/or play too hard without enough rest*. Also, 12 undergraduates (four of whom were monolinguals) misinterpreted the idiom *paint the town red* when presented out of context as *to make everyone in town mad* rather than the correct interpretation *to go out and celebrate*. There were similar difficulties with *go to pot* out of context. Seven of the undergraduates (two of whom were monolingual) misinterpreted the idiom as meaning *to put in the trashcan* rather than *to deteriorate*.

However, for *wet behind the ears*, all but one monolingual undergraduate correctly interpreted it, while the adolescent sample reported low familiarity (see Table 2.6, idiom #21). These differences in familiarity may have been unforeseen generational and/or regional differences between the examiner and some participants.

To eliminate any familiar idioms that were interpreted as too unfamiliar or too familiar, or any unfamiliar idioms that were rated as too familiar or too unfamiliar, the two idioms in each category with the highest rating and the lowest rating were eliminated as a way to control for ceiling and floor effects within each category. In the familiar transparent idiom category, *burning the candle at both ends* (familiarity rating = 1.66) and *get off on the wrong foot* (familiarity rating = 2.96) were eliminated. *Go to pot* (familiarity rating = 1.32) and *beat around the bush* (familiarity rating = 2.89) were both eliminated from the familiar opaque idiom category. In the unfamiliar idiom category, two transparent idioms were eliminated: *to fall into the apples* (familiarity rating=1.06) and *to be caught between two fires* (familiarity rating=1.89). Finally, two unfamiliar,
opaque idioms were eliminated: *the turtle is shrouded* (familiarity rating=1.02) and *to put a finger in one’s eye* (familiarity rating=1.54).

After eliminating the eight idioms, a t-test was conducted to compare the familiarity ratings of the remaining 20 familiar idioms with the remaining familiarity ratings for the 20 unfamiliar idioms. The combined familiarity ratings for the transparent familiar and opaque familiar idioms had a mean of 2.53 ($SD = 0.34$). The combined familiarity ratings for transparent unfamiliar and opaque unfamiliar idioms had a mean of 1.26 ($SD = 0.17$). The t-test results indicated a statistically significant difference ($p<0.001$) between the familiarity ratings for the familiar and unfamiliar idioms with an observed t value of 14.95 and a critical t value of +/- 2.021.

After eliminating these eight idioms, a box plot comparing the familiarity ratings for the familiar (including the 10 transparent and 10 opaque) and unfamiliar (including the 10 transparent and 10 opaque) idioms demonstrated an absence of overlap between and the two familiarity categories (see Figure 9). (A previous box plot that included the eight idioms did demonstrate overlap.) This absence of overlap provided justification for the conclusion that the two familiarity categories represented local norms and were not arbitrary divisions based solely on previous research, including cross-linguistic studies.
Figure 9. Boxplot of familiarity ratings (ranging from 1-3) as a function of familiar and unfamiliar idioms.
**Discussion**

The adolescent pilot study confirmed the familiarity of the familiar (i.e., familiar, American) idioms and the unfamiliarity of the unfamiliar (i.e., unfamiliar, European) idioms. More importantly, through the adolescent pilot study, local normative data on idiom familiarity were collected. Therefore, the labels familiar and unfamiliar were no longer arbitrary categories. Furthermore, the adolescent participants in the pilot study matched the participants in the main study demographically.

**Construction of the Final Idiom Comprehension Measure**

*Balancing Items and Syllable Length*

To minimize memory retention due to repetition of the same idiom in- and then out-of-context during the main study, the items presented out-of-context differed from the items presented in-context. That is to say, in the main study, one participant received items #1-5 in-context and items #6-10 out-of-context, while another participant received items #1-5 out-of-context and items #6-10 in context so that #1 was balanced with item #6.

In constructing the final idiom measure, each idiom’s syllable length was calculated. These syllable counts ranged from 3 to 11 syllables in length (see Table 2.7). The items were first matched in terms of each idiom’s syllable length (see Table 2.8). In other words, an opaque familiar idiom consisting of four syllables was matched with another opaque familiar idiom consisting of four syllables. The rationale for this procedure was to match the time it takes to read an idiom on Form A and Form B equivalent. This procedure also allowed for balance in the length of items #1-5 on one form and items #1-5 on the other form; hence, the idiom comprehension measure (ICM)
consisted of Form A and Form B (see Appendix I). The purpose of constructing two forms was to avoid confounding the measure by controlling and counterbalancing the order of the items presented in and out of context. Forms A and B also allowed for participants’ responses to be compared accurately. The out-of-context items in Form A totaled 117 syllables, while the out-of-context idioms in Form B totaled 119 syllables.

Table 2.7

<table>
<thead>
<tr>
<th>Idiom</th>
<th>Syllable Counts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Hold one’s head up</td>
<td>4</td>
</tr>
<tr>
<td>2. Go by the book</td>
<td>4</td>
</tr>
<tr>
<td>3. Take someone under one’s wing</td>
<td>7</td>
</tr>
<tr>
<td>4. Blow off steam</td>
<td>3</td>
</tr>
<tr>
<td>5. Keep a straight face</td>
<td>4</td>
</tr>
<tr>
<td>6. Right under my nose</td>
<td>5</td>
</tr>
<tr>
<td>7. Cried over spilled milk</td>
<td>5</td>
</tr>
<tr>
<td>8. Hold your tongue</td>
<td>3</td>
</tr>
<tr>
<td>9. Take a shot in the dark</td>
<td>6</td>
</tr>
<tr>
<td>10. The early bird catches the worm</td>
<td>8</td>
</tr>
<tr>
<td>11. Bring the house down</td>
<td>4</td>
</tr>
<tr>
<td>12. Paint the town red</td>
<td>4</td>
</tr>
<tr>
<td>13. Have a soft spot in one’s heart</td>
<td>7</td>
</tr>
<tr>
<td>14. Chip off the old block</td>
<td>5</td>
</tr>
<tr>
<td>15. Spill the beans</td>
<td>3</td>
</tr>
</tbody>
</table>
(Table 2.7 continued)

16. At the drop of the hat       6
17. Wet behind the ears         5
18. Jump through hoops          3
19. Go cold turkey              4
20. To flip one’s lid           4
21. To run around like scalded pigs  8
22. For a good hunger there is no hard bread 10
23. To shoot sparrows with cannons  7
24. To be drowning in a glass of water 10
25. To try to make a hole in water 9
26. To hold someone’s leg       5
27. It’s the water drop that makes the vase overflow 11
28. To fall down with four horseshoes up in the air 11
29. To cut a pear in two        6
30. To throw flowers to somebody 8
31. To eat the leaf             4
32. To pet the horse first      5
33. To be at the green          5
34. To have salt in your pumpkin 7
35. To whistle in your thumb    6
36. To pick up a log            5
37. To eat on the thumb         5
(Table 2.7 continued)

38. To play the donkey to get bran 8
39. Between dog and wolf 5
40. To lay a rabbit on someone 8

Table 2.8
Syllable, Familiarity, and Condition Match: Form A and Form B
Form A: Syllable Count/Familiarity Rating  Form B: Syllable Count/Familiarity Rating

<table>
<thead>
<tr>
<th>Familiar Transparent – 24 syllables total</th>
<th>Familiar Transparent – 25 syllables total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 4/2.55</td>
<td>2. 4/2.75</td>
</tr>
<tr>
<td>3. 7/2.92</td>
<td>10. 8/2.85</td>
</tr>
<tr>
<td>8. 3/2.85</td>
<td>4. 3/2.89</td>
</tr>
<tr>
<td>6. 5/2.92</td>
<td>9. 6/2.23</td>
</tr>
<tr>
<td>7. 5/2.60</td>
<td>5. 4/2.81</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Familiar Opaque – 22 syllables total</th>
<th>Familiar Opaque – 23 syllables total</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. 4/2.36</td>
<td>20. 4/2.34</td>
</tr>
<tr>
<td>12. 4/1.85</td>
<td>17. 5/1.75</td>
</tr>
<tr>
<td>16. 6/2.51</td>
<td>13. 7/2.43</td>
</tr>
<tr>
<td>14. 5/2.62</td>
<td>19. 4/2.45</td>
</tr>
<tr>
<td>18. 3/2.19</td>
<td>15. 3/2.72</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unfamiliar Transparent – 43 syllables total</th>
<th>Unfamiliar Transparent – 41 syllables total</th>
</tr>
</thead>
<tbody>
<tr>
<td>24. 10/1.57</td>
<td>22. 10/1.17</td>
</tr>
<tr>
<td>28. 11/1.12</td>
<td>27. 11/1/21</td>
</tr>
</tbody>
</table>
(Table 2.8 continued)

25. 9/1.30  
21. 8/1.49

23. 7/1.49  
30. 7/1.36

29. 6/1.47  
26. 5/1.53

**Unfamiliar Opaque – 28 syllables total**  **Unfamiliar Opaque – 30 syllables total**

36. 5/1.06  
37. 5/1.06

38. 8/1.23  
40. 8/1.13

33. 5/1.23  
39. 5/1.34

35. 6/1.11  
34. 7/1.06

31. 4/1.06  
32. 5/1.17

*Note.* Form A had a total of 117 syllables and Form B had a total of 119 syllables.

**Balancing Familiarity Ratings**

Next, Forms A and B were matched based on the previously described familiarity ratings (see Table 2.8). To ensure that the two forms were balanced in terms of syllable number and familiarity of the idioms, two separate *t*-tests were conducted. The first *t*-test examined the number of syllables in each form. The 117 syllables in Form A and the 119 syllables in Form B were determined to not significantly differ (see Appendix B for a list of non-significant *t*-test values). The second *t*-test also confirmed that there were no significant differences between Form A and Form B in terms of familiarity ratings (see Appendix B). Therefore, the two forms were balanced in terms of syllable count and idiom familiarity. Moreover, Form A presented the same 20 idioms in-context as Form B did out-of-context; and Form B presented the same idioms in-context as Form A did out-of-context.
Balancing Response Accuracy

Lastly, the accuracy totals of each idiom on each form were calculated. Since there were 34 participants in the first pilot study, the possible scores ranged from 0 (no one answered correctly) to 34 (all answered correctly). Both of the forms’ 40 questions’ accuracy totals were calculated. Form A had a mean accuracy of 29.58 (SD = 7.87). Form B had a mean accuracy of 29.75 (SD = 7.34). Not surprisingly, a t-test demonstrated that the two forms were not significantly different (see Appendix B), indicating that the level of difficulty of the items on Form A did not significantly differ from the level of difficulty of the items on Forms B.

Two final modifications were conducted before going forth with the main study. First, the pronoun one/one’s in the original measure was changed to you/your in the final measure in order to increase the level of readability within an adolescent population. Secondly, in the final analyses of the idiom measure two idioms were deemed to have transparent translations from English to Spanish: It’s the water drop that makes the vase overflow and To be drowning in a glass of water. Therefore, these two transparent, unfamiliar, Spanish-derived idioms were replaced by two transparent, unfamiliar, French-derived idioms: To be a monkey on a branch and To put on the sails. To be a monkey on a branch has 8 syllables and replaced the Spanish idiom It’s the water drop that makes the vase overflow (13 syllables); and To put on the sails has 5 syllables and replaced the Spanish idiom To be drowning in a glass of water (10 syllables). Before replacement, Form A had 117 syllables and afterwards had 112 syllables; and Form B had 119 syllables, and afterwards had 114 syllables. The two forms were balanced in familiarity,
semantic transparency, syllable length, and readability level when presented within context.
Chapter Three

Method

Experimental Design

This study utilized a mixed quasi-experimental design with between- and within-subject variables. The between-subject variable was language group (Spanish/English-speaking bilingual or English-speaking monolingual) and there were six within-subjects variables: a) idiom familiarity (familiar and unfamiliar), b) idiomatic semantic transparency (transparent and opaque), c) idiom context (with and without short-story contexts), d) a reading comprehension task, e) a comprehension monitoring (error detection) task, and f) a multiple meaning (synonym) vocabulary task. The dependent variables included the scores from the idiom measure, the reading comprehension task, the comprehension monitoring task, and the multiple meanings vocabulary task.

Participants

Sample and School Characteristics

Sample size and characteristics. The study was conducted in the spring semester of the 2006-2007 school year. Thirty-one high school students for each language group were recruited (N = 62). There were 14 monolingual males, 17 monolingual females, 12 bilingual males, and 19 bilingual females in the sample. All participants were Caucasian, except for two monolingual participants (one male and one female) who were African American. In the monolingual group there were four 9th graders, 19 10th graders, four 11th
graders, and four 12th graders. In the bilingual group there were five 9th graders, 15 10th graders, eight 11th graders, and three 12th graders. The participants ranged in age from 14-years-old to 18; 6- years-old (years; months). The monolinguals ranged in age from 14; 10 – 18; 6 years old ($M = 16; 4, SD=0.97$) and the bilinguals ranged in age from 14; 9 – 17; 8 years old ($M = 16; 8, SD= 1.03$). There was not a significant difference in ages between the monolingual and bilingual language groups according to the results of an independent $t$-test (see Appendix B).

Sample school characteristics. Requests to conduct research in the Polk County Public Schools (PCPS) as well as in the School District of Hillsborough County (SDHC) were approved (see Appendices J and K). The student populations of both school districts were diverse. For example, the PCPS student body was approximately 55 percent Caucasian, 23 percent African American, 20 percent Latino, and 2 percent other (Polk County Public Schools, 2007). Furthermore, there were more than 5,000 students whose primary language is other than English in the PCPS (Polk County Public Schools, 2007). The SDHC student body was approximately 44 percent Caucasian, 22 percent African American, 26 percent Latino, 2 percent Asian/Pacific Islander, 0.3 percent Native American, and about 6 percent other (School District of Hillsborough County, 2005). More than 10 percent of the student population in the SCHD spoke a language other than English (School District of Hillsborough County, 2005).

All participants enrolled in the study were current high school students within the public schools of either Polk or Hillsborough County. These school districts were located in west central Florida. The three participating schools were all in rural areas within the two counties. A total of eight monolingual and nine bilingual participants were attending
public schools in Polk County and 23 monolingual participants and 22 bilingual participants were attending a public school in Hillsborough County. All SDHC participants attended the same school. Students from two schools in PCPS participated, eight monolinguals and three bilinguals from one high school and six bilingual participants came from a second school.

**Recruitment**

To recruit participants, high school principals, English as a Second Language (ESOL) instructors, general education teachers, and reading teachers assisted in identifying students who met the study’s inclusionary criteria. The principal investigator visited the classrooms of participating teachers for three purposes: a) to explain the voluntary nature of the study; b) to distribute parent consent forms (see Appendix L) in English and Spanish; and c) to describe the incentives for participation. Specifically, upon completion of the study, five student participants from each school won two movie tickets (together worth approximately $15). The movie tickets were raffled following the same procedure used in the pilot study.

The students were asked to return the parent consent forms within one week of disbursement if they chose to participate. In addition, each participant also signed an assent form (see Appendix M) on the day he/she participated in the study. The principal investigator distributed consent forms in at least three waves at each participating school in order to increase enrollment.

**Inclusion Criteria**

All participants had to meet four general inclusion criteria: a) have self-reported normal or aided hearing adequate for understanding oral directions, b) have self-reported
adequate vision (i.e., normal or corrected) to read at least 12 point font, c) not be receiving or eligible for speech and language or special education services (via self-report and teacher confirmation), and d) pass a nonword reading task (see Appendix N for the Inclusion Questionnaire).

In addition to these four inclusion criteria, the bilingual participants had to meet an ethnicity criterion and two educational criteria. Firstly, they had to be of Latino descent; that is, they must have been born in a Spanish-speaking country or have been born in the United States to parents/guardians/live-in family who were Latino and spoke Spanish. Secondly, they must have been enrolled full-time in U.S. schools since elementary school and had been exited from any English as a Second Language (ESOL) program. This information was discerned from the student language history questionnaire (see Appendix O). Previous bilingual research (e.g., Kohnert & Bates, 2002; Kohnert, Bates, & Hernandez, 1999) indicated that students who spoke English as a second language and had four to eight years of English experience in English-only educational programs, “…have sufficient language skills to enable them to participate fully in experimental tasks in English” (Windsor & Kohnert, 2004, p. 881).

Procedure

Measures

Word attack. As one of four inclusion criterion, all participants had to pass the Word Attack Subtest from the Woodcock Johnson III Test of Achievement (WJ-III ACH; Woodcock et al., 2001). This subtest measures each participant’s ability to read pseudowords that are linguistically similar to English words. For instance, the words gusp, thrept, and malfreatsun are all pseudowords presented in the Word Attack subtest.
The median reliability coefficient alphas for all age groups for the standard battery of the WJ-III ACH ranged from .81 to .94 with monolingual English speaking participants ranging from kindergarten to university students (Woodcock et al., 2001).

The rationale for using this subtest as an inclusion criterion was to exclude any participant who was unable to decode pseudowords fluently and accurately, which might indicate reading difficulties that would then influence text comprehension in a negative way. If a participant had not passed the Word Attack Subtest, then he or she would have been excluded from the study and returned to class. All participants passed this measure.

*Idiom comprehension measure.* The development of the idiom comprehension measure was described in the previous chapter, which focused on the pilot study. The methodology used to match Forms A and B (see Appendix I) is also discussed, including matching the forms based on idiom syllable length, item difficulty, and familiarity ratings. Several $t$-tests demonstrated that the forms were not significantly different from one another (see Appendix B). Results from the pilot study led to the conclusion that the idiom comprehension measure was a valid instrument.

The final Forms A and B each presented five familiar transparent idioms, five familiar opaque idioms, five unfamiliar transparent idioms, and five unfamiliar opaque idioms. Each idiom was presented in and out of context (i.e., a short story), for a total of 40 items per form. Possible selections were multiple choices in order to minimize oral language production, with three choices per idiom. Of the three answers, one was a literal but an inaccurate translation of the idiom, one was a figurative and correct translation of the idiom, and the third was figuratively related to the idiom but incorrect. To pseudo randomize the order of the items (e.g., so that all familiar, transparent idioms were not
clustered), 10 forms of each Form A and Form B were created by randomizing the items on Microsoft Excel and then analyzing to ensure that the categories were not clustered. This randomization should have prevented any order effects.

**Passage comprehension.** The Passage Comprehension Subtest from the WJ-III ACH (Woodcock et al., 2001) was administered in English in order to assess English reading comprehension. A version of this subtest was also used in a similar manner by Proctor, Carlo, August, and Snow (2005) to assess the English reading comprehension of school-age, Spanish-speaking children. The median reliability coefficient alphas for all age groups for the standard battery of the WJ-III ACH ranged from .81 to .94 with monolingual English speaking participants ranging from kindergarten to university students (Woodcock et al., 2001).

The WJ-III ACH Passage Comprehension Subtest, which is read silently, is a cloze-reading task, organized hierarchically from less to more complex passages. After reading the passage, the participant must orally “fill-in” the sentence with the appropriate lexical or syntactic choice. An analysis was conducted of the figurative language used in the WJ-III ACH Passage Comprehension Subtest. There were no instances of idiomatic language use.

**Comprehension monitoring task.** Morrison’s (2004) error detection task was modified for this study as a measure of English comprehension monitoring abilities in monolingual (English-only) and bilingual (Spanish-English) adolescents (see Appendix P). Five short stories about animals and geographic locations were chosen from an educational website (http://www.educationworld.com) and each of these stories was divided into four parts each. Each part was comprised of one to three sentences. After
each part the participant was asked explicitly whether there was an error in the sentence(s) and, if so, to underline the error. There were a total of 20 questions, four questions for each of the five stories. There were two errors per story (one micro- and one macro-error) for a total of 10 errors. The other 10 parts contained no errors.

Consistent with Morrison’s (2004) methodology, deliberate errors were inserted at the micro- and macro-levels. A micro-level error involved a graphemic error in a word such as a misspelling (e.g., layd for laid), an incorrect morphological ending (e.g., tallness for tallest), or the use of an incorrect homophone (e.g., knight for night) (Morrison, 2004). To detect a micro-level error, readers must comprehend accurately at the proposition level, as described in Kintsch’s (1998) meaning-construction phase (see Figure 2). For example, this is a sentence found in the story about deserts with a micro-level error embedded: Parts of this desert will not see a single drop of reign this year.

Kintsch’s integration phase is assessed by the reader making sense of the text as a whole, detecting any inconsistencies or errors at the macro-level when propositions are integrated. An example of a macro-level error was the violation of the internal consistency of a text by including words that contradict information found in preceding or following sentences (Morrison, 2004). For example, after the reader was told that Greece was about the size of the state of Alabama, the reader must identify the embedded macro-level error in this sentence: The United States, which is tiny when compared to Greece, has 12,300 miles of coastline.

A readability level was also calculated using the Dale-Chall New Readability Formula (Chall & Dale, 1995). This formula estimated text difficulty based on the semantic and syntactic difficulty, which together correlate \((r=.92)\) with reading
comprehension scores on cloze readings (Chall & Dale, 1995). First, two 100 word samples from the selected reading were assessed for the number of unfamiliar words using the Dale-Chall familiarity criteria. Then, the number of complete sentences was counted for each sample. Applying the formula, a seventh grade reading level was calculated for the text in the short stories, including the set of directions.

**Multiple meanings vocabulary: Synonyms.** The Reading Vocabulary Subtest from the WJ-III ACH (Woodcock et al., 2001) assesses the ability to read words and supply the words’ appropriate meanings. In the synonym task, a word similar in meaning to each written word must be selected. For example, in response to the item *haul*, any of these equivalent meanings would be synonymous: *carry, pull, drag,* or *tote.* If the response was *move, take,* or *bring,* it would be considered incorrect. The subtest was administered according to manual instructions and a raw score was obtained. Woodcock et al. (2001) reported that the median reliability coefficient alphas for all age groups for the standard battery of the WJ-III ACH ranged from .81 to .94 with monolingual English speaking participants ranging from kindergarten to university students.

**Student language history questionnaire.** All bilingual participants were interviewed by the principal investigator regarding their language histories and then completed the language history questionnaire. The questionnaire first consisted of questions related to each bilingual participant’s country of origin, age of acquisition of English and Spanish, educational background, and frequency of Spanish production and comprehension in the home environment. The remainder of the questions ($n=20$) independently answered by the participants were declarative statements followed by the
same six-point likert scale, which ranged from never (0) to always (5). For example, one question was: *I speak to my mother/guardian in Spanish.*

The purpose of the language history questionnaire (see Appendix O) was to obtain a quantitative score for each bilingual participant by tallying each participant’s likert scale responses. Total scores were on a continuum with lower scores representing less daily use of the Spanish language and higher scores representing more daily use of the Spanish language. The relationship between the scores and performance on the other measures were analyzed.

*Administration and Scoring*

All participants were assessed independently on their school campuses, during school hours. Administration of all tasks took approximately 45 minutes for each participant to complete if he/she was monolingual to one hour if he/she was bilingual. To minimize attrition, each participant attended only one testing session. Furthermore, all measures were given in English, the participants’ academic language.

After each participant met the aforementioned inclusion criteria (see Appendix N), the principal investigator gave the following directions orally:

*I am studying students at your high school to learn more about how students read.*

*I am studying reading comprehension by looking at four different tasks. We will be completing the four small tasks next. I will give you directions before we start each task. Your participation in this study is completely voluntary. If at any time you wish to stop and/or withdraw from the study, please say so. If you need a break at anytime, please let me know that as well. Thank you for taking the time to participate in this study.*
Word attack. The standardized directions found in the WJ-III ACH (Woodcock et al., 2001) manual were utilized for administration of this subtest: *I want you to read some words that are not real words. Tell me how they sound.* Following two sample items printed on a flip book, items were administered until the six highest-numbered items were failed, or until the page with the last item had been administered. There were 29 items in addition to the two sample items. If there was no response, the principal investigator encouraged a response. If there was still no response, the investigator pointed to the next word, as stated in the WJ-III ACH manual. To remain in the study, all participants obtained a grade equivalent score of at least grade 9, which meant that they all scored more than 27 points.

Idiom comprehension measure. The following directions were given orally:

*Words and phrases can have several meanings. Read these phrases and circle the answer that means the same. Some phrases will be in a short story, and some will be alone. There is only one answer for each question. If at any time you want to stop the task, you may do so without any consequences whatsoever. This is completely voluntary. If you have any questions, feel free to ask me.*

Participants completed a randomized version of either Form A or Form B. Individual assigned research numbers were written on each participant’s form in order to keep the data anonymous. The task was counterbalanced so that half of the bilinguals and half of the monolinguals completed Form A and the remaining halves completed Form B. Lastly, the presentation of Form A and Form B were counterbalanced so that the first bilingual participant received Form A, the second bilingual participant received Form B, the first monolingual participant received Form A, the second monolingual participant
received Form B, and so on. Responses were counted as correct or incorrect, and incorrect responses were judged as literal or figurative for a qualitative analysis.

**Passage comprehension.** Each participant silently read passages printed on the flip book. Only one word responses were acceptable. There was no penalty for any mispronunciations caused by dialect or regional speech patterns (Woodcock et al., 2001). In accordance with the WJ-III ACH manual (Woodcock et al., 2001), the principal investigator tested by complete pages until the six lowest-numbered items administered were correct. Testing continued until the six highest-numbered items administered were failed, or until the page with the last item had been administered. The WJ-III ACH scoring methods were used to score items as correct or incorrect such that responses were accepted as correct when they differed from the manual’s responses only in verb tense or number (singular/plural).

**Monitoring comprehension.** The following explicit written instructions were given to find all errors in the reading passage first, and then to underline these errors:

You will read five factual, short stories. Each story is about something different like an animal or a place. Your job is to look for errors in the stories. Some sentences in these stories may have errors and some may not. Some examples of errors are misspellings, incorrect verbs, and ideas that do not make sense with the rest of the story. For example, look at the errors underlined below:

To make a peanut butter and jelly sandwich you need bread, peanut butter, and jelly. You will also need a nife to spread the peanut butter and jelly, as well as to kut the cake in two. Some people also prefer the crusts to be cut off. Either way,
peanut butter and jelly sandwiches are messy, so you will not need a napkin.

Peanut butter and jelly sandwiches is very popular.

There are two misspelled words underlined: kut/cut and nife/knife. Also, there are two examples of ideas that do not go with the rest of the story. The story is about making a peanut butter and jelly sandwich, so cutting a cake does not fit with the story’s main idea. The next error is the word not. The reading first says that peanut butter and jelly sandwiches are messy, so it should say that you will need a napkin instead of saying you will not need a napkin. The last error is should say are, since sandwiches is in the plural form, meaning more than one.

Now it is your turn to find these types of errors in each of the five stories below. After reading every one or two sentences in each story you will be asked if there is an error and, if there is, to underline it. Remember that not all of the sentences will have an error.

Underlined errors that were not actual errors were not counted in terms of scores.

Multiple meanings vocabulary: Synonyms. Administration and scoring followed the manual instructions (Woodcock et al., 2001): Read each of these words out loud and tell me another word that means the same. After giving each participant the two sample questions, the remaining 26 items were administered. Testing continued until the four highest-numbered items administered were failed, or until the last test item had been administered. Only one-word responses were accepted. If a two or more word response was produced, the follow-up request was for a one-word answer. To be counted as
correct, the response must be identical to the response given in the manual, and may only differ in verb tense or number (singular/plural). Again, there was no penalty for any mispronunciations caused by dialect or regional speech patterns (Woodcock et al., 2001).

*Student language history questionnaire.* Only the bilingual participants were interviewed with the student language history questionnaire. The principal investigator completed page one in conjunction with each bilingual participant to ensure participants fit the bilingual inclusion criteria. Then, each participant completed the remainder of the questionnaire on his/her own. The following written directions were given:

Please read each statement carefully and circle the number/word that best describes your answer. If the question does not apply to you, please circle the number of the question.

Each participant’s responses were added together for a total score in order to conduct a quantitative analysis.

Participants were classified into one of two categories based on their age of acquisition of English and Spanish: a) simultaneous or b) sequential. These categories were derived from the Flege, MacKay, and Piske (2002) categories employed partly for estimating participants’ language dominance. Using this categorization procedure, any statistically significant differences within the bilingual group were explored.
Chapter Four

Results

The conceptual framework of this study is based on the global elaboration model (GEM) (Levorato et al., 2004). The GEM posits that semantic analysis is utilized to interpret unfamiliar transparent idioms but the surrounding context must be exploited to interpret unfamiliar opaque idioms. Young children rely heavily on semantic analysis (local coherence) to comprehend unknown idioms, whether transparent or opaque. They gradually develop the ability to make inferences and create global coherence by exploiting the surrounding context. Idiom comprehension, linguistic development, and reading comprehension appear to develop in tandem (Cain et al., 2005; Levorato et al., 2007). Thus, the speculation was that more-skilled readers/comprehenders would be more adept than less-skilled readers/comprehenders at creating the global coherence that results in accurate idiomatic interpretations.

Major Aims

Three major aims guided the investigation of the psychological reality of the GEM for a bilingual and monolingual adolescent population. The first aim related to the model illustrated in Figure 3. This model incorporated three underlying principles: (a) inferencing from the micro- to macro- level; b) monitoring of comprehension; and c) choosing appropriate constituent meanings from various possible meanings. The predictive value of these three principles for accurate idiom comprehension was tested.
The three principles were operationalized as a) a reading comprehension task, b) an error detection task, and c) a synonym task to predict performance on the idiom comprehension measure.

The second aim focused on the interactions among language group (bilinguals and monolinguals) and performance on the idiom comprehension measure as a result of varying idiomatic familiarity, semantic transparency, and contextual support. The third aim was to investigate group differences within the bilingual group. The results related to each of the three aims are presented sequentially followed by a summary of main findings.

Testing the Model: Aim 1

The first aim of the study was to determine the extent to which each of the three variables (a reading comprehension task, an error detection task, and a synonym task) predicted the criterion variable, idiom comprehension accuracy. It was hypothesized that the performance on the three measures would predict the performance on the fourth measure, idiom comprehension, for both the bilingual and monolingual groups.

Collapsing across groups: Simultaneous multiple regression. The first aim was to investigate the overall predictive power of each measure for idiom comprehension accuracy. To address the first aim directly, the language groups were collapsed and then a multiple regression was conducted utilizing the scores on the reading comprehension, error detection, and synonym tasks as predictors for the scores on the fourth task (idiom comprehension). This multiple regression used the simultaneous method where all three predictor variables were weighted equally and entered into a single model, simultaneously. The result was a statistically significant fit, $F(3, 61) = 11.169$, $MS =$
The Adjusted R Square for this model was .333, meaning that the model accounted for approximately 33% of the variance in the idiom comprehension scores. All four tasks were correlated with values ranging from 0.427 to 0.533. These Pearson Correlations are presented in Table 4.1. Significant variables are displayed in Table 4.2. Beta values “… represent the change in the outcome resulting from a unit change in the predictor” (Field, 2000, p. 114). The beta value of the error detection task (β= 0.351*) was statistically significant, indicating that this predictor variable had the greatest impact on the criterion variable (the idiom comprehension scores). Furthermore, the positive beta value demonstrated a positive relationship between the error detection task and the idiom comprehension measure.

Table 4.1
Means, Standard Deviations, and Intercorrelations for Participants’ (N = 62) Idiom Comprehension and Predictor Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
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<th>2</th>
<th>3</th>
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<tbody>
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<td>Idiom comprehension measure</td>
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<td>2.83</td>
<td>.427*</td>
<td>.490*</td>
<td>.533*</td>
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<tr>
<td>Predictor variable</td>
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<td></td>
</tr>
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<td>1. Synonym Task</td>
<td>15.79</td>
<td>2.27</td>
<td>--</td>
<td>.532*</td>
<td>.410*</td>
</tr>
<tr>
<td>2. Reading Comprehension Task</td>
<td>36.55</td>
<td>3.26</td>
<td>--</td>
<td>--</td>
<td>.514*</td>
</tr>
<tr>
<td>3. Error Detection Task</td>
<td>7.90</td>
<td>2.23</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

*p <.01
Table 4.2

Simultaneous Regression Analysis Summary for Three Variables Predicting Idiom Comprehension

<table>
<thead>
<tr>
<th>Variable</th>
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<th>SEB</th>
<th>ß</th>
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</thead>
<tbody>
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<td>Synonym Task</td>
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<td>.157</td>
<td>.166</td>
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<tr>
<td>Reading Comprehension Task</td>
<td>.192</td>
<td>.116</td>
<td>.221</td>
</tr>
<tr>
<td>Error Detection Task</td>
<td>.445</td>
<td>.157</td>
<td>.351*</td>
</tr>
</tbody>
</table>

*Note. $R^2 = .366$ ($N = 62$, $p < .01$).

Contribution of language group variance: Simultaneous multiple regression. A multiple regression was then conducted using group as a fourth predictor of idiom comprehension. The purpose was to investigate the predictive power of language group membership on idiom comprehension performance. Using the simultaneous method, a statistically significant model $F(4, 57) = 8.236$, $MS = 44.636$, $p < .05$ emerged. The Adjusted R Square for this model was .322; that is, the model accounted for approximately 32% of the variance in the idiom comprehension scores. Moreover, when compared to the previous three predictor analysis (Adjusted R Square = 33%), the amount of variance did not appear to change when group was added as the fourth predictor. Group was negatively correlated with all other variables, with values ranging from -0.299 to -0.494. Since the group variable was binary (1 = monolinguals, 2 = bilinguals) and previous analyses had shown that monolinguals performed significantly better on each of these four measures than did the bilinguals, this strong, negative correlation may indicate that, as group membership approached 1.0 (1.0 represented
monolingual membership), the scores increased. The Pearson Correlations are presented in Table 4.3 and significant variables are displayed in Table 4.4. The error detection task had a significant beta (β = .348*). This indicated that the error detection variable still had the greatest impact on idiom comprehension performance, even with language group added as the fourth variable.

Table 4.3

Means, Standard Deviations, and Intercorrelations for Participants’ Idiom Comprehension and Predictor Variables Including Language Group

<table>
<thead>
<tr>
<th>Variable</th>
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<th>3</th>
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<td>Idiom comprehension measure</td>
<td>33.48</td>
<td>2.83</td>
<td>-.299*</td>
<td>.427*</td>
<td>.490*</td>
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<td>Predictor variable</td>
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<td>1. Group</td>
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<td>.50</td>
<td>--</td>
<td>-.494*</td>
<td>-.319*</td>
<td>-.394*</td>
</tr>
<tr>
<td>2. Synonym Task</td>
<td>15.79</td>
<td>2.27</td>
<td>--</td>
<td>.532*</td>
<td>.410*</td>
<td></td>
</tr>
<tr>
<td>3. Reading Comprehension Task</td>
<td>36.55</td>
<td>3.26</td>
<td>--</td>
<td></td>
<td>.514*</td>
<td></td>
</tr>
<tr>
<td>4. Error Detection Task</td>
<td>7.90</td>
<td>2.23</td>
<td></td>
<td></td>
<td></td>
<td>--</td>
</tr>
</tbody>
</table>

*p < .01

Table 4.4

Simultaneous Regression Analysis Summary for Four Variables Predicting Idiom Comprehension

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SEB</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td>-.066</td>
<td>.701</td>
<td>-.012</td>
</tr>
<tr>
<td>Synonym Task</td>
<td>.201</td>
<td>.170</td>
<td>.161</td>
</tr>
<tr>
<td>Reading Comprehension Task</td>
<td>.192</td>
<td>.117</td>
<td>.221</td>
</tr>
</tbody>
</table>
(Table 4.4 continued)

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Language Group</td>
<td>1.50</td>
<td>.50</td>
<td>-.494*</td>
<td>-.319*</td>
<td>-.394*</td>
<td>-.299*</td>
</tr>
</tbody>
</table>

Error Detection Task  .441  .163  .348*

Note. $R^2 = .366$ ($N = 62$, $p < .01$).

*p < .01

Language group as criterion variable: Simultaneous multiple regression. An additional multiple regression was then performed which treated language group as the criterion variable and the other four variables (idiom comprehension, error detection, passage comprehension, and the synonym task) as the four predictor variables. This analysis allowed examination of whether the four tasks could predict language group membership (monolingual or bilingual).

A simultaneous multiple regression demonstrated that the model was significant, $F(4, 57) = 5.777$, $MS = 1.118$, $p < .05$. The Adjusted R Square for this model was .239. These four predictors accounted for approximately 24% of the variance in the criterion variable (language group). The Pearson Correlations are presented in Table 4.5. Significant variables are displayed in Table 4.6. The synonym task had a significant beta value ($\beta = -.405*$), which implied that this task had the greatest impact on the criterion variable (language group membership). Appendix Q displays synonym item accuracy for the bilingual and monolingual language groups.

Table 4.5
Means, Standard Deviations, and Intercorrelations for Participants’ Language Group and Predictor Variables Including Idiom Comprehension
(Table 4.5 continued)

Predictor variable

1. Synonym Task  
   Predictor 15.79  2.27  --  .532*  .410*  .427*

2. Reading Comprehension Task  
   Predictor 36.55  3.26  --  .514*  .490*

3. Error Detection Task  
   Predictor 7.90  2.23  --  .533*

4. Idiom comprehension measure  
   Predictor 33.48  2.83  --

*\(p < .01\)

Table 4.6

Simultaneous Regression Analysis Summary for Four Variables Predicting Language Group

<table>
<thead>
<tr>
<th>Variable</th>
<th>(B)</th>
<th>SEB</th>
<th>(\beta)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synonym Task</td>
<td>-.090</td>
<td>.030</td>
<td>-.405*</td>
</tr>
<tr>
<td>Reading Comprehension Task</td>
<td>.003</td>
<td>.023</td>
<td>.022</td>
</tr>
<tr>
<td>Error Detection Task</td>
<td>-.052</td>
<td>.032</td>
<td>-.232</td>
</tr>
<tr>
<td>Idiom Comprehension Task</td>
<td>-.002</td>
<td>.025</td>
<td>-.013</td>
</tr>
</tbody>
</table>

*Note. \(R^2 = .288\) (\(N = 62, p < .01\)).

*Bilinguals only: Simultaneous multiple regression.* Lastly, two final simultaneous multiple regressions were conducted by analyzing each language group separately in order to determine if there were different significant variables predicting idiom comprehension accuracy. First, the data from the bilingual language group were entered into a simultaneous multiple regression that treated idiom comprehension as the criterion variable and the other three linguistic variables (error detection, passage comprehension,
and the synonym task) as the predictor variables. This analysis allowed examination of whether the three tasks could predict idiom comprehension accuracy for the bilinguals.

A simultaneous multiple regression demonstrated that the model was significant, $F(3, 30) = 4.749$, $MS = 35.356$, $p < .01$. The Adjusted R Square for this model was .273. These three predictors accounted for approximately 27% of the variance in the criterion variable (idiom comprehension accuracy). The Pearson Correlations are presented in Table 4.7. Significant variables are displayed in Table 4.8. There were no significant beta values and all variables were positively correlated. In contrast with the other linguistic variables, the synonym task was not significantly correlated with the other linguistic variables aside from the idiom comprehension measure.

Table 4.7
Means, Standard Deviations, and Intercorrelations for Bilingual Participants’ Idiom Comprehension Accuracy and Three Linguistic Predictor Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idiom Comprehension</td>
<td>32.65</td>
<td>3.19</td>
<td>.265*</td>
<td>.528*</td>
<td>.487*</td>
</tr>
<tr>
<td>Predictor variable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Synonym Task</td>
<td>14.68</td>
<td>1.90</td>
<td>--</td>
<td>.288</td>
<td>.255</td>
</tr>
<tr>
<td>2. Reading Comprehension Task</td>
<td>35.52</td>
<td>3.05</td>
<td>--</td>
<td>--</td>
<td>.534*</td>
</tr>
<tr>
<td>3. Error Detection Task</td>
<td>7.03</td>
<td>2.359</td>
<td>--</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < .01
Table 4.8

Simultaneous Regression Analysis Summary for Three Variables Predicting Bilinguals’ Idiom Comprehension Accuracy

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SEB</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synonym Task</td>
<td>.157</td>
<td>.275</td>
<td>.093</td>
</tr>
<tr>
<td>Reading Comprehension Task</td>
<td>.371</td>
<td>.196</td>
<td>.354</td>
</tr>
<tr>
<td>Error Detection Task</td>
<td>.372</td>
<td>.252</td>
<td>.274</td>
</tr>
</tbody>
</table>

Note. $R^2 = .345$ ($N = 31, p < .01$).

* $p < .01$

Monolinguals only: Simultaneous multiple regression. The final simultaneous multiple regression analyzed only the data from the monolingual language group. Their data were entered into a simultaneous multiple regression which treated idiom comprehension as the criterion variable and the other three linguistic variables (error detection, passage comprehension, and the synonym task) as the predictor variables. This analysis allowed examination of whether the three tasks could predict idiom comprehension accuracy for the monolinguals.

A simultaneous multiple regression demonstrated that the model was significant, $F(3, 30) = 4.135$, $MS = 14.352$, $p < .05$. The Adjusted R Square for this model was .239. These three predictors accounted for approximately 24% of the variance in the criterion variable (idiom comprehension accuracy). The Pearson Correlations are presented in Table 4.9. Significant variables are displayed in Table 4.10. As with the bilingual-only analysis, there were no significant beta values. Unlike the bilingual-only analysis, though,
all variables were positively and significantly correlated with the other linguistic variables, including the synonym task.

Table 4.9

Means, Standard Deviations, and Intercorrelations for Monolingual Participants’ Idiom Comprehension Accuracy and Three Linguistic Predictor Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idiom Comprehension</td>
<td>34.32</td>
<td>2.14</td>
<td>.460**</td>
<td>.330*</td>
<td>.445*</td>
</tr>
<tr>
<td>Predictor variable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Synonym Task</td>
<td>16.90</td>
<td>2.071</td>
<td>--</td>
<td>.601**</td>
<td>.301*</td>
</tr>
<tr>
<td>2. Reading Comprehension Task</td>
<td>37.58</td>
<td>3.18</td>
<td>--</td>
<td></td>
<td>.346*</td>
</tr>
<tr>
<td>3. Error Detection Task</td>
<td>8.77</td>
<td>1.726</td>
<td>--</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < .05

**p < .01

Table 4.10

Simultaneous Regression Analysis Summary for Three Variables Predicting Monolinguals’ Idiom Comprehension Accuracy

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SEB</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synonym Task</td>
<td>.371</td>
<td>.207</td>
<td>.360</td>
</tr>
<tr>
<td>Reading Comprehension Task</td>
<td>-.002</td>
<td>.137</td>
<td>-.003</td>
</tr>
<tr>
<td>Error Detection Task</td>
<td>.418</td>
<td>.212</td>
<td>.338</td>
</tr>
</tbody>
</table>

Note. $R^2 = .315 (N = 31, p < .01).$

*p < .01
Summary: Aim 1 findings. It was evident from the exploration of Aim 1 that the idiom comprehension measure was significantly correlated with the other three measures (r = .427 - .533), and that the three measures were also significantly correlated with each other (r = .410 - .532). The model tested in this first aim indicated that the three principles (operationalized through a reading comprehension task, synonym task, and error detection task) predicted about 33% of the variance in idiom comprehension scores. The variable making the most impact, the error detection task (β = .351*), was illuminated. Furthermore, the synonym task was the greatest predictor of language group membership. In addition, language group membership did not predict idiom comprehension performance, and idiom comprehension performance did not predict language group membership. Lastly, more variance was accounted for on the three linguistic measures when the two language groups were collapsed.

Cross-Language Group Performance on Idiomatic Comprehension: Aim 2

Before addressing the second aim, which analyzed the outcomes of the idiom comprehension measure, an item analysis was conducted using the Cronbach Alpha to measure the reliability of the idiom comprehension measure. Cronbach Alpha measures reliability in terms of the ratio of true score variance to observed score variance (Yu, 2007). First, the mean output presented in Table 4.11 demonstrates how difficult the items were. Since the items in this analysis were considered either correct or incorrect, the means ranged from 0 to 1. A mean score of 1.0 indicated that all participants received a correct score for the item, suggesting that the item was easier. The mean scores for the idiom comprehension measure ranged from 0.452 (item #35, *To whistle in your thumb*) to 1.000 (item #16, *At the drop of a hat*).
Secondly, the item correlation is a raw score. The more strongly the items were
interrelated, the higher the consistency of the test items (Yu, 2007). The Cronbach Alpha
was .965, indicating strong internal consistency among the test items on the idiom
comprehension measure, which is one type of reliability. Moreover, due to the high inter-
item correlation, the idiom comprehension measure appeared to be reliable.

Table 4.11
Means and Standard Deviations for the 40 Items on the Idiom Comprehension Measure

<table>
<thead>
<tr>
<th>Item</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Hold your head up</td>
<td>0.984</td>
<td>0.127</td>
</tr>
<tr>
<td>2. Go by the book</td>
<td>0.984</td>
<td>0.127</td>
</tr>
<tr>
<td>3. Take someone under your wing</td>
<td>0.984</td>
<td>0.127</td>
</tr>
<tr>
<td>4. Blow off steam</td>
<td>0.952</td>
<td>0.216</td>
</tr>
<tr>
<td>5. Keep a straight face</td>
<td>0.984</td>
<td>0.127</td>
</tr>
<tr>
<td>6. Right under my nose</td>
<td>0.984</td>
<td>0.127</td>
</tr>
<tr>
<td>7. Cry over spilled milk</td>
<td>0.984</td>
<td>0.127</td>
</tr>
<tr>
<td>8. Hold your tongue</td>
<td>0.919</td>
<td>0.275</td>
</tr>
<tr>
<td>9. Take a shot in the dark</td>
<td>0.968</td>
<td>0.178</td>
</tr>
<tr>
<td>10. The early bird catches the worm</td>
<td>0.952</td>
<td>0.216</td>
</tr>
<tr>
<td>11. Bring the house down</td>
<td>0.968</td>
<td>0.178</td>
</tr>
<tr>
<td>12. Paint the town red</td>
<td>0.903</td>
<td>0.298</td>
</tr>
<tr>
<td>13. Have a soft spot in your heart</td>
<td>0.790</td>
<td>0.410</td>
</tr>
<tr>
<td>14. Chip off the old block</td>
<td>0.968</td>
<td>0.178</td>
</tr>
<tr>
<td>15. Spill the beans</td>
<td>0.968</td>
<td>0.178</td>
</tr>
</tbody>
</table>
(Table 4.11 continued)

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>16. At the drop of a hat</td>
<td>1.000</td>
<td>0.000</td>
</tr>
<tr>
<td>17. Wet behind the ears</td>
<td>0.887</td>
<td>0.319</td>
</tr>
<tr>
<td>18. Jump through hoops</td>
<td>0.919</td>
<td>0.275</td>
</tr>
<tr>
<td>19. Go cold turkey</td>
<td>0.919</td>
<td>0.275</td>
</tr>
<tr>
<td>20. To flip your lid</td>
<td>0.871</td>
<td>0.338</td>
</tr>
<tr>
<td>21. To run around like scalded pigs</td>
<td>0.871</td>
<td>0.338</td>
</tr>
<tr>
<td>22. For a good hunger there is no hard bread</td>
<td>0.919</td>
<td>0.275</td>
</tr>
<tr>
<td>23. To shoot sparrows with cannons</td>
<td>0.952</td>
<td>0.216</td>
</tr>
<tr>
<td>24. To try to make a hole in water</td>
<td>0.823</td>
<td>0.385</td>
</tr>
<tr>
<td>25. To hold someone’s leg</td>
<td>0.952</td>
<td>0.216</td>
</tr>
<tr>
<td>26. To fall down with four horseshoes in the air</td>
<td>0.774</td>
<td>0.422</td>
</tr>
<tr>
<td>27. To cut a pear in two</td>
<td>0.645</td>
<td>0.482</td>
</tr>
<tr>
<td>28. To throw flowers to somebody</td>
<td>0.758</td>
<td>0.432</td>
</tr>
<tr>
<td>29. To put on the sails</td>
<td>0.984</td>
<td>0.127</td>
</tr>
<tr>
<td>30. To be a monkey on a branch</td>
<td>0.935</td>
<td>0.248</td>
</tr>
<tr>
<td>31. To eat the leaf</td>
<td>0.839</td>
<td>0.371</td>
</tr>
<tr>
<td>32. To pet the horse first</td>
<td>0.855</td>
<td>0.355</td>
</tr>
<tr>
<td>33. To be at the green</td>
<td>0.774</td>
<td>0.422</td>
</tr>
<tr>
<td>34. To have salt in your pumpkin</td>
<td>0.597</td>
<td>0.495</td>
</tr>
<tr>
<td>35. To whistle in your thumb</td>
<td>0.452</td>
<td>0.502</td>
</tr>
<tr>
<td>36. To pick up a log</td>
<td>0.468</td>
<td>0.503</td>
</tr>
<tr>
<td>37. To eat on the thumb</td>
<td>0.468</td>
<td>0.503</td>
</tr>
</tbody>
</table>
Addressing aim 2. The second aim of the study was to determine whether there were differences in performance outcomes on the idiom comprehension measure between the bilingual and monolingual language groups. Specifically, the research question posed was how the performance outcomes of the bilingual adolescents would differ from the performance outcomes of the control group (monolingual, English-speaking adolescents) on familiarity, semantic transparency, and context. It was predicted that there would be an interaction among familiarity, semantic transparency, context, and language group. A four-way, repeated measures, mixed ANOVA with one between-subject variable (language group) and three within-subject variables (familiarity, semantic transparency, and context, each with two levels) was conducted in order to answer this question. Table 4.12 summarizes the ANOVA results.

Table 4.12

ANOVA Results for the Accuracy Scores on the Idiom Comprehension Measure

<table>
<thead>
<tr>
<th>Variable/Source</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
<th>partial $\eta^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>(1, 60)</td>
<td>128.032</td>
<td>329.606</td>
<td>&lt;.001*</td>
<td>0.846</td>
</tr>
<tr>
<td>F x G</td>
<td>(1, 60)</td>
<td>1.161</td>
<td>2.990</td>
<td>0.089</td>
<td>0.047</td>
</tr>
<tr>
<td>T</td>
<td>(1, 60)</td>
<td>72.782</td>
<td>253.274</td>
<td>&lt;.001*</td>
<td>0.808</td>
</tr>
<tr>
<td>T x G</td>
<td>(1, 60)</td>
<td>0.976</td>
<td>3.396</td>
<td>0.070</td>
<td>0.054</td>
</tr>
<tr>
<td>C</td>
<td>(1, 60)</td>
<td>134.202</td>
<td>441.796</td>
<td>&lt;.001*</td>
<td>0.880</td>
</tr>
</tbody>
</table>
(Table 4.12 continued)

<table>
<thead>
<tr>
<th>Interaction</th>
<th>df</th>
<th>F</th>
<th>p</th>
<th>p*</th>
</tr>
</thead>
<tbody>
<tr>
<td>C x G</td>
<td>1, 60</td>
<td>0.073</td>
<td>0.239</td>
<td>0.627</td>
</tr>
<tr>
<td>F x T</td>
<td>1, 60</td>
<td>28.073</td>
<td>72.926</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>F x C</td>
<td>1, 60</td>
<td>72.782</td>
<td>218.171</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>T x C</td>
<td>1, 60</td>
<td>39.516</td>
<td>104.478</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>F x T x C</td>
<td>1, 60</td>
<td>21.806</td>
<td>39.455</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>F x T x G</td>
<td>1, 60</td>
<td>2.331</td>
<td>6.054</td>
<td>0.017*</td>
</tr>
<tr>
<td>F x C x G</td>
<td>1, 60</td>
<td>0.202</td>
<td>0.604</td>
<td>0.440</td>
</tr>
<tr>
<td>T x C x G</td>
<td>1, 60</td>
<td>0.290</td>
<td>0.768</td>
<td>0.384</td>
</tr>
<tr>
<td>F x T x C x G</td>
<td>1, 60</td>
<td>0.032</td>
<td>0.058</td>
<td>0.810</td>
</tr>
</tbody>
</table>

*Statistically Significant

Note. The abbreviations signify the following idiomatic conditions: F = familiarity, T = semantic transparency, C = context, and G = group.

Interactions. The overall mean difference of the language groups was significant at the .05 level (mean difference = .210, CI = .037 - .382), which indicated a large amount of score overlap. However, there was not a four-way interaction that reached statistical significance; that is, language group did not contribute to any statistically significant differences beyond chance levels once the eight combinations of idiomatic conditions were considered (familiarity: familiar and unfamiliar, semantic transparency: transparent and opaque, and context: in and out). Table 4.13 displays the descriptive data for the accuracy scores for the eight combinations of idiomatic conditions as a function of language group. Although language group membership did not prove to be statistically significant, the descriptive data showed that, overall, monolingual participants performed
slightly better than bilingual participants in all idiomatic conditions except for the unfamiliar, opaque condition both in- and out-of-context.

Table 4.13

Idiom Comprehension Scores for Monolinguals and Bilinguals in the Eight Conditions

<table>
<thead>
<tr>
<th>Idiomatic Condition</th>
<th>Monolinguals</th>
<th>Bilinguals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>FTI</td>
<td>4.97</td>
<td>.18</td>
</tr>
<tr>
<td>FTO</td>
<td>4.97</td>
<td>.18</td>
</tr>
<tr>
<td>FOI</td>
<td>4.94</td>
<td>.25</td>
</tr>
<tr>
<td>FOO</td>
<td>4.52</td>
<td>.72</td>
</tr>
<tr>
<td>UTI</td>
<td>4.87</td>
<td>.43</td>
</tr>
<tr>
<td>UTO</td>
<td>4.06</td>
<td>.85</td>
</tr>
<tr>
<td>UOI</td>
<td>4.42</td>
<td>.77</td>
</tr>
<tr>
<td>UOO</td>
<td>1.58</td>
<td>.81</td>
</tr>
</tbody>
</table>

Note. The abbreviations used signify the following idiomatic conditions: FTI is familiar, transparent, in-context; FTO is familiar, transparent, out-of-context; FOI is familiar, opaque, in-context; FOO is familiar, opaque, out-of-context; UTI is unfamiliar, transparent, in-context; UTO is unfamiliar, transparent, out-of-context; UOI is unfamiliar, opaque, in-context; and UOO is unfamiliar, opaque, out-of-context.

There was one statistically significant three-way interaction among familiarity, transparency, and context, $F(1, 60) = 39.455$, MS = 21.806, $p<0.001$, partial $\eta^2 = .397$ with an observed power of 1.00 (see Figure 10). An additional three-way interaction emerged among group, familiarity, and transparency, $F(1, 60) = 6.054$, MS = 2.331, $p =$
0.017, partial $\eta^2 = .092$ with an observed power of .678. This interaction was the only interaction where group was significant.

![Graph](image.png)

**Figure 10.** The statistically significant three-way interaction among accuracy scores in the eight combinations of idiomatic conditions: familiarity, transparency, and context, with language groups collapsed.

*Note.* The abbreviations used signify the following idiomatic conditions: FTI is familiar, transparent, in-context; FTO is familiar, transparent, out-of-context; FOI is familiar, opaque, in-context; FOO is familiar, opaque, out-of-context; UTI is unfamiliar, transparent, in-context; UTO is unfamiliar, transparent, out-of-context; UOI is unfamiliar, opaque, in-context; and UOO is unfamiliar, opaque, out-of-context.

Post hoc testing using the Bonferroni procedure demonstrated that all participants performed significantly differently when idioms were familiar or unfamiliar, when idioms were transparent or opaque, and when idioms were presented in and out of context. For instance, overall performance was best in the familiar/transparent/in-context condition ($M = 4.903$, CI = 4.815 – 4.991), and performance was worse under the unfamiliar/opaque/out-of-context condition ($M = 1.661$, CI = 1.440 -1.882). Furthermore, participants always performed better with contextual support rather than without the
support of context; however, performance decreased more with opaque idioms (even in context) and when idioms were unfamiliar (See Table 4.13). In addition, in terms of the significant three way interaction among group, familiarity, and transparency, pairwise comparisons demonstrated that the monolinguals performed significantly better than the bilinguals in all combinations of familiarity and transparency, except for the unfamiliar, opaque idioms, where bilinguals outperformed the monolinguals, although results did not reach statistical significance.

There were also three statistically significant two-way interactions among the idiomatic variables. First, there was a significant interaction between familiarity and transparency, $F(1, 60) = 72.926, MS = 28.073, p<0.001$, and partial $\eta^2 = .549$ with an observed power of 1.00. Pairwise comparisons indicated that participants scored best on familiar, transparent idioms ($M = 4.839, CI = 4.766 – 4.911$). Their scores then progressively declined with the pattern of: familiar/opaque ($M = 4.548, CI = 4.414 – 4.683$), to unfamiliar/transparent ($M = 4.298, CI = 4.154 – 4.443$), to unfamiliar/opaque idioms ($M = 3.056, CI = 2.916 – 3.197$).

Secondly, there was a significant two-way interaction between familiarity and context, $F(1, 60) = 72.782, MS = 218.171, p<0.001$, and partial $\eta^2 = .784$ with an observed power of 1.00. Pairwise comparisons revealed a slightly different pattern in that performance was best in the familiar/in-context condition ($M = 4.831, CI = 4.724 – 4.937$) and then scores began to decline with the unfamiliar/in-context ($M = 4.581, CI = 4.442 – 4.719$) condition, followed by the familiar/out-of-context ($M = 4.556, CI = 4.441 – 4.672$), and the unfamiliar/out-of-context ($M = 2.774, CI = 2.636 – 2.912$) conditions.
Lastly, there was a significant two-way interaction between transparency and context, $F(1, 60) = 104.478$, $MS = 39.516$, $p<0.001$, and partial $\eta^2 = .635^1$ with an observed power of 1.00. Pairwise comparisons again confirmed that performance was best in the transparent/in-context condition ($M = 4.806$, CI = 4.709 – 4.904). However, in terms of mean differences, the participants then did better with opaque idioms that were in-context ($M = 4.605$, CI = 4.483 – 4.726) than with transparent idioms out-of-context ($M = 4.331$, CI = 4.202 – 4.459). Contextual support appeared to assist in accurate idiomatic comprehension. Similar to all other post hoc tests, mean scores declined when participants faced opaque idioms that were out-of-context ($M = 3.000$, CI = 2.858 – 3.142).

**Main effects.** There were also three statistically significant main effects for each idiomatic variable. A main effect was found for the familiarity variable, $F(1, 60) = 329.606$, $MS = 128.032$, $p<0.001$, and partial $\eta^2 = .846^1$ with an observed power of 1.00. Participants comprehended idioms more accurately when they were familiar ($M = 4.694$, CI = 4.600 – 4.787) rather than unfamiliar ($M = 3.677$, CI = 3.566 – 3.789). Likewise, a main effect was found for the transparency variable, $F(1, 60) = 253.274$, $MS = 72.782$, $p<0.001$, and partial $\eta^2 = .808^1$ with an observed power of 1.00. Again performance was better when idioms were semantically transparent ($M = 4.569$, CI = 4.476 – 4.661) rather than semantically opaque ($M = 3.802$, CI = 3.698 – 3.907). Lastly, there was also a main effect for the context variable, $F(1, 60) = 441.796$, $MS = 134.202$, $p<0.001$, and partial $\eta^2 = .880^1$ with an observed power of 1.00. Contextual support assisted participants’ comprehension ($M = 4.706$, CI = 4.610 – 4.801) more so than no contextual support ($M = 3.665$, CI = 3.562 – 3.768).
Results of additional hypotheses. There were four additional hypotheses associated with the second aim. Firstly, it was hypothesized that both monolinguals and bilinguals would perform less well on unfamiliar, opaque idioms. This hypothesis was partially supported in that, when comparing mean differences, both the monolinguals ($M = 1.58, SD = .81$) and the bilinguals ($M = 1.74, SD = .93$) performed less well in this condition, but only when the unfamiliar/opaque idioms were out-of-context. Performance on in-context, unfamiliar/opaque idioms was better (monolinguals: $M = 4.42, SD = .77$, bilinguals: $M = 4.48, SD = .72$).

Secondly, it was hypothesized that monolinguals would perform better than the bilinguals on familiar idioms based on the language experience hypothesis. This hypothesis was supported in terms of mean differences since the monolinguals performed better on the familiar idioms ($M = 19.39, SD = 0.92$) than did the bilinguals ($M = 18.16, SD = 1.86$), regardless of whether the idioms were transparent or opaque, or in- or out-of-context. An independent t-test confirmed these descriptive data, $t (60) = 3.284, p < .01, d = 0.84$, an effect size that indicated that the magnitude of difference between the means of the two language groups was a large one. Interestingly, the bilinguals did perform better than the monolinguals on both the unfamiliar/opaque/in-context and unfamiliar/opaque/out-of-context idioms (See Table 4.13).

Thirdly, it was predicted that all participants would perform better when given contextual support; however, context would benefit “less-skilled” reading comprehenders less. This hypothesis was analyzed by first transforming the continuous scores on the reading comprehension test into categorical scores. Based on the scoring table of the Woodcock Passage Comprehension subtest (WJ-III ACH; Woodcock et al., 2001), scores
were converted into Grade Equivalent Estimates. For example, a score of 36 on the subtest equals a grade equivalent score of 10.1. These grade equivalent scores were then compared to the participants’ actual grade levels at the time of testing. If a participant scored exactly at grade level or below, they were considered “less-skilled comprehenders.” Those with scores at grade level (e.g., 9.0 in grade 9) were considered “less-skilled comprehenders” since the study was conducted after January of the school year; therefore, to score on grade level, the participants needed a score slightly above their current grade level (such as 9.2 if they were in grade 9). All scores above grade level (grade .2 and above) were considered as indicating “skilled comprehenders.” Using this procedure, a total of 19 monolinguals and 13 bilinguals were categorized as “skilled comprehenders,” and 12 monolinguals and 18 bilinguals were categorized as “less-skilled comprehenders.” In sum, there were 32 “skilled comprehenders” and 30 “less-skilled comprehenders.”

Descriptive data were also calculated for these two groups. The “skilled comprehenders” had a mean score of 39.13 ($SD = 1.88$) and the “less-skilled comprehenders” had a mean score of 33.80 ($SD = 1.80$). Moreover, a statistically significant difference, $t (60) = 11.388, p < .01$, existed between the two reading groups.

Next, total scores on unfamiliar idioms (transparent and opaque), in–context were calculated. Because of the language experience hypothesis, familiar idioms were not included in this analysis. Also, because this analysis was measuring the potential common denominator of inferencing ability, only idioms in–context were included. An independent t-test was conducted where equal variances were not assumed (due to the Levene’s Test for Equality of Variances). A statistically significant difference between
the scores of the “skilled” ($M = 9.34, SD = .83$) and “less-skilled” ($M = 8.90, SD = 1.30$) comprehension groups on unfamiliar idioms in - context was not found (see Appendix B for all non-significant $t$-test results). Thus, the null hypothesis could not be rejected.

The fourth and final hypothesis connected with Aim 2 predicted that those participants with poorer reading comprehension scores would choose more literal responses. Incorrect responses were categorized as figurative or literal in nature (see Table 4.14). The literal errors were tallied. Then, an independent $t$-test was calculated (equal variances were assumed according to the Levene’s test) using the number of literal errors and again, a significant difference between the “less-skilled comprehenders” ($M = 2.07, SD = 2.36$) and the “skilled comprehenders” ($M = 1.53, SD = 1.44$) did not emerge (see Appendix B). The null hypothesis could not be rejected. However, when an ANOVA was conducted, which included both figurative and literal errors, there was a significant difference between the reading groups in terms of the number of figurative errors, $F(1, 60) = 6.442, MS = 26.502, p<0.014$, and partial $\eta^2 = .097$ with an observed power of 0.704, with the “less-skilled comprehenders” making significantly more figurative errors.

Table 4.14
Error Analysis of All Items on the Idiom Comprehension Measure by Language Group (Monolingual (M), Bilingual (B)) and Error Type

<table>
<thead>
<tr>
<th>Condition</th>
<th>M Literal Errors</th>
<th>B Literal Errors</th>
<th>M Figurative Errors</th>
<th>B Figurative Errors</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>FTI</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>FTO</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td>FOI</td>
<td>1</td>
<td>5</td>
<td>1</td>
<td>8</td>
<td>15</td>
</tr>
<tr>
<td>FOO</td>
<td>1</td>
<td>8</td>
<td>13</td>
<td>18</td>
<td>40</td>
</tr>
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</table>
(Table 4.14 continued)

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>4</th>
<th>13</th>
<th>18</th>
</tr>
</thead>
<tbody>
<tr>
<td>UTI</td>
<td>5</td>
<td>11</td>
<td>24</td>
<td>29</td>
<td>69</td>
</tr>
<tr>
<td>UTO</td>
<td>6</td>
<td>6</td>
<td>12</td>
<td>10</td>
<td>34</td>
</tr>
<tr>
<td>UOI</td>
<td>80</td>
<td>70</td>
<td>207</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note1. The abbreviations used signify the following idiomatic conditions: FTI is familiar, transparent, in-context; FTO is familiar, transparent, out-of-context; FOI is familiar, opaque, in-context; FOO is familiar, opaque, out-of-context; UTI is unfamiliar, transparent, in-context; UTO is unfamiliar, transparent, out-of-context; UOI is unfamiliar, opaque, in-context; and UOO is unfamiliar, opaque, out-of-context.

Note2. Highlighted portion indicates the only conditions in which the bilinguals scores were higher than the monolingual scores.

In addition, in terms of the error analysis, there were more figurative errors \( N = 294 \) than literal errors \( N = 109 \) for both groups combined. The bilingual group not only made more literal errors \( N = 69 \) than did the monolingual group \( N = 40 \); but also more figurative errors \( N = 159 \) than did the monolingual group \( N = 135 \). However, an ANOVA demonstrated that these differences in language groups were not significant for either the literal responses or the figurative error responses (see Appendix R for non-significant ANOVA results).

Summary: Aim 2 findings. A Cronbach Alpha \( \alpha = .965 \) demonstrated high internal consistency of the items on the idiom comprehension measure. In terms of group differences in performance on this measure, the monolinguals performed better than the bilinguals on the idiom comprehension measure when total scores were considered. However, there was not a statistically significant four-way interaction among group, familiarity, transparency, and context. Instead, there was a significant three-way
interaction among the idiomatic conditions and a significant three-way interaction among group, familiarity, and transparency.

In terms of the hypotheses associated with the second aim, four findings resulted: a) participants performed least well on opaque idioms, out of context; b) the monolinguals did perform better than the bilinguals on familiar idioms, overall; c) the performance difference between skilled and less-skilled comprehenders on unfamiliar idioms in context was not significant; and d) a significant difference did not emerge between less-skilled and skilled comprehenders on the amount of literal responses.

*Effects of Within-Group Bilingual Proficiency: Aim 3*

Because there may be meaningful differences in results within the bilingual group, depending on age of acquisition (AOA) of English or time spent in the United States, an additional aim concerned whether those bilingual students who were less linguistically assimilated would perform significantly differently than those students who were more linguistically assimilated. To answer this question, the language history questionnaire scores were inserted into a multiple regression formula with four predictors: idiom comprehension total score, error detection score, reading comprehension score, and synonym score. A descriptive summary of the questionnaire responses follows first.

*Descriptive summary of the language experience questionnaire.* The language experience questionnaire asked the participants to self-report some demographic and qualitative information including: a) their countries of origin, b) their families’ countries of origin, c) when they learned English and Spanish, d) if they ever attended school in Spanish, and e) how long they had lived in the United States. Of the 31 total bilingual
participants, 22 (approximately 71%) were born on the mainland of the United States. Of the other 29%, four were born in Puerto Rico, two were born in Cuba, two were born in México, and one was born in Venezuela. Hence, the sample was not a “recent immigrant” sample, as a general rule.

Of the 71% who were born in the United States, the majority of their families originated in México (50%), followed by Puerto Rico (23%), the Dominican Republic (9%), Cuba (9%), and Columbia (9%). Fourteen of the bilingual participants (45%) were reportedly simultaneous Spanish-English learners, and 17 (55%) were sequential language learners. Of the sequential language learners, all but one participant learned Spanish first and English second. This one participant learned English from birth, and Spanish beginning at age 2-years. The rest of the sequential English-language-learners ($n = 16$) began learning English from a) 3-years-of-age (38%) or 4-years-of-age (6%) when they entered a preschool environment; b) from 5-years-of age (25%) when they entered kindergarten; c) from 6-years-of-age when she entered first grade (6%); or d) from 8-years-of-age (25%) when they moved to the U.S. and began grades 2 or 3. One simultaneous language learner who was born in the U.S. had lived in the Dominican Republic briefly and completed all of grade 5 and some of grade 6 there before returning to school in the U.S. All bilingual participants who were born outside of the U.S. (29%) had been living in the U.S. and attending school in English for a minimum of nine years at the time of the study.

**Quantitative analysis of language experience.** Each of the 31 bilingual participants completed the questionnaire. The participants’ cumulative likert scores ranged from 13 – 79 total points ($M = 52.06$, $SD = 19.40$). More points symbolized
greater use of and exposure to Spanish on a daily basis. To investigate the relationship between a student’s score on the questionnaire and that student’s scores on the four measures, a simultaneous multiple regression was conducted. The criterion (dependent) variable was questionnaire scores and the predictor (independent) variables were the four measures (reading comprehension, synonym task, idiom comprehension measure, and error detection task).

Results showed that the model was significant, $F(4, 26) = 3.109$, $MS = 912.747$, $p < .05$. The Adjusted R Square for this model was .219, which meant that these four predictors accounted for approximately 21% of the variance in the criterion variable (questionnaire scores). Caution should be used, however, in interpreting these results since the model entered four independent variables and the sample size was only 31. The Pearson Correlations are presented in Table 4.15. Significant variables are displayed in Table 4.16.

Results demonstrated that there was a negative correlation between questionnaire scores and three of the measures (reading comprehension, error detection, and synonym task). This result may indicate that, as a student’s likert score increased, scores on these measures decreased. In contrast, idiom comprehension, unlike the other three variables, was not correlated with the questionnaire scores, positively or negatively. Finally, the beta values of idiom comprehension ($\beta = .411^*$) and reading comprehension ($\beta = -.472^*$) were both significant. The interpretation is that these two variables had the greatest impact on the criterion variable (questionnaire score). Interestingly, the idiom comprehension beta value was positive, indicating a positive relationship between the measure and the questionnaire, even though they were not correlated.
Table 4.15

Means, Standard Deviations, and Intercorrelations for Bilingual Participants’ Questionnaire Results and Four Predictor Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Questionnaire Results</td>
<td>52.06</td>
<td>19.39</td>
<td>-.168</td>
<td>-.432**</td>
<td>-.365*</td>
<td>.000</td>
</tr>
<tr>
<td>Predictor variable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Synonym Task</td>
<td>14.68</td>
<td>1.90</td>
<td>--</td>
<td>.288</td>
<td>.255</td>
<td>.265</td>
</tr>
<tr>
<td>2. Reading Comprehension Task</td>
<td>35.52</td>
<td>3.05</td>
<td>--</td>
<td>.534**</td>
<td>.528**</td>
<td></td>
</tr>
<tr>
<td>3. Error Detection Task</td>
<td>7.03</td>
<td>2.36</td>
<td>--</td>
<td>.487**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Idiom comprehension measure</td>
<td>32.65</td>
<td>3.20</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < .05

**p < .01

Table 4.16

Simultaneous Regression Analysis Summary for Four Variables Predicting Questionnaire Results

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SEB</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synonym Task</td>
<td>-.673</td>
<td>1.739</td>
<td>-.066</td>
</tr>
<tr>
<td>Reading Comprehension Task</td>
<td>-2.998</td>
<td>1.312</td>
<td>-.472*</td>
</tr>
<tr>
<td>Error Detection Task</td>
<td>-2.438</td>
<td>1.644</td>
<td>-.297</td>
</tr>
<tr>
<td>Idiom Comprehension Task</td>
<td>2.494</td>
<td>1.208</td>
<td>.411*</td>
</tr>
</tbody>
</table>

Note. $R^2 = .324$ ($N = 62, p < .05$).

Descriptive analysis of the simultaneous and sequential learners. To determine if there were any differences between the simultaneous language learners and the sequential
language learners, group means from the idiom comprehension measure, reading comprehension measure, error detection task, and synonym task were compared in a descriptive manner. The two groups performed similarly on all four measures (See Table 4.17); however, the simultaneous language learners ($n = 14$) performed better than the sequential language learners ($n = 17$) on the synonym task - the task that best predicted language group membership. Thus, it appears that the simultaneous language learners may have performed more like the monolinguals, but a larger sample size of simultaneous and sequential language learners would be needed to test this hypothesis.

Table 4.17
Performance Scores on All Four Measures for Simultaneous and Sequential Language Learners

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>Simultaneous</th>
<th></th>
<th>Sequential</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>$M$</td>
<td>$SD$</td>
</tr>
<tr>
<td>Synonym Task</td>
<td>15</td>
<td>1.47</td>
<td>14.41</td>
<td>2.210</td>
</tr>
<tr>
<td>Reading Comprehension</td>
<td>35.36</td>
<td>2.21</td>
<td>35.65</td>
<td>3.673</td>
</tr>
<tr>
<td>Error Detection</td>
<td>7.00</td>
<td>2.18</td>
<td>7.06</td>
<td>2.561</td>
</tr>
<tr>
<td>Idiom Comprehension</td>
<td>32.79</td>
<td>2.39</td>
<td>32.29</td>
<td>3.837</td>
</tr>
</tbody>
</table>

Furthermore, half ($n = 7$) of the simultaneous language learners were considered “skilled comprehenders” and half ($n = 7$) were considered “less-skilled comprehenders”. Eleven of the sequential language learners were considered “less-skilled comprehenders” and only six were considered “skilled comprehenders”. The simultaneous language learners had about the same number of literal (inaccurate) responses ($M = 2.21$, $SD =$...
1.97) as the sequential language learners (\(M = 2.24, SD = 2.71\)). Lastly, the simultaneous learners performed slightly better on the unfamiliar idioms in context (\(M = 9.21, SD = 1.05\)) than the sequential language learners (\(M = 8.76, SD = 1.35\)).

**Summary: Aim 3 findings.** The regression model using the four measures to predict questionnaire scores was significant, but low (Adjusted R Square = .219). More interestingly, all of the measures but the idiom comprehension measure were negatively correlated with the questionnaire likert scores. This may mean that, as likert scores increased (indicating more Spanish use), scores on the three measures decreased, or, inversely, that as likert scores decreased (more English use), scores on measures increased. In contrast to this pattern, the idiom comprehension measure scores were not correlated with the likert scores. However, the beta values of idiom comprehension (\(\beta = .411^*\)) and reading comprehension (\(\beta = -.472^*\)) both significantly impacted on the criterion variable (questionnaire score), with the idiom comprehension beta value indicating a positive relationship between the measure and the questionnaire, even though they were not correlated.

**Overall Summary of Major Findings**

There were six findings associated with the first aim:

1) Performance on the synonym task was the best predictor of group membership.

2) The idiom comprehension measure was significantly correlated with the other three measures (error detection, reading comprehension, and synonym tasks).

3) The error detection, reading comprehension, and synonym tasks were significantly correlated with each other and predicted about 33% of the variance in the idiom comprehension scores.
4) The error detection task accounted for the most variance in idiom comprehension scores.

5) Language group membership did not predict performance on the idiom comprehension measure.

6) The idiom comprehension scores did not predict group membership.

   Next, there were six findings related to the second aim:

1) A statistically significant four-way interaction among language group, idiomatic familiarity, semantic transparency, and contextual support was not found.

2) There was a statistically significant three-way interaction among the idiomatic variables, a statistically significant three-way interaction among language group, familiarity, and semantic transparency, and subsequent two-way interactions and main effects.

3) The lowest mean scores occurred with opaque idioms, out of context.

4) The monolinguals outperformed the bilinguals on familiar idioms.

5) There was not a significant difference between the less-skilled and skilled comprehenders on unfamiliar idioms in context.

6) The number of literal errors did not differentiate the less-skilled from the skilled comprehenders.

   Finally, there were four results associated with the third aim:

1) Of the 31 bilingual participants, 14 were simultaneous language learners and 17 were sequential language learners.

2) The four measures significantly predicted the questionnaire scores.
3) Except for the idiom comprehension measure, all measures were negatively correlated with the questionnaire.

4) The beta values of idiom comprehension and reading comprehension both significantly impacted on the questionnaire score, with idiom comprehension having a positive relationship.
Chapter 5
Discussion

The present study is the first to investigate idiom comprehension in bilingual (Spanish-English) adolescents, while also exploring variables known to contribute to accurate text comprehension, namely, comprehension monitoring, inference generation, and lexical depth. Findings provided new information on the effects of these linguistic variables on idiom comprehension. In addition, differences between the two language groups were found as well as potential qualitative differences between the sequential and simultaneous bilinguals. Discussion focuses on the specific aims of the study and their relation to previous studies. Moreover, the relevance of the findings is discussed in terms of how they do or do not lend support to related models and hypotheses.

Aim 1: Effects of Reading Comprehension, Error Detection, & Synonym Performance on Idiom Comprehension

The first aim was to test the model created for this study. Specifically, the purpose was to determine the extent to which each of three linguistic variables (error detection, reading comprehension, and synonym performance) predicted the criterion variable, idiom comprehension accuracy. Support for the model was found in that the three variables did explain 33% of the variance in idiom comprehension accuracy. Error detection was the most powerful predictor.
Error detection. The error detection task measured comprehension monitoring ability at the micro- and macro- levels. The micro- level refers to each proposition within a sentence or phrase as well as the sentence itself, while macro- level refers to construction of meaning across a text. Thus, poorer performance on the unfamiliar idioms in context would point to a potential problem with comprehension monitoring. Error detection may have required inferencing abilities similar to those tapped in the idiom comprehension measure. This similarity can be explained by the Construction-Integration (C-I) model (Kintsch, 1998), which was the underlying theoretical model for both error detection and idiom comprehension.

To review briefly, the C-I model posits that two phases exist in the process of reading comprehension. During the first phase, meaning is constructed by recognizing each word and then activating each word’s meaning and all of its associated meanings in long-term memory. The second phase, integration, requires the generation of inferences and activation of prior knowledge to form a coherent representation of the text. These two phases are both critical for detecting text violations at the local and global levels, as well as in interpreting ambiguous text, such as idioms. Thus, patterns of performance on both the idiom comprehension test and the error detection task provide support for the C-I model. In addition, Morrison’s (2004) error detection paradigm, which was modified for this study, appeared to be a valid predictor of idiom comprehension ability.

Reading comprehension. Reading comprehension contributed to explaining some variance in the idiom comprehension measure. Perhaps the variance accounted for is due to the fact that the reading comprehension task required the construction and integration of both the micro- and macro- levels of text. On the other hand, the reading
comprehension task was a cloze procedure, which consisted of single, independent sentences that became more demanding as the passages increased in length and complexity. Although inferencing was required to “fill in the blanks” accurately, the ability to construct meaning at a local level was weighted more heavily than was integration of local coherence at a more global level across an expansive text. For example, the basal for the participants’ age group was the following item: Many freshwater turtles are good to eat. Snapping _______ are sold commercially in large numbers. Moreover, cloze procedures may not be the best way to assess reading comprehension when global coherence is the larger aim.

These results are somewhat at odds with past research, which concluded that reading comprehension abilities predicted idiom comprehension abilities (Cain et al., 2005; Levorato et al., 2004; 2007). This interpretation was not strongly supported in the present study. A weaker version was supported; that is, a strong, positive correlation existed between idiom comprehension and reading comprehension. It should be noted, though, that Cain et al. used a different standardized measure of reading comprehension that required answering comprehension questions from the Gray Oral Reading Test-Fourth Edition (Weiderhold & Bryant, 2001) and Levorato et al. utilized a standardized Italian reading measure without cloze procedures. Neither of the measures administered in these two studies consisted of cloze tasks, one potential reason why the present study does not mirror their results. What is more, Cutting and Scarborough (2006) concluded that different cognitive processes may be tapped by varied reading comprehension measures in general; therefore, if a different measure of reading comprehension had been selected for the current study, it may have been more predictive of idiom comprehension.
The positive relationship between idiom comprehension and reading comprehension in this study does suggest that idiom comprehension may be a possible indicator of undetected language-based reading problems in bilingual and monolingual adolescents. The rationale is that idiom comprehension is a vehicle for assessing dynamic interactions among semantic processing, syntactic processing, and inference generation. For example, as Nippold, Moran, and Schwartz (2001) demonstrated in their idiom comprehension study, nearly 24% of participants ($N = 50$; mean age 12 years, 4 months) performed significantly below their peers in inferencing ability and reading skills, even though their teachers had considered them to be progressing normally in reading comprehension before the study. As Nippold et al. (2001) suggest, idiom comprehension tasks could be administered as a screening measure to identify students who are having difficulty with idiom understanding, and, thus, potentially, have undetected reading difficulties.

*Synonym task.* Entering all three measures into the regression model revealed that the synonym task was the least powerful predictor of idiom comprehension accuracy; however, performance on the synonym task was the most powerful predictor of language group membership (bilingual or monolingual). The synonym task was meant as a measure of lexical depth and, in particular, polysemy, or knowledge of a word’s multiple meanings. A word’s meaning is always colored by the social context of use, giving every word different shades of meaning (Nagy & Scott, 2000). Polysemy is important in idiom interpretation since an unfamiliar idiom consists of words that can have literal meanings as well as figurative meanings when in the context of the idiom. Shades of meaning are seldom directly taught (Nagy & Scott, 2000), but are usually implied. Typically, more
frequent words (e.g., think) have more shades of meaning (related and unrelated) than lower frequency words (Nagy & Scott, 2000).

For example, the accuracy of responses decreased for all participants for more literate, less frequent terms, such as: tarry, stratagem, cogitate, capacious, upbraid, fallow, and evanescent. However, the accuracy of the bilingual group declined much sooner on the synonym subtest than did the response accuracy of the monolingual group, beginning with the term amusing. For example, the accuracy percentage of the bilingual group was 39% for amusing compared with 71% for the monolingual group. Many in the bilingual group gave the synonyms fascinating, amazing, or exciting for the term amusing. Another commonly missed item among the bilinguals was the term residence. Many gave the synonym neighbor. Oddly enough, many bilinguals did not provide the correct synonym for consume, which is a cognate in Spanish (consumir). Cognates are translation equivalents or words that look and sound similar and share the same meaning in two languages, such as: different/diferente; área/area. According to Snow and Kim (2007), cognate knowledge must be explicitly taught.

To benefit from cognate knowledge, Spanish-speakers need to recognize similarities in orthography, a skill reserved for those literate in Spanish and less available for those who are only orally proficient. Moreover, Snow and Kim (2007) suggest that even knowledge of fully translatable cognates is not enough to solve most reading comprehension problems because those cognates will not occur frequently enough. In fact, Snow and Kim (2007) conclude that attention to polysemous meaning is the key to exploiting cross-language semantic relationships to enhance reading comprehension. A speculation is that polysemy may be an index of the extent to which bilingual
adolescents’ knowledge of Spanish-English semantic relationships have become integrated or remain overlapped or separated.

It was evident from the study’s results that monolinguals and bilinguals differed most in their performance on the synonym measure, which accessed polysemous meaning. Furthermore, performance on the synonym and the reading comprehension tasks were strongly correlated. If, as a group, the bilingual participants had less well developed lexical depth, then both their familiarity with synonyms and their reading comprehension might be affected. An important factor is that the synonym measure administered (the Reading Vocabulary Subtest from the WJ-III ACH) was not normed on bilinguals, but on monolingual English-speakers. The task was also demanding since it required generation of synonyms without any linguistic context. Nagy (2007) suggests that the provision of linguistic cues, such as sentence order, which requires syntactic awareness, may aid in selecting the appropriate polysemous meaning.

Overall, the results of this study support past research that focused on the importance of lexical depth in literate language development for both monolinguals and bilinguals (McGregor, 2004; Ordóñez, Carlo, Snow, & McLaughlin, 2002; Stahl, 2003). Furthermore, results of studies that have explicitly addressed polysemy in bilinguals (e.g., August, Carlo, Dressler, & Snow, 2005) echo the present study’s findings in that the bilinguals consistently performed below English monolingual peers on tasks of English polysemy. The emerging evidence suggests that knowledge of English vocabulary in adolescents is “…evidently to some extent determined by their distribution of time over their two languages: those who spent the most time talking English and the least time
speaking their native language ended up with the best knowledge of English vocabulary” (Snow & Kim, 2007, p. 133).

Lexical depth, as it relates to reading and academic success, warrants specific attention due to the substantial cognitive complexity it adds to the process of word learning (Ordoñez et al., 2002), and the implications that lexical depth may have for bilinguals’ academic success. It is known that vocabulary knowledge strongly influences reading comprehension in monolinguals (Nagy, 2007). Likewise, Proctor et al. (2005) found that English vocabulary knowledge was critical for improved English reading comprehension in native Spanish-speaking bilinguals. Snow and Kim (2007) discuss this issue in terms of “large problem spaces.” Learning as many English words as their English-only peers, not to mention development of lexical depth, is a large problem space compared to learning letters, phonemes, and spelling patterns, which are incrementally smaller problem spaces. The eradication of these large problem spaces appears linked to intensive and robust vocabulary instruction in early childhood settings and throughout the elementary and secondary grades (Snow & Kim, 2007), as developing lexical depth is one of the keys to becoming truly literate.

Summary. In summary, approximately 33% of the variance on idiom comprehension performance was accounted for by the other three measures. Nonetheless, about 2/3s of the variance was left unexplained. This leads to the speculation that either there may be one or more additional factors at work that were not measured in this study, or, alternately, the measures did not assess the constructs they set out to assess (see Cutting & Scarborough, 2006, on the wide variation in the construct validity of reading comprehension measures). Another explanation for the unexplained variance may be
methodological. Extensive variance left accounted for may be explained by measures that
were so strongly correlated with one other, that disentangling the variables was difficult.

Aim 2: Idiom Comprehension Outcomes.

The second aim of the study was to determine whether there were differences
between the bilingual and monolingual language groups in their performance outcomes
on the idiom comprehension measure. Overall, the monolingual group outperformed the
bilingual group. Specifically, the monolinguals consistently performed better than the
bilinguals on the familiar idioms. One interpretation of this finding is that meaningful
experience with figurative expressions predicts language group performance on familiar
idiom comprehension and, further, that cultural and sociolinguistic factors, particularly
home language, mediates idiom comprehension. In addition, analyses collectively
showed that, with one exception, context facilitated accurate idiom comprehension more
than any other variable. The exception occurred on familiar, transparent idioms where
monolingual performance did not differ between idioms in- or out- of context. The results
of this aim will be discussed in terms of how they relate to past research findings, models,
and hypotheses.

The language experience hypothesis and beyond. One possibility accounting for
these findings is the language experience hypothesis (Ortony et al., 1985; Qualls &
Harris, 1999). Results from this study, as well as others (Cain et al., 2005; Levorato et al.,
2004, 2007); support this hypothesis grounded to concepts about the frequency of input.

A more robust explanation, though, may be the salience of literal meanings for L2
individuals. In the literal salient resonant model (Cieslicka, 2004), literal meanings are
more prominent than figurative meanings for L2 learners, whereas the opposite holds for
their monolingual counterparts. The Cieslicka (2004) model expands on Giora’s (2003) hypothesis of graded salience, which conjectures that more salient meanings (i.e., familiar/frequent meanings) are prioritized and accessed first, despite contextual bias. Cieslicka (2004) points out that L2 learners often encounter the literal meanings of L2 lexical items before they discover the figurative meanings in fixed, conventional phrases, such as idioms. In the present study, it may be that the bilinguals (particularly those with less English experience) relied on single constituent meanings with unknown, transparent idioms leading them to an inaccurate, literal response. An advantage of the literal salient resonance model is that it goes beyond the generality of the language experience hypothesis to explain potentially why the bilingual participants performed less well on familiar idioms than did the monolinguals.

This interpretation is also consistent with prior bilingual research on adult L2 comprehension of idioms (Abel, 2003). Abel’s Dual Idiom Representation (DIR) model posits that second-language learners do not develop as many idiom entries as native speakers due to their lower frequency of encounters with these multiple meanings in the L2. As a result, when an idiom in the second language does not correspond to an idiom in the first language, second language learners may rely more on constituent lexical entries. The findings of the present study, particularly the bilinguals’ overall performance on transparent idioms, also support the DIR model and Abel’s (2003) conclusions. Results also echoed one of Cooper’s (1999) findings. Adult bilinguals, when compared with monolinguals, chose more literal than figurative responses by relying on literal interpretations of unknown idioms.
The Global Elaboration Model. It was evident in this study and in past studies (e.g., Cain et al., 2005) that context was the most facilitative factor in unfamiliar idiom comprehension accuracy, a result that supports the basic tenet of the Global Elaboration Model (GEM). The GEM posits that exploitation of context seems to be the major factor associated with figurative language competence. Previous research (Cain et al., 2005; Nippold & Rudinski, 1993; Nippold & Taylor, 1995) has also found that English speaking pre-adolescents were more likely to recognize familiar, transparent idioms than familiar, opaque idioms when presented without context. This pattern parallels the findings of the present study for both the monolingual and bilingual groups. Although there were not any results contrary to the GEM’s basic processes, the developmental theory behind the GEM was not assessed as part of the current study.

Control of prior knowledge. The majority of the unfamiliar idioms were taken from Cain et al. (2005) who found that their participants performed better on familiar rather than unfamiliar idioms when these were presented out of context. The overall pattern of performance on unfamiliar idioms in the Cain et al. study was similar to the current findings, although the bilinguals performed better than the monolinguals when idioms were both unfamiliar and opaque, in- or out-of-context. More investigation is necessary to determine why the bilinguals performed better in this instance; however, the use of unfamiliar idioms did appear to control for familiarity as well as prior knowledge. For this reason, presenting unfamiliar idioms in context may be an appropriate method for assessing the comprehension monitoring, lexical depth, and inferential skills of bilingual students. Since the unfamiliar idioms were equally unfamiliar to monolinguals and bilinguals alike, this paradigm enables continued comparison of monolingual and
bilingual development in the linguistic and reading comprehension domains with an equitable assessment procedure.

The relationship between reading comprehension and idiom comprehension.

The Cain et al. (2005) and Levorato et al. (2004, 2007) studies are the only ones that have investigated the direct relationship between reading comprehension and idiom comprehension prior to the present study. In their studies a consistent finding was that idiom comprehension and reading comprehension were related. Another related hypothesis was that only those children with better reading comprehension would be able to go beyond the literal meaning of individual semantic constituents to comprehend the global, and, therefore, figurative, meaning of an idiomatic phrase. For example, Cain et al. (2005) found that “poor comprehenders” performed worse than “good comprehenders” on opaque idioms in context.

In this study, even though the “skilled comprehenders” did perform better than the “less-skilled comprehenders” on the unfamiliar idioms in context in absolute terms, the difference was not statistically significant. This finding may be due to a combination of three factors. These include: a) the small amount of items that were unfamiliar, in-context (only 10); b) the manner in which the participants were arbitrarily categorized as “less-skilled” and “skilled” on the grade equivalent scale of the Woodcock Passage Comprehension subtest (WJ-III, Woodcock et al., 2001); and c) the age of the participants in this study (adolescents) compared with the younger pre-adolescent samples in the two prior studies.

A further point is that Cain et al. (2005) and Levorato et al. (2004, 2007) categorized their participants a priori into the two skilled and unskilled reading
categories. Since the participants were older in the present study, perhaps “less-skilled comprehenders” were more able to compensate for weaker inferencing skills since they had more exposure to reading over time. This finding would support a developmental trend in idiom competence; a trend that the GEM postulates is present in the development of idiom comprehension (Levorato et al., 2007).

It should also be noted that support was not evident for Crutchley’s (2007) hypothesis. In brief, Crutchley (2007) hypothesized that children would parse chunks of language into constituent parts only if needed. This hypothesis predicts that participants would always choose more figurative meanings to explain idioms, instead of interpreting idioms word by word. Since even the “less-skilled” comprehenders did not overlook semantic analysis (literal responses) in favor of contextually plausible responses (figurative responses), Crutchley’s (2007) hypothesis was not replicated. However, verb + particle constructions were not a focus in the current study as they were in the Crutchley (2007) study.

Aim 3: Effects of Within-Group Bilingual Proficiency on Performance

The third aim concerned whether those bilingual students who were less linguistically assimilated (spoke less English and more Spanish) would perform differently than those students who were more linguistically assimilated (spoke more English and less Spanish). The four measures (the idiom comprehension, error detection, reading comprehension, and synonym tasks) did significantly predict total questionnaire scores (Adjusted R Square = .219). The amount of variability accounted for in the questionnaire does suggest that the questionnaire is a valid instrument to some degree. Furthermore, all measures, with the exception of the idiom comprehension measure, were
negatively correlated with the questionnaire. Insufficient academic English language knowledge may explain higher likert scores and lower scores on the error detection, reading comprehension, and synonym measures for the bilingual language group overall. In comparison, when everyday use of Spanish decreases and academic English use increases, scores on academic English measures may increase.

Despite the apparent face validity of the questionnaire, it had several limitations. Firstly, likert scores may have lacked strong predictive validity since they were qualitative estimates of the participants’ use of Spanish. Secondly, questionnaire results were not qualified by a more objective measure of language use and proficiency. Thirdly, the questionnaire did not address formal, academic language assimilation as much as everyday conversational language use. This limitation may explain why performance outcomes for the bilinguals on the synonym task and their questionnaire scores were not significantly correlated, even though the synonym task was the best indicator of language group status. Lastly, there were four predictor variables entered into the multiple regression conducted to predict the criterion variable. The results of the regression, therefore, may be inflated since there were only 31 participants in the bilingual sample.

One hypothesis to explain why the simultaneous bilinguals descriptively outperformed the sequential bilinguals is that the simultaneous bilinguals possibly had a more balanced and integrated lexicon than the sequential bilinguals. This hypothesis is consistent with the bilingual model of lexical knowledge (Hernandez, Li, & MacWhinney, 2005). This model depicts developing lexical organization as influenced by simultaneous growth in lexical diversity and lexical depth. Weakly integrated L1 and L2 lexical systems may even cause interference when these bilinguals are asked to define
L2 words (Hernandez et al., 2005). On the other hand, interference from the L1 may signal an emerging convergence of the systems. Theoretically, the L2 of a sequential language learner would first be parasitic on the L1 until it gains enough internal and external resonance to compete with the L1. However, if the L1 has never become entrenched (especially in terms of academic language), then it may not be supportive enough for the L2 to grow in terms of breadth and depth. Therefore, in this scenario, the sequential language learner may appear more like a monolingual with language impairment. Data from this study suggest that the simultaneous bilinguals may have had a more entrenched L2 lexicon than the sequential bilinguals. Furthermore, this pattern implied that learning English and Spanish simultaneously since birth, in this sample at least, may be more advantageous for performance on tasks of English lexical depth. In general, the simultaneous bilinguals performed more like the monolinguals; however, a larger sample of simultaneous and sequential bilinguals is needed to investigate this finding further.

Potential Study Limitations

There are at least four potential limitations of the current study. Firstly, English language proficiency was not assessed in an objective manner. Secondly, there were only four linguistic measures given, none of these measures was administered in Spanish, and all were normed on English speakers. Thirdly, the subgroups (“less-skilled”/“skilled” comprehenders; simultaneous/sequential bilinguals) were not grouped a priori. Lastly, the idiom comprehension measure was a newly constructed measure. Each of these potential limitations will be addressed at length next.
Taking English language proficiency into account. Past research on English language learners (ELLs) has illuminated the fact that these students may appear to be orally fluent in their L2, at least for social interactions, but perform below grade or age level on academic tasks in L2 (Cummins, 2000). In fact, a gap of several years seems to exist between achievement of oral language proficiency and academic proficiency in ELLs’ second languages. Although an ELL may reach peer-appropriate levels of conversational proficiency within a couple of years of exposure to the second language, academic language proficiency may take significantly longer to master (generally 5-7 years). Furthermore, monolingual English-speaking children come to school with oral language proficiency for conversational purposes, they continue to develop academic language proficiency throughout the remainder of their school years (Cummins, 2000).

In the present study all bilinguals had been living in the United States for at least nine years; however, it is possible that the bilinguals had variable levels of experience with and mastery of academic English. In addition to collecting language history via self-report (the language history questionnaire), a quantitative measure of language proficiency may aid in a more refined categorization of bilinguals, such as those with low- and high-proficiency in English. Unfortunately, available English language proficiency tests are not always valid. For example, Pray (2005) investigated how well three commonly used assessments (the Language Assessment Scales-Oral (De Avila & Duncan, 1991; LAS-O), the Woodcock-Muñoz Language Survey (Woodcock & Muñoz-Sandoval, 2001; WMLS), and the IDEA Oral Language Proficiency Test (Ballard, Tighe, & Dalton, 1980; IPT) measured English oral-language proficiency in fourth and fifth grade children who were either native, non-Hispanic, English-speaking monolingual
children \((n = 20)\) or of Hispanic descent \((n = 20)\). None of the native English-speakers scored as ‘fluent’ on the WMLS. In comparison, on the IPT, 85\% of all participants (monolinguals and bilinguals) scored as fluent in English, while performance on the LAS-O indicated that all participants (monolinguals and bilinguals) were fluent in English.

Pray (2005) concluded that the WMLS items may be assessing academic language proficiency instead of oral language proficiency, a point that questions the test’s construct validity. Similarly, Pray (2005) found that the IPT was geared more towards testing academic language proficiency and not oral language proficiency. Lastly, Pray challenges the LAS-O scoring methods and its inter-rater reliability. The investigators in the Pray study and the independent company that scored LAS-Os were at odds in how the measure was scored. Despite these misgivings, measures of English language proficiency may be informative in a research study (such as the one conducted) in order to categorize bilinguals based on their level of academic language proficiency. Based on Pray’s (2005) analysis, it would have also been advantageous to: a) assess the oral English proficiency of both the monolingual and bilingual participants, and b) administer a descriptive measure, such as an oral expository sample, to compare with the outcomes from the formal measure.

*Inclusion of additional spoken language and cross-linguistic assessments of reading comprehension.* Past research has demonstrated that words and expressions that have abstract or multiple meanings are difficult for students with spoken language disorders to interpret (Nippold, 1991). An inclusion criterion for the present study was that participants could not be presently enrolled in speech-language therapy or special
education. It would be valuable, therefore, to assess formally all participants’ spoken language ability to ensure that none had undetected language impairments.

In addition, assessing reading comprehension skills in Spanish would have provided for a rich cross-linguistic analysis. Testing bilinguals in both of their languages is imperative to identify their strengths and needs appropriately. Due to time constraints, these options were not possible in the current study, but would improve future studies of this nature, particularly since the standardized measures used were normed on English speakers.

Sample size and characteristics. Although there were significant findings based on the current sample size, a larger bilingual sample would allow for more quantitative analyses of differences based on sequential or simultaneous language learning. Furthermore, if students were first sorted into “skilled” and “less-skilled” reading comprehenders based on average and below average scores (e.g., below and above the standard score of 85 on a reading comprehension measure with a mean score of 100), then the two reading groups, equal in number, could be compared in a more quantitative manner. One example of this approach is seen in the Cain et al. (2005) study. As it were, reading group membership in this study was determined in a more arbitrary manner (by age equivalency scores) rather than a priori.

Reliability of the idiom comprehension measure. The reliability of the idiom comprehension measure was assessed through a Cronbach Alpha. High internal consistency (r = .965) was demonstrated. However, approximately half of the items (the familiar idioms) had a mean accuracy of .90 and above. This finding brings into question the difficulty level of the measure and the validity of the foils chosen. For instance, the
selection of foils could bias choices, as well as the short stories that were provided as context. On the other hand, the variability found in the standard deviations of these means indicated that even the “easiest” items were not easy for all participants. Moreover, the means were lower and the standard deviations were more variable for all participants when the idioms were unfamiliar. One interpretation is that the unfamiliar idioms represented a more level playing field for both groups, since the monolinguals likely had more experience with the familiar American idioms.

Directions for Future Study

An important direction would be to investigate bilingual adolescents with and without detected language impairments. If idiom comprehension is strongly related to reading comprehension ability, then difficulty with idiom comprehension may also be a diagnostic indicator of language impairment. A longitudinal study following these participants through their school-age years may reveal how figurative understanding emerges over time in typical and atypical language-learners with one or more languages. In addition, long-term assessment should include the development of linguistic variables, such as lexical depth, comprehension monitoring, and inference generation that appear correlated with figurative language development, as well as the effects of approaches to the teaching of reading comprehension.

A second research strand could focus on the corpus of unfamiliar idioms used in the present study. This corpus could be expanded to include more unfamiliar expressions and then normed on a larger group of participants. Furthermore, the current method of presentation (multiple choice) could be compared with another method, such as orally defining the idiomatic expressions. This comparison would allow for critical review of
the present methodology, namely addressing the ceiling scores achieved in this study. Cain et al. (2005) found that the oral definition of idioms was more difficult than multiple choice. Furthermore, Chan and Marinellie (2008) found that adolescents similar in age to the participants in this study defined familiar idioms with accuracy levels that were not significantly different from adults (college students), but which were significantly different from younger preadolescents (grades 4, 5, and 8).

Another direction in this line of research would be to expand the study to examine the variables in both languages, English and Spanish. These studies could assess three of the tasks (comprehension monitoring, reading comprehension, and synonym knowledge) in Spanish as well as English for the bilingual participants. Although many of the bilingual participants stated that they were not able to read in Spanish, assessment in just English is only partially revealing these students’ potential. To obtain a complete picture of bilinguals, assessments need to be attempted in both languages using conceptual scoring. Conceptual scoring involves a bilingual examiner counting overlapping lexical representations (i.e., representations shared by both languages) once. Then, the examiner would allow for responses in either Spanish or English, called singlets (i.e., words represented by only one of the two languages), to be counted correct as well (Bedore, Peña, García, & Cortez, 2005; Pearson, Fernandez, & Oller, 1993). This method is supported by Grosjean’s (1998) holistic view of bilinguals. In other words, conceptual scores do not punish bilinguals for dual language activation at the lexical, lemma, or conceptual levels; and do not reward inhibiting one language to activate another. Proponents argue that this provides a more naturalistic context for testing. Recruiting bilingual participants who are biliterate could make this next direction feasible.
Lastly, neurolinguistic research on figurative language comprehension using neuroimaging tools has yielded promising findings. For instance, studying adults with brain damage and children with either brain damage or callosal agenesis has potentially isolated which neural regions are responsible for accurate interpretation of various kinds of figurative language. These include irony (Pexman & Glenwright, 2007), sarcasm (Shamey-Tsoory, Tomer, & Aharon-Peretz, 2005), metaphors (Ramachandran, 2005), and idioms (Rizzo, Sandrini, & Papagano, 2007). These studies have collectively demonstrated that lesions of the prefrontal cortex, and possibly the ventromedial prefrontal cortex, disrupt accurate figurative language comprehension. It is also posited that corpus callosum development may be important for the emergence of nonliteral language comprehension since the growth of the corpus callosum coincides with figurative language maturation (Huber-Okrainec, Blaser, & Dennis, 2005).

For example, deficits in idiom comprehension have been found in children with corpus callosum agenesis and hypoplasia (Huber-Okrainec et al., 2005). The simultaneous development of the corpus callosum and idiom comprehension may further explain the emergent and developmental trend of figurative language. Future studies using neuroimaging tools to assess inter-hemispheric communication and idiom comprehension in monolingual and bilingual adolescents with language impairment may further reveal why these adolescents struggle with figurative language and reading comprehension.

Furthermore, inhibitory control, which is responsible for literal suppression and essential for idiom comprehension, is localized to the prefrontal cortex, and is closely linked to working memory (Pexman & Glenwright, 2007). Working memory functions
have proven to be important for metaphor comprehension (Kintsch, 2000). Chiappe and Chiappe (2007) found that individuals with high working memory capacity interpreted metaphors with greater accuracy and speed than did individuals with low working memory capacity. Future idiom comprehension studies could include a working memory task and enter this into a regression model along with the linguistic measures. A working memory measure may explain some of the previously unaccounted variability in idiom comprehension ability.

Conclusion

The overarching goal of this study was to add to the current bilingual literature on the relationships between a linguistic domain (idiom comprehension) and reading comprehension. A strong relationship emerged between reading comprehension and idiom comprehension, with comprehension monitoring as the strongest predictor of idiom comprehension. Furthermore, the best indicator of language group membership was performance on the synonym task, indicating that bilingual students in particular need more rigorous and robust vocabulary instruction to develop deeper knowledge of polysemy. Lexical depth and comprehension monitoring are both higher-order skills necessary for proficient text comprehension.

High stakes state assessments place more emphasis on academic vocabulary knowledge as students progress through the grade levels (Alliance for Education, 2007). Reading in a second language is inherently cross-linguistic (Koda, 2007). In order to eliminate those “large problem spaces” (Snow & Kim, 2007), bilinguals need explicit instruction on how to buttress their language/literacy learning in their L2 by exploiting their first language. Unfortunately, bilinguals do not always have a strong base in their
first language on which to build. Thus, instruction based on English derivational
morphology may build a deeper processing stance towards multiple meanings in English
(see Calderon et al., 2005; Carlo, August, & Snow, 2005; Snow & Kim, 2007).

Latino ELLs are persistently over-represented in special education (Koelsch,
2006). As Wagner, Francis, and Morris (2005) cite, “…it is unclear whether limited
language proficiency in English is interfering with learning or is masking a learning
disability, or leads to poor performance on assessments used for identification, which are
not culturally and linguistically appropriate for that purpose” (p. 6). Because of these
issues, recent findings from the National Literacy Panel on language-minority youth
(August & Shanahan, 2006) suggest that ELLs often do not reach the same level of text-
level literacy as their native English-speaking counterparts. Hence ELLs require explicit
and intensive instruction in higher-order, text-level skills, such as making inferences and
using prior knowledge, instead of focusing on “smaller problem spaces” alone.
This study demonstrated a significant difference in higher-order, text-level English
abilities in the monolingual and bilingual participants, such as robust semantic
knowledge, comprehension monitoring, and overall reading comprehension. The results
also suggest that the study of idiom comprehension, because of its ability to provide
insight into semantic depth and comprehension monitoring, does offer a unique vantage
point to investigate the underpinnings of text comprehension. The GEM (Levorato et al.,
2007; Levorato et al., 2004), derived from Kintsch’s (1998) Construction-Integration
model, was supported qualitatively. However, the findings on bilingual adolescents, in
particular, go beyond the GEM because English text comprehension and idiom
comprehension in bilinguals appears to be mediated most powerfully by the vocabulary
of academic language and comprehension monitoring.

This study points to a new direction for the bilingual research. Future studies focused on the linguistic and reading domains of bilinguals need to investigate how more equitable measures of language knowledge, such as unfamiliar idioms, can detect language impairments. More sensitive instruments can result in the type of tailored intervention that, potentially, might lead to increased graduation rates. Most importantly, it is essential to understand how the degree of integration of two lexicons in bilingual students impacts on their development of higher-order skills necessary for academic achievement. In sum, a major priority is the eradication of the large problem spaces (Snow & Kim, 2007) that currently contribute to the literacy gap between bilinguals and their monolingual counterparts.
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Appendix A: USF Signage for Pilot Study Participants
Needed: Bilingual or Monolingual (English) Undergraduates ages 18-35

I need your help!

I am piloting an idiom test and need undergraduate participants ages 18-35. Idioms are a type of figurative language, like kick the bucket

The test will take 15-20 minutes of your time.

If interested please email Belinda Fusté-Herrmann ASAP:

belinda.fuste@verizon.net
Appendix B: Non-significant $t$-test Results
### Non-significant t-test Results

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<thead>
<tr>
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Appendix C: Pilot Study Idiom Comprehension Measure
Idiom Comprehension Measure

Number: __________
Date: __________
Are you bilingual? Yes_____ No ____
Have you lived in the US more than 5 years ____ Less than 5 years _____

Idioms are figurative or non-literal language like raining cats and dogs or bought the farm. I am creating an idiom test and need your help piloting this test before giving it to bilingual and monolingual high school students in the future. Their results will be compared to their reading and vocabulary scores to investigate any meaningful relationships.

Please read each question carefully and then circle the best answer. There may be idioms that you do not know and will guess their meanings. It is important to work forward, and not to go back to change answers. If at any time you wish to stop completing this form you may do so without any consequences whatsoever. This is completely voluntary. If you have any questions feel free to ask me. I would like to thank you for participating.

Familiar: Transparent: Out of Context

1. Hold one’s head up
   a) To prop one’s head up with his hand
   b) To be brave and/or proud
   c) To be angry and/or upset

2. Go by the book
   a) To admire a novel’s character
   b) To read a lot
   c) To follow the rules
3. Take someone under one’s wing
   a) To give someone your seat on a plane
   b) To offer someone guidance
   c) To teach someone to fly

4. Blow off steam
   a) To get rid of stress
   b) To ignore a pot of boiling water
   c) To ride a steam boat

5. Keep a straight face
   a) To laugh in someone’s face
   b) To have plastic surgery on your face
   c) To not smile

6. Right under my nose
   a) To find in an obvious, nearby place
   b) To treat someone unfair, or unkind
   c) To have a thin mustache under your nose

7. Crying over spilled milk
   a) To cry because the milk was split on the floor
   b) To cry over something that has already happened
   c) To complain about someone’s cooking
8. Burning the candle at both ends
   a) To let a candle’s wick burn at the top and the bottom
   b) To work and/or play too hard without enough rest
   c) To not be wasteful

9. Hold your tongue
   a) To tell a lie
   b) To pinch your tongue between your fingers
   c) To keep quiet

10. Get off on the wrong foot
    a) To make a bad start
    b) To have a limp
    c) To follow someone’s lead

11. Take a shot in the dark
    a) To shoot a gun at night
    b) To be worse than expected
    c) To take a guess

12. The early bird catches the worm
    a) The one who arrives early will be successful
    b) Worms are only available in the morning
    c) The one who can keep a secret is trustworthy
Familiar: Opaque: Out of Context

1. Beat around the bush
   a) To beat a bush with a stick
   b) To avoid a topic
   c) To win a race by the length of a bush

2. Bring the house down
   a) To make others applaud a spectacular performance
   b) To make a room full of people angry
   c) To tear down a house with a bulldozer

3. Paint the town red
   a) To make everyone mad in town
   b) To go out and celebrate
   c) To paint a big city, like New York, red

4. Have a soft spot in one’s heart
   a) To have a pain in one’s heart
   b) To have a heart murmur
   c) To be fond of something or someone

5. Chip off the old block
   a) To act or look like one’s parent(s)
b) To live on the same block as one’s family
c) To save a piece of brick from a house’s foundation

6. Spill the beans
   a) To lie to someone
   b) To tell a secret
   c) To drop a pot of freshly cooked beans

7. At the drop of a hat
   a) To do as soon as it is convenient
   b) To change into a uniform with a hat
   c) To do something immediately, without pressure

8. Go to pot
   a) To put in the trash can
   b) To deteriorate
   c) To go to the bathroom

9. Wet behind the ears
   a) To be inexperienced
   b) To be a good swimmer
   c) To comb your hair back behind your ears

10. Jump through hoops
    a) To be in the circus
b) To do whatever one is told

  c) To be a good athlete

11. Go cold turkey

  a) To not heat up the turkey

  b) To know something really well

  c) To stop an addictive behavior immediately

12. To flip one’s lid

  a) To open the hood

  b) To be ecstatic

  c) To be very angry
Familiar: Transparent: In Context

1. Hold one’s head up

After Judy’s teacher notices her cheating on an exam, Judy finds it hard to hold her head up.

a) To prop one’s head up with his hand
b) To be brave and/or proud
c) To be angry and/or upset

2. Go by the book

Officer Knack is a nice guy, but he never lets a criminal get away with a crime. He goes by the book.

a) To admire a novel’s character
b) To read a lot
c) To follow the rules

3. Take someone under one’s wing

The more experienced pilot taught the newcomer, Jerry, how to fly the jet. He took Jerry under his wing.

a) To give someone your seat on a plane
b) To offer someone guidance
c) To teach someone to fly
4. Blow off steam

Alex had had a difficult week at work. He could not wait to blow off steam once Friday night arrived.

a) To get rid of stress

b) To ignore a pot of boiling water

c) To ride a steam boat

5. Keep a straight face

Barbara was an experienced practical joker, but after seeing Jane’s face it was hard to keep a straight face.

a) To laugh in someone’s face

b) To have plastic surgery on your face

c) To not smile

6. Right under my nose

Steve trusted all of his family and friends. That’s why it was so hard to accept that the thief was right under his nose.

a) To find in an obvious, nearby place

b) To treat someone unfair, or unkind

c) To have a thin mustache under your nose
7. Crying over spilled milk

Reece had spent her last dime on ingredients for her and Lindsey’s dinner. But when Lindsey accidentally knocked the pot of soup onto the floor and began to weep, Reece said, “There is no use *crying over spilt milk*.”

a) To cry because the milk was split on the floor  

b) To cry over something that has already happened and cannot be reversed  

c) To complain about someone’s cooking

8. Burning the candle at both ends

Shirley believed in using every bit of her time in the day. She worked two jobs and went out every night until dawn. Her friends always told her that she was *burning the candle at both ends*.

a) To let a candle’s wick burn at the top and the bottom  

b) To work and/or play too hard without enough rest  

c) To not be wasteful

9. Hold your tongue

Chad knew that Bob had taken Sue’s bike. But, when Sue asked Chad and Bob who took it, Chad *held his tongue*.

a) To tell a lie  

b) To pinch your tongue between your fingers  

c) To keep quiet
10. Get off on the wrong foot

Susan wanted to be on the marching band at school more than anything, but she was late to her first practice and forgot her drum sticks. The band leader thought that Susan had gotten off on the wrong foot.

a) To make a bad start

b) To have a limp

c) To follow someone’s lead

11. Take a shot in the dark

Steve did not have time to study for his exam. For the essay question he took a shot in the dark.

a) To shoot a gun at night

b) To be worse than expected

c) To take a guess

12. The early bird catches the worm

Martha packed her briefcase the night before her interview. She was prepared because she knew that the early bird catches the worm.

a) The one who arrives early will be successful

b) Worms are only available in the morning

c) The one who can keep a secret is trustworthy
Familiar: Opaque: In Context

1. Beat around the bush

Mark failed his big science test. When Mark’s mom asked how biology class was going, Mark started telling her about his English project. But Mark’s mom knew something was wrong, and that he was just beating around the bush.

   a) To beat a bush with a stick
   b) To avoid a topic
   c) To win a race by the length of a bush

2. Bring the house down

Sara had practiced her trumpet solo for a whole month. When her band finally played in the club, she blew her trumpet with so much enthusiasm that she brought the house down.

   a) To make others applaud a spectacular performance
   b) To make a room full of people angry
   c) To tear down a house with a bulldozer

3. Paint the town red

Bobby just graduated from New York University. To celebrate he and his friends went out and painted the town red.

   a) To make everyone mad in town
   b) To go out and celebrate
   c) To paint a big city, like New York, red
4. Have a soft spot in one’s heart

Even though Jasmine was allergic to cats, she had a soft spot in her heart for the orange and black stray, and always let her in for a dish of milk.

a) To have a pain in one’s heart
b) To have a heart murmur
c) To be fond of something or someone

5. Chip off the old block

Jose was a hard worker who had already been successful in his career and bought a home by age 25. His family and neighbors said that he was a chip off the old block.

a) To act or look like one’s parent(s)
b) To live on the same block as one’s family
c) To save a piece of brick from a house’s foundation

6. Spill the beans

Sandra felt so guilty about what she had done to her little brother that she eventually spilled the beans about how his game boy got broken.

a) To lie to someone
b) To tell a secret
c) To drop a pot of freshly cooked beans

7. At the drop of a hat

Xavier really admired his grandmother. Anytime she would ask him to come visit he would do so at the drop of a hat.

a) To do as soon as it is convenient
8. Go to pot

Nell was so disappointed when she went back to her old neighborhood. Everything was so dirty and full of garbage and had really *gone to pot.*

a) To put in the trash can

b) To deteriorate

c) To go to the bathroom

9. Wet behind the ears

Jack watched his new teammates do the butterfly back and forth in the swimming pool. He longed to be that good, but right now he was new to the team and a little *wet behind the ears.*

a) To be inexperienced

b) To be a good swimmer

c) To comb your hair back behind your ears

10. Jump through hoops

Nancy wanted to be a part of the group more than anything. For this reason, she was willing to *jump through hoops* to be accepted.

a) To be in the circus

b) To do whatever one is told

c) To be a good athlete

11. Go cold turkey
John had tried to quick smoking many times. This time he was not going to gradually stop smoking though, he was going to go cold turkey.

a) To not heat up the turkey

b) To know something really well

c) To stop an addictive behavior immediately

12. To flip one’s lid

Tyrone’s parents were away for the weekend. He had promised not to invite anyone over to the house while they were gone. When his parents returned to see the house in shambles from a party, they flipped their lids.

a) To open the hood

b) To be ecstatic

c) To be very angry
Unfamiliar Idioms: Transparent: Out of Context

1. To be caught between two fires
   a) To be in the middle of flames
   b) To be in a hurry
   c) To be caught between two difficult choices

2. To run around like scalded pigs
   a) To rush about crazily
   b) To be even worse than anticipated
   c) To squeal a lot

3. For a good hunger there is no hard bread
   a) Hard bread is better when you are starving
   b) To bore someone
   c) Anything tastes good when you are hungry

4. To shoot sparrows with cannons
   a) To defeat the enemy without exhausting oneself
   b) To use excessive means to fulfill an objective
   c) To kill many birds at once

5. To be drowning in a glass of water
   a) To be upset over nothing
   b) To hit a snag
c) To swallow too much water and choke

6. To try to make a hole in water
   a) To dive into the water
   b) To make a good impression
   c) To try to do something that is impossible

7. To hold someone’s leg
   a) To wait a while
   b) To bore someone with endless conversation
   c) To make someone fall down

8. It’s the water drop that makes the vase overflow
   a) The last thing that happened that finally made you upset
   b) To exaggerate the situation
   c) To waste water

9. To fall down with four horseshoes up in the air
   a) To be embarrassed
   b) To fall flat on one’s back
   c) To fall down while playing horseshoes

10. To fall into the apples
    a) To pass out
    b) To become rich
    c) To fall while picking fruit
11. To cut a pear in two
   a) To split a snack
   b) To meet in the middle
   c) To argue about something small

12. To throw flowers to somebody
   a) To throw flowers during a parade
   b) To speak highly of someone
   c) To squander money
Unfamiliar Idioms: Opaque: Out of Context

1. The turtle is shrouded
   a) The sky is foggy
   b) Someone is undercover
   c) To be selfish

2. To eat the leaf
   a) To be a vegetarian
   b) To be late to work
   c) To keep a secret

3. To pet the horse first
   a) To win a bet at the track you have to arrive early
   b) Rushing into something leads to mistakes
   c) To get up early

4. To be at the green
   a) To be out of money
   b) To be a novice
   c) To be at the golf course

5. To have salt in your pumpkin
   a) To make something sour
b) To be intelligent

c) To be arrogant

6. To whistle in your thumb
   a) To be quiet
   b) To avoid talking about something
   c) To be unable to get what you want

7. To put one’s finger into one’s eye
   a) To have influence
   b) To poke oneself in the eye
   c) To be entirely mistaken

8. To pick up a log
   a) To fall down and hurt oneself
   b) To hurry up
   c) To gather wood for a fire

9. To eat on the thumb
   a) To grab a bite to eat
   b) To eat small appetizers
   c) To eat too much

10. To play the donkey to get bran
    a) To play a child’s game

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b) To play dumb

c) To get on someone’s nerves

11. Between dog and wolf

a) At dusk

b) A dog having wolf characteristics

c) To be cruel

12. To lay a rabbit on someone

a) To tell a lie

b) To stand someone up

c) To try to hold on to a fast animal
1. To be caught between two fires

June was a star tennis player at her high school. She had to make a decision quickly, because she was running out of time. She had to decide if she wanted to go the university that had a girl’s tennis team, or the one that she had a scholarship to attend. She was caught between two fires.

a) To be in the middle of flames
b) To be in a hurry
c) To be caught between two difficult choices

2. To run around like scalded pigs

The twins had waited until the day of the party to buy all the refreshments and decorations. At 6pm, an hour before the party, they were running around like scalded pigs.

a) To rush about crazily
b) To be even worse than anticipated
c) To squeal a lot

3. For a good hunger there is no hard bread

Jason had been hiking all day, and had forgotten to pack his lunch with him. By the time he made it home he was starving. His mother said that all she was making for dinner was leftovers. Jason told her that for a good hunger there is no hard bread.

a) Hard bread is better when you are starving
b) To bore someone
c) Anything tastes good when you are hungry

4. To shoot sparrows with cannons
Matt wanted to win the contest more than anything. He put up posters urging his peers to vote for him, promised prizes to those who did, and rented a bullhorn to remind people to vote for him the next day. Some people voted for him, but some thought that he was *shooting sparrows with cannons*.

a) To defeat the enemy without exhausting oneself
b) To use excessive means to fulfill an objective
c) To kill many birds at once

5. To be drowning in a glass of water

Julie had studied all night for her exam. When she received a B on it, she was hysterical. Her friends heard her complaints and told her that she was just *drowning in a glass of water*.

a) To be upset over nothing
b) To hit a snag
c) To swallow too much water and choke

6. To try to make a hole in water

Jeremy only had $2.35 dollars to spend. When he continued to believe that he could buy a train ticket and have enough money for lunch, his friends told him that he was *trying to make a hole out of water*.

a) To dive into the water
b) To make a good impression
c) To try to do something that is impossible

7. To hold someone’s leg

Jill has a reputation for talking about her pet birds obsessively. When Terry was finally able to walk away from Jill at the party, she told Matt, “Jill really knows how to hold someone’s leg.”

a) To wait a while
b) To bore someone with endless conversation

c) To make someone fall down

8. It’s the water drop that makes the vase overflow

Sam had been late to work several times and had left early almost every day. Stacey
worked with Sam, and did not think that his behavior was fair. She thought about talking
to her boss but didn’t want to get Sam in trouble. One day Sam was supposed to take
Stacey’s place after her shift. When Sam came in to work so late that Stacey missed her
bus home, *it was the water drop that made the vase overflow*.

a) The last thing that happened that finally made you upset

b) To exaggerate the situation

c) To waste water

9. To fall down with four horseshoes up in the air

Sean tried to run home to get out of the cold, but there was a big patch of ice on the
pavement and he *fell down with four horseshoes up in the air*.

a) To be embarrassed

b) To fall flat on one’s back

c) To fall down while playing horseshoes

10. To fall into the apples

When Sheila got the news over the phone, she was so surprised that she *fell into the
apples*.

a) To pass out

b) To become rich

c) To fall while picking fruit
11. To cut a pear in two

Jimmy wanted to go to the mall, but Sydney wanted to go to the movies. They decided to cut a pear in two and do both.

a) To split a snack

b) To meet in the middle

c) To argue about something small

12. To throw flowers to somebody

Rachel respected her teacher, and when someone asked her about Mr. Feder she threw flowers to him.

a) To throw flowers during a parade

b) To speak highly of someone

c) To squander money
Unfamiliar Idioms: Opaque: In Context

1. The turtle is shrouded

Bill had a hard time driving down the mountain in the morning. It had been raining and the visibility was low because *the turtle was shrouded.*

a) The sky is foggy
b) Someone is undercover
c) To be selfish

2. To eat the leaf

Sandy told Gina not to tell anyone what she had said. Gina promised *to eat the leaf.*

a) To be a vegetarian
b) To be late to work
c) To keep a secret

3. To pet the horse first

Jacob had not waited for the paint to dry before loading in the furniture. He ruined the new paint job. His mother said, “That’s what happens when you *pet the horse first.*”

a) To win a bet at the track you have to arrive early
b) Rushing into something leads to mistakes
c) To get up early

4. To be at the green

Lindsey went to the bank and was surprised that she was not able to withdraw any money from the ATM. She did not realize that she *was at the green*
a) To be out of money
b) To be a novice
c) To be at the golf course

5. To have salt in your pumpkin

Ginny had passed all her exams and had gotten onto the honor role. Her teachers and classmates all knew that she had salt in her pumpkin.

a) To make something sour
b) To be intelligent
c) To be arrogant

6. To whistle in your thumb

Leslie wanted a new car more than anything, but without a paycheck she was whistling in her thumb.

a) To be quiet
b) To avoid talking about something
c) To be unable to get what you want

7. To put one’s finger into one’s eye

When Sara’s boss accused her of leaving early, Sara protested. Sara showed her boss her timecard to prove that she hadn’t left and told him that he put his finger in his eye.

a) To have influence
b) To poke oneself in the eye
c) To be entirely mistaken

8. To pick up a log
Karen did not realize that the temperature had dropped and the sidewalk had frozen. When she tried to run across the street she **picked up a log.**

a) To fall down and hurt oneself  
b) To hurry up  
c) To gather wood for a fire  

9. To eat on the thumb  
Thomas was in a hurry to get to school and missed breakfast. On the way to the bus he **ate on the thumb.**

a) To grab a bite to eat  
b) To eat small appetizers  
c) To eat too much  

10. To play the donkey to get bran  
Max was the only one home after school. When his mom came home and asked who had eaten all the cake, Max **played the donkey to get bran.**

a) To play a child’s game  
b) To play dumb  
c) To get on someone’s nerves  

11. Between dog and wolf  
Zoe was supposed to be home before dark. Her parents were pleased when she arrived **between dog and wolf.**

a) At dusk  
b) A dog having wolf characteristics  
c) To be cruel
12. To lay a rabbit on someone

Philip waited on Stanley for nearly an hour at the park before he realized that Stanley had *laid a rabbit on him*.

a) To tell a lie

b) To stand someone up

c) To try to hold on to a fast animal
Idiom Comprehension in Bilingual and Monolingual Adolescents: Pilot Study
Belinda Fuste-Hermann, USF, Tampa

1. General Information of the Research Study:
You are invited to participate in a pilot research study "Idiom Comprehension in Bilingual and Monolingual Adolescents". There is evidence of a strong relationship between idiom comprehension and reading comprehension. This study will examine this relationship through an idiom measure. Before using the idiom assessment with adolescents, we need to pilot the idiom measure. If you decide to participate in this pilot study, you will be answering questions about the meanings of idioms such as "spill the beans". This task should only take 15-20 minutes of your time. A PhD student in the Department of Communication Sciences and Disorders at the University of South Florida (USF) is conducting this study with the supervision of her faculty advisor.

2. Description of the Research Study:
During this study you will be requested to answer multiple choice questions about idioms such as "paint the town red". The entire study should take approximately 15-20 minutes.

3. Benefits of the Study:
You will not directly benefit from the results of this study; however, the results will assist in making the idiom measure more precise in preparation for testing adolescents.

4. Volunteering for the Study:
Your decision to participate in this pilot study is completely voluntary. If you choose not to participate in the study, there will be no penalty to you. Neither refusal to participate nor the results obtained from the study will in any way affect you. Each participant will be assigned a number, and his/her answers will remain anonymous. Also, you will not be paid for participation in this study, but you will receive 1 point extra credit for every 15 minutes of participation. Your decision to participate or not participate will in no way affect your student status. Finally, there are no known risks to participants.

5. Confidentiality of the Records:
All information received from the idiom measure will be kept confidential to the extent of the law. Authorized research investigators, agents of the department of Health and Human Services, USF Institutional Review Board, and its staff, and any other individuals acting on behalf of USF, may inspect all records from this project. While the results of this study may be reported at professional meetings, published in professional meetings, published in professional journals, or used for training graduate students in Communication Sciences and Disorders, your anonymity will be maintained. Individual data will be coded by number without names. All data will be kept in a locked language laboratory in the Department of Communication Sciences and Disorders at the University of South Florida. The room also has an electronic security system for additional security.

6. Instructions:
Please read and sign the consent form (printed on the back) and promptly return it to Belinda Fuste-Hermann, the research investigator, at the USF Department of Communication Sciences and Disorders, who will be collecting these forms, and will be available to answer any questions. I would greatly appreciate your help in completing the questionnaire. If you have any additional questions, please call Belinda at (813) 370-1980. Once the study is completed, we will be happy to provide a summary of results to anyone who requests a copy. If you have any questions concerning your rights as a person who is taking part in a research study, you may contact a member of the Division of Research Compliance of the University of South Florida at (813) 974-5638.

Thank You for Your Help!

Please turn the page over.
Participant's Name ___________________________ D.O.B ________

Your Consent: By signing this form I agree that:
- I have fully read or have had read and explained to me in my native language this informed consent form describing a research project.
- I have had the opportunity to question one of the persons in charge of this research and have received satisfactory answers.
- I understand that I am being asked to participate in this study. I understand the risks and benefits, and I freely give my consent to participate in the research project outlined in this form, under the conditions indicated on it.

<table>
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<th>Signature of Participant</th>
<th>Printed Name of Participant</th>
<th>Date</th>
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By signing this form I agree that: Participants have been provided with adequate information relative to the study. A phone number has been provided in case of questions.

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<th>Signature of Investigator</th>
<th>Printed Name of Investigator</th>
<th>Date</th>
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Institutional Approval of Study and Informed Consent
This research project/study and informed consent form were reviewed by the University of South Florida Institutional Review Board for the protection of human subjects. This approval is valid until the date provided below. The board may be contacted at (813) 974-5638.

Approval Consent Form Expiration Date: ____________
Revision Date: ____________

[Stamp: APPROVED]

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Appendix E: Pilot Study Synopsis
Idiom Comprehension Pilot Study at USF

Thank you for participating in this pilot study. This is a precursor to a larger study that will be conducted with monolingual and bilingual adolescents at area high schools beginning in the fall. This idiom test was created by the investigator, and the purpose of this pilot study is to ensure its validity. Background information, rationale, and the specific aims of the larger quasi-experimental study follow.

Federal data on the bilingual population demonstrates that a gap exists in reading proficiency between Hispanic students and Caucasian students. For example, results from The 2005 National Assessment of Educational Progress (NCES, 2005) showed a 25 point score gap at grade 8 between Hispanic and White students. Although this gap has been narrowed somewhat since 2003, the breadth of the gap remains. Other data from the National Center of Education Statistics (NCES, 2000) shows that the high school drop-out rate of Hispanic students born outside of the United States also remains high (42.2%). These data are evidence of how low reading proficiency puts the bilingual adolescent population at risk for failing mandatory state assessments, including those now required for high school graduation, and creates conditions for not completing high school.

Idioms, a type of non-literal, figurative language, such as spill the beans, are pervasive in classroom discourse and academic text books. In monolingual English-speaking children, a positive relationship appears to exist between idiom comprehension and the level of reading comprehension at age 9 years (Cain, Oakhill, & Lemmon, 2005), and a similar relationship was found between idiom comprehension and overall academic achievement in monolingual adolescents (Nippold & Martin, 1989). A need currently exists to explore whether the same relationship holds between idiom comprehension and reading proficiency in bilingual (Spanish-English) adolescents.

Reading comprehension and idiom comprehension appear to share similar cognitive-linguistic processes. Thus, insight into idiom comprehension may help to illuminate the underpinnings of reading comprehension as an inferential process. This rationale is supported by the Global Elaboration Model (GEM) (Levorato et al., 2004), a semantic analysis model focusing on how the meanings of an idiom's separate words contribute to its overall figurative interpretation. Three factors affect the semantic analysis of idioms: semantic transparency, or the relationship between an idiom's literal and non-literal meanings; contextual cues, used to infer the meaning of an idiom; and familiarity, or the frequency with which an idiom occurs in a language.
Unlike any idiom comprehension study conducted to date, this study's purpose is to investigate idiom comprehension in bilingual (Spanish-English) adolescents through a methodology that includes the systematic evaluation of semantic transparency, context, and familiarity of English idioms, as they relate to both idiom comprehension and English reading comprehension. Moreover, idiom comprehension may have potential clinical implications as a diagnostic marker of undetected language/reading impairment, thus this study is of considerable significance. The performance of bilingual adolescents will be compared to a group of their age-matched, monolingual (English) peers.

**Specific Aim 1.** To determine the roles that semantic transparency and context play in English idiom comprehension in bilingual (Spanish-English) adolescents.

**Hypothesis.** Bilingual adolescents will perform better on transparent rather than opaque English idioms, and will benefit from contextual cues.

**Specific Aim 2.** To examine whether an association exists between idiom comprehension and reading comprehension for bilinguals by comparing English reading comprehension scores with scores on English familiar idioms (i.e., more frequent idioms) and unfamiliar idioms (i.e., less frequent idioms) presented in a short story context, as well as comparing their monolingual English peers scores to detect differences among monolinguals' and bilinguals' performance.

**Hypothesis.** There will be a positive relationship between performance on the idiom comprehension measure (specifically the opaque, novel idioms in context) and the reading comprehension scores in both language groups, with the monolinguals and the bilingual performing differently.
Appendix F: Polk County Public Schools Approval
Ms. Fuste-Herrmann,

The Polk County Public Schools Research Review Board has conditionally approved your "Idiom Comprehension and Reading Comprehension" research proposal. Final approval will be granted upon satisfactory completion of the following:

- Documentation of final IRB approval from your university

Please submit this documentation to my attention at the office of Assessment, Accountability, and Evaluation as soon as it becomes available.

Martha Santiago, Director of ESOL, will be your district contact. Please contact her before beginning your project and keep her aware of your progress. A copy of your final research report must be submitted to her office and my office upon competition.

If you have any questions, or if I can be of any further assistance, please contact me at the phone number or email address below.

Thanks,

Morgan Platt
Polk County Public Schools
Evaluation & Research, Senior Coordinator
Assessment, Accountability & Evaluation
(863)534-0736
morgan.platt@polk-fl.net
Can you help us?

1. General Information of the Research Pilot Study:
Your child is invited to be in a small research study called "Idiom Comprehension in Bilingual and Monolingual Adolescents".

Understanding English idioms like raining cats and dogs may be important to reading comprehension. We are creating a test of idiom comprehension, and need adolescent students to judge how familiar certain idioms are. We will ask the students to rate idioms as: a) Know what it means, b) Heard it, but do not know what it means, or c) Never heard it, on a checklist. The results of their answers will help us make a more accurate test.

This is an important aim because the FCAT that students are required to take and pass in order to graduate contain readings using literal and non-literal (such as idioms) language. Faculty and a bilingual/bilingual PhD student in the Department of Communication Sciences and Disorders at the University of South Florida (USF) are conducting this study. Polk County Board of Education, the administrators, and a teacher at your child's school have allowed us to do this study. We need your help, and are asking permission to include your child.

2. Description of the Research Study:
This study will include adolescents in your child's school. The students will not be taken out of class to complete the checklist. The study will take approximately 10-15 minutes.

3. Benefits of the Study:
Your child will not directly benefit from the results from this study; however, results will help educators better understand how idiom comprehension skills of adolescents relate to their reading abilities. This is related to idiom comprehension. We hope that in future, this study will benefit adolescents who are struggling with reading comprehension.

4. Volunteering for the Study:
Your decision to allow your child to participate in this research study is completely voluntary. You are free to allow your child to participate in this research study or to withdraw him/her at any time. If you choose not to allow your child to participate in this research study or to withdraw him/her, there will be no penalty to you or your child. Neither refusal to participate nor the results obtained from the study will in any way affect your child's grades or eligibility for a special program in your school district. You and your child will not be paid or receive special considerations for participation in this study. The participants will be entered in a raffle, though, to win two pairs of movie tickets for two participants. There are no known risks to participants.

5. Confidentiality of Your Child's Records:
All data and results from this study will be kept confidential to the extent of the law. Authorized research investigators, agents of the department of Health and Human Services, USF Institutional Review Board, and its staff, and any other individuals acting on behalf of USF, may inspect all records from this project. While the results of this study may be reported at professional meetings, published in professional journals, or used for training graduate students in Communication Sciences and Disorders, your child's anonymity will be maintained. Each child's individual data will be coded by number without the child's name and school. All data will be kept in a locked language laboratory in the Department of Communication Sciences and Disorders at the University of South Florida. The room also has an electronic security system for additional security.

6. Instructions:
Please read and sign the consent form (printed on the back) and promptly return it to your child's teacher. You may get additional information from Belinda Fusté-Herrmann, the research investigator, at the USF Department of Communication Sciences and Disorders. We would greatly appreciate your help in allowing your child to be part of this important study. If you have any additional questions, please call Belinda at 863-370-1980. Once the study is completed, we will be happy to provide a summary of results to any parent or guardian who requests a copy. If you or your child have a question about your child's right as a person who is taking part in a research study, you or your child may contact a member of the Division of Research Compliance of the University of South Florida at (813) 974-5638.

Please Return to Your Classroom Teacher by:

Thank You for Your Help!

Please turn the page over.
Child’s Name ___________________________ D.O.B ____________

Teacher’s Name ___________________________

Your Consent: By signing this form I agree that:
- I have fully read or have had read and explained to me in my native language this informed consent form describing a research project.
- I have had the opportunity to question one of the persons in charge of this research and have received satisfactory answers.
- I understand that I am being asked to allow my child to participate in this study. I understand the risks and benefits, and I freely give my consent to allow my child to participate in the research project outlined in this form, under the conditions indicated on it.

Signature of Parent of Participant ___________________________ Printed Name of Parent ___________________________ Date ____________

Child’s Assent Statement
The research study called *Idiom Comprehension in Bilinguals and Monolinguals* has been explained to me. I agree to be in this study.

Signature of Child ___________________________ Printed Name of Child ___________________________ Date ____________

Signature of Parent ___________________________ Printed Name of Parent ___________________________ Date ____________

Signature of Investigator ___________________________ Printed Name of Investigator ___________________________ Date ____________

Signature of Witness ___________________________ Printed Name of Witness ___________________________ Date ____________

By signing this form I agree that: Participants have been provided with adequate information relative to the study. A phone number has been provided in case of questions.

Signature of Investigator ___________________________ Printed Name of Investigator ___________________________ Date ____________

Institutional Approval of Study and Informed Consent
This research project/study and informed consent form were reviewed by the University of South Florida Institution Review Board for the protection of human subjects. This approval is valid until the date provided below. The board may be contacted at (813) 974-5638.

Approval Consent Form Expiration Date: ___________________________
Revision Date: ___________________________

APPROVED

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Appendix H: Familiarity Forms
Familiarity Rating Form

Idioms are figurative or non-literal language like raining cats and dogs or bought the farm. As you remember, I am creating an idiom test and need your help to decide which idioms on my list are familiar to you. Please read each idiom carefully and decide if you a) Know it, b) Heard it before, but do not know what it means, or c) Never heard it before. Then, just place a check mark under the appropriate column. If at any time you wish to stop completing this form you may do so without any consequences whatsoever. This is completely voluntary. If you have any questions feel free to ask me. Thank you for participating.

<table>
<thead>
<tr>
<th>Idiom</th>
<th>Know it</th>
<th>Heard it, but don’t know what it means</th>
<th>Never heard it before</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Hold one’s head up</td>
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<tr>
<td>2. Go by the book</td>
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<td>3. Take someone under one’s wing</td>
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<tr>
<td>4. Blow off steam</td>
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<td>5. Keep a straight face</td>
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<tr>
<td>6. Right under my nose</td>
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<td>7. Cried over spilled milk</td>
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<td>8. Burning the candle at both ends</td>
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<td>9. Hold your tongue</td>
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<td>10. Get off on the wrong foot</td>
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<td>11. Take a shot in the dark</td>
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<td>12. The early bird catches the worm</td>
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<td>13. Beat around the bush</td>
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<td>14. Bring the house down</td>
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<td>15. Paint the town red</td>
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<td>16. Have a soft spot in one’s heart</td>
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<td>17. Chip off the old block</td>
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<td>18. Spill the beans</td>
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<td>19. At the drop of a hat</td>
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<td>20. Go to pot</td>
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<td>21. Wet behind the ears</td>
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<td>22. Jump through hoops</td>
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<td>23. Go cold turkey</td>
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<td>24. To flip one’s lid</td>
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<td>25.</td>
<td>To be caught between two fires</td>
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<td>26.</td>
<td>To run around like scalded pigs</td>
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<td>27.</td>
<td>For a good hunger there is no hard bread</td>
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<td>28.</td>
<td>To shoot sparrows with cannons</td>
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<td>29.</td>
<td>To be drowning in a glass of water</td>
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<td>30.</td>
<td>To try to make a hole in water</td>
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<td>31.</td>
<td>To hold someone's leg</td>
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<td>32.</td>
<td>It’s the water drop that makes the vase overflow</td>
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<td>33.</td>
<td>To fall down with four horseshoes up in the air</td>
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<td>34.</td>
<td>To fall into the apples</td>
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<td>35.</td>
<td>To cut a pear in two</td>
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<td>36.</td>
<td>To throw flowers to somebody</td>
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<td>37.</td>
<td>The turtle is shrouded</td>
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<td>38.</td>
<td>To eat the leaf</td>
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<td>39.</td>
<td>To pet the horse first</td>
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<td>40. To be at the green</td>
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<td>41. To have salt in your pumpkin</td>
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<td>42. To whistle in your thumb</td>
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<td>43. To put one’s finger into one’s eye</td>
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<td>44. To pick up a log</td>
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<td>45. To eat on the thumb</td>
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<tr>
<td>46. To play the donkey to get bran</td>
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<tr>
<td>47. Between dog and wolf</td>
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<tr>
<td>48. To lay a rabbit on someone</td>
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</tbody>
</table>

Do you have any comments about this task or idioms in general?

Thank you for your help!
Appendix I: New Idiom Comprehension Measure
Idiom Comprehension Measure: Form A

Number: _________
Date: ___________

Words and phrases can have several meanings. Read these phrases and circle the answer that means the same. Some phrases will be in a short story, and some will be alone. There is only one answer for each question.

Familiar: Transparent: Out of Context

1. Hold your head up
   a) To prop your head up with your hand
   b) To be brave and/or proud
   c) To be angry and/or upset

2. Take someone under your wing
   a) To give someone your seat on a plane
   b) To offer someone guidance
   c) To teach someone to fly

3. Right under my nose
   a) To find in an obvious, nearby place
   b) To treat someone unfair, or unkind
   c) To have a thin mustache under your nose
4. Cry over spilled milk
   a) To cry because the milk was split on the floor
   b) To cry over something that has already happened
   c) To complain about someone’s cooking

5. Hold your tongue
   a) To tell a lie
   b) To pinch your tongue between your fingers
   c) To keep quiet
Familiar: Opaque: Out of Context

1. Bring the house down
   d) To make others applaud a spectacular performance
   e) To make a room full of people angry
   f) To tear down a house with a bulldozer

2. Paint the town red
   d) To make everyone mad in town
   e) To go out and celebrate
   f) To paint a big city, like New York, red

3. Chip off the old block
   a) To act or look like your parent(s)
   b) To live on the same block as your family
   c) To save a piece of brick from a house’s foundation

4. At the drop of a hat
   a) To do as soon as it is convenient
   b) To change into a uniform with a hat
   c) To do something immediately, without pressure

5. Jump through hoops
   a) To be in the circus
b) To do whatever you are told

c) To be a good athlete
Familiar: Transparent: In Context

1. Go by the book

Officer Knack is a nice guy, but he never lets a criminal get away with a crime. He goes by the book.

a) To admire a novel’s character
b) To read a lot
c) To follow the rules

2. Blow off steam

Alex had had a difficult week at work. He could not wait to blow off steam once Friday night arrived.

a) To get rid of stress
b) To ignore a pot of boiling water
c) To ride a steam boat

3. Keep a straight face

Barbara was an experienced practical joker, but after seeing Jane’s face it was hard to keep a straight face.

a) To laugh in someone’s face
b) To have plastic surgery on your face
c) To not smile

4. Take a shot in the dark

Steve did not have time to study for his exam. For the essay question he took a shot in the dark.

a) To shoot a gun at night
b) To be worse than expected

c) To take a guess

5. The early bird catches the worm

Martha packed her briefcase the night before her interview. She was prepared because she knew that *the early bird catches the worm.*

a) The one who arrives early will be successful

b) Worms are only available in the morning

c) The one who can keep a secret is trustworthy
Familiar: Opaque: In Context

1. Have a soft spot in your heart

Even though Jasmine was allergic to cats, she **had a soft spot in her heart** for the orange and black stray, and always let her in for a dish of milk.

   a) To have a pain in your heart
   b) To have a heart murmur
   c) To be fond of something or someone

2. Spill the beans

Sandra felt so guilty about what she had done to her little brother that she eventually **spilled the beans** about how his game boy got broken.

   a) To lie to someone
   b) To tell a secret
   c) To drop a pot of freshly cooked beans

3. Wet behind the ears

Jack watched his new teammates do the butterfly back and forth in the swimming pool. He longed to be that good, but right now he was new to the team and a little **wet behind the ears**.

   a) To be inexperienced
   b) To be a good swimmer
   c) To comb your hair back behind your ears

4. Go cold turkey

John had tried to quit smoking many times. This time he was not going to gradually stop smoking though, he was going to **go cold turkey**.
a) To not heat up the turkey
b) To know something really well
c) To stop an addictive behavior immediately

5. To flip your lid

Tyron’s parents were away for the weekend. He had promised not to invite anyone over to the house while they were gone. When his parents returned to see the house in shambles from a party, they *flipped their lids.*

a) To open the hood
b) To be ecstatic
c) To be very angry
Unfamiliar Idioms: Transparent: Out of Context

1. To shoot sparrows with cannons
   a) To defeat the enemy without exhausting yourself
   b) To use excessive means to fulfill an objective
   c) To kill many birds at once

2. To put on the sails
   a) To take a trip by sea
   b) To hit a snag
   c) To leave

3. To try to make a hole in water
   a) To dive into the water
   b) To make a good impression
   c) To try to do something that is impossible

4. To fall down with four horseshoes up in the air
   a) To be embarrassed
   b) To fall flat on your back
   c) To fall down while playing horseshoes

5. To cut a pear in two
   a) To split a snack
   b) To meet in the middle
c) To argue about something small
Unfamiliar Idioms: Opaque: Out of Context

1. To eat the leaf
   a) To be a vegetarian
   b) To be late to work
   c) To keep a secret

2. To be at the green
   a) To be out of money
   b) To be a novice
   c) To be at the golf course

3. To whistle in your thumb
   a) To be quiet
   b) To avoid talking about something
   c) To be unable to get what you want

4. To pick up a log
   a) To fall down and hurt yourself
   b) To hurry up
   c) To gather wood for a fire

5. To play the donkey to get bran
   a) To play a child’s game
b) To play dumb

c) To get on someone’s nerves
Unfamiliar: Transparent In Context

1. To run around like scalded pigs

The twins had waited until the day of the party to buy all the refreshments and
decorations. At 6pm, an hour before the party, they were running around like scalded
pigs.

a) To rush about crazily

b) To be even worse than anticipated

c) To squeal a lot

2. For a good hunger there is no hard bread

Jason had been hiking all day, and had forgotten to pack his lunch with him. By the time
he made it home he was starving. His mother said that all she was making for dinner was
leftovers. Jason told her that for a good hunger there is no hard bread.

a) Hard bread is better when you are starving

b) To bore someone

c) Anything tastes good when you are hungry

3. To hold someone’s leg

Jill has a reputation for talking about her pet birds obsessively. When Terry was finally
able to walk away from Jill at the party, she told Matt, “Jill really knows how to hold
someone’s leg.”

a) To wait a while

b) To bore someone with endless conversation

c) To make someone fall down

4. To be a monkey on a branch
Sam’s friend, John, had talked Sam into moving away from his small hometown to New York City to room with him. John always talked about how wonderful it was to live there. Sam moved there, but hated it. He could not stand the traffic and the small apartment. He told John, “You grew up in a big city and that is why you are a monkey on the branch!” Sam decided to move back home.

a) To feel at home

b) To exaggerate the situation

c) To act like a monkey

5. To throw flowers to somebody

Rachel respected her teacher, and when someone asked her about Mr. Feder she threw flowers to him.

a) To throw flowers during a parade

b) To speak highly of someone

c) To squander money
Unfamiliar Idioms: Opaque: In Context

1. To pet the horse first

Jacob had not waited for the paint to dry before loading in the furniture. He ruined the new paint job. His mother said, “That’s what happens when you *pet the horse first.*”

   a) To win a bet at the track you have to arrive early
   
   b) Rushing into something leads to mistakes
   
   c) To get up early

2. To have salt in your pumpkin

Ginny had passed all her exams and had gotten onto the honor role. Her teachers and classmates all knew that she *had salt in her pumpkin.*

   a) To make something sour
   
   b) To be intelligent
   
   c) To be arrogant

3. To eat on the thumb

Thomas was in a hurry to get to school and missed breakfast. On the way to the bus he *ate on the thumb.*

   a) To grab a bite to eat
   
   b) To eat small appetizers
   
   c) To eat too much

4. Between dog and wolf

Zoe was supposed to be home before dark. Her parents were pleased when she arrived *between dog and wolf.*

   a) At dusk
b) A dog having wolf characteristics

c) To be cruel

5. To lay a rabbit on someone

Philip waited on Stanley for nearly an hour at the park before he realized that Stanley had laid a rabbit on him.

a) To tell a lie

b) To stand someone up

c) To try to hold on to a fast animal
Idiom Comprehension Measure: Form B

Number: _________
Date: ___________

Words and phrases can have several meanings. Read these phrases and circle the answer that means the same. Some phrases will be in a short story, and some will be alone. There is only one answer for each question.

**Familiar: Transparent: Out of Context**

1. Go by the book
   a) To admire a novel’s character
   b) To read a lot
   c) To follow the rules

2. Blow off steam
   a) To get rid of stress
   b) To ignore a pot of boiling water
   c) To ride a steam boat

3. Keep a straight face
   a) To laugh in someone’s face
   b) To have plastic surgery on your face
c) To not smile

4. Take a shot in the dark
a) To shoot a gun at night
b) To be worse than expected
c) To take a guess

5. The early bird catches the worm
a) The one who arrives early will be successful
b) Worms are only available in the morning
c) The one who can keep a secret is trustworthy
Familiar: Opaque: Out of Context

1. Have a soft spot in your heart
   a) To have a pain in your heart
   b) To have a heart murmur
   c) To be fond of something or someone

2. Spill the beans
   a) To lie to someone
   b) To tell a secret
   c) To drop a pot of freshly cooked beans

3. Wet behind the ears
   a) To be inexperienced
   b) To be a good swimmer
   c) To comb your hair back behind your ears

4. Go cold turkey
   a) To not heat up the turkey
   b) To know something really well
   c) To stop an addictive behavior immediately

5. To flip your lid
   a) To open the hood
   b) To be ecstatic
c) To be very angry
Familiar: Transparent: In Context

1. Hold your head up

After Judy’s teacher notices her cheating on an exam, Judy finds it hard to hold her head up.

a) To prop your head up with your hand
b) To be brave and/or proud
c) To be angry and/or upset

2. Take someone under your wing

The more experienced pilot taught the newcomer, Jerry, how to fly the jet. He took Jerry under his wing.

a) To give someone your seat on a plane
b) To offer someone guidance
c) To teach someone to fly

3. Right under my nose

Steve trusted all of his family and friends. That’s why it was so hard to accept that the thief was right under his nose.

a) To find in an obvious, nearby place
b) To treat someone unfair, or unkind
c) To have a thin mustache under your nose

4. Cry over spilled milk

Reece had spent her last dime on ingredients for her and Lindsey’s dinner. But when Lindsey accidentally knocked the pot of soup onto the floor and began to weep, Reece said, “There is no use crying over spilt milk”.

a) To cry because the milk was split on the floor
b) To cry over something that has already happened and cannot be reversed
c) To complain about someone’s cooking

5. Hold your tongue

Chad knew that Bob had taken Sue’s bike. But, when Sue asked Chad and Bob who took it, Chad held his tongue.

a) To tell a lie
b) To pinch your tongue between your fingers
c) To keep quiet
Familiar: Opaque: In Context

1. Bring the house down

Sara had practiced her trumpet solo for a whole month. When her band finally played in the club, she blew her trumpet with so much enthusiasm that she *brought the house down*.

   a) To make others applaud a spectacular performance
   b) To make a room full of people angry
   c) To tear down a house with a bulldozer

2. Paint the town red

Bobby just graduated from New York University. To celebrate he and his friends went out and *painted the town red*.

   a) To make everyone mad in town
   b) To go out and celebrate
   c) To paint a big city, like New York, red

3. Chip off the old block

Jose was a hard worker who had already been successful in his career and bought a home by age 25. His family and neighbors said that he was a *chip off the old block*.

   a) To act or look like your parent(s)
   b) To live on the same block as your family
   c) To save a piece of brick from a house’s foundation

4. At the drop of a hat

Xavier really admired his grandmother. Anytime she would ask him to come visit he would do so *at the drop of a hat*. 
a) To do as soon as it is convenient

b) To change into a uniform with a hat

c) To do something immediately, without pressure

5. Jump through hoops

Nancy wanted to be a part of the group more than anything. For this reason, she was willing to *jump through hoops* to be accepted.

a) To be in the circus

b) To do whatever you are told

c) To be a good athlete
Unfamiliar Idioms: Transparent: Out of Context

1. To run around like scalded pigs
   a) To rush about crazily
   b) To be even worse than anticipated
   c) To squeal a lot

2. For a good hunger there is no hard bread
   a) Hard bread is better when you are starving
   b) To bore someone
   c) Anything tastes good when you are hungry

3. To hold someone’s leg
   a) To wait a while
   b) To bore someone with endless conversation
   c) To make someone fall down

4. To be a monkey on a branch
   a) To feel at home
   b) To exaggerate the situation
   c) To act like a monkey

5. To throw flowers to somebody
   a) To throw flowers during a parade
   b) To speak highly of someone
c) To squander money
1. To pet the horse first
   a) To win a bet at the track you have to arrive early
   b) Rushing into something leads to mistakes
   c) To get up early

2. To have salt in your pumpkin
   a) To make something sour
   b) To be intelligent
   c) To be arrogant

3. To eat on the thumb
   a) To grab a bite to eat
   b) To eat small appetizers
   c) To eat too much

4. Between dog and wolf
   a) At dusk
   b) A dog having wolf characteristics
   c) To be cruel

5. To lay a rabbit on someone
   a) To tell a lie
   b) To stand someone up
c) To try to hold on to a fast animal
Unfamiliar: Transparent In Context

1. To shoot sparrows with cannons

Matt wanted to win the contest more than anything. He put up posters urging his peers to vote for him, promised prizes to those who did, and rented a bullhorn to remind people to vote for him the next day. Some people voted for him, but some thought that he was shooting sparrows with cannons.

   a) To defeat the enemy without exhausting oneself
   b) To use excessive means to fulfill an objective
   c) To kill many birds at once

2. To put on the sails

Casey had planned to see the new movie at the theater all week. Her favorite actors were all in it. But, when she arrived on Saturday an hour before show time and saw the long line wrapped all the way around the building and down the street, she put on the sails and decided to try again another day.

   a) To take a trip by sea
   b) To hit a snag
   c) To leave

3. To try to make a hole in water

Jeremy only had $2.35 dollars to spend. When he continued to believe that he could buy a train ticket and have enough money for lunch, his friends told him that he was trying to make a hole out of water.

   a) To dive into the water
   b) To make a good impression
   c) To try to do something that is impossible

4. To fall down with four horseshoes up in the air
Sean tried to run home to get out of the cold, but there was a big patch of ice on the pavement and he *fell down with four horseshoes up in the air.*

a) To be embarrassed  
b) To fall flat on your back  
c) To fall down while playing horseshoes

5. To cut a pear in two

Jimmy wanted to go to the mall, but Sydney wanted to go to the movies. They decided *to cut a pear in two* and do both.

a) To split a snack  
b) To meet in the middle  
c) To argue about something small
Unfamiliar Idioms: Opaque: In Context

1. To eat the leaf
Sandy told Gina not to tell anyone what she had said. Gina promised to eat the leaf.
   a) To be a vegetarian
   b) To be late to work
   c) To keep a secret

2. To be at the green
Lindsey went to the bank and was surprised that she was not able to withdraw any money from the ATM. She did not realize that she was at the green.
   a) To be out of money
   b) To be a novice
   c) To be at the golf course

3. To whistle in your thumb
Leslie wanted a new car more than anything, but without a paycheck she was whistling in her thumb.
   a) To be quiet
   b) To avoid talking about something
   c) To be unable to get what you want

4. To pick up a log
Karen did not realize that the temperature had dropped and the sidewalk had frozen. When she tried to run across the street she picked up a log.
   a) To fall down and hurt oneself
b) To hurry up

c) To gather wood for a fire

5. To play the donkey to get bran

Max was the only one home after school. When his mom came home and asked who had eaten all the cake, Max played the donkey to get bran.

a) To play a child’s game

b) To play dumb

c) To get on someone’s nerves
Appendix J: Polk County Public Schools Approval Letters
January 9, 2005

In regards to: Idiom Comprehension in Bilingual and Monolingual Adolescents

Mr. Morgan Platt
Supervisor, Research and Evaluation
Polk County Schools
1915 S Floral Avenue
Bartow, FL 33830

Dear Mr. Platt,

I have obtained permission from Mr. Thomas, the principal of Lakeland Senior High, to begin the second phase of my research study. Mr. Thomas is aware that the start of this research proposal is pending until I receive permission first from the Polk County School System, and then permission from the University of South Florida’s Internal Review Board (IRB). Pending permission from these two entities, Mr. Thomas will allow me to commence Phase 2 of the study beginning in August of 2006, in the most expedient manner, with minimal disruption to his school.

Sincerely,

Belinda Fuste-Herrmann

Mr. Thomas
In regards to: Idiom Comprehension in Bilingual and Monolingual Adolescents

Mr. Morgan Platt
Supervisor, Research and Evaluation
Polk County Schools
1915 S Floral Avenue
Bartow, FL 33830

Dear Mr. Platt,

I have obtained permission from Mr. McClellen, the principal of Kathleen Senior High School, to begin the second phase of my research study. Mr. McClellen is aware that the start of this research proposal is pending until I receive permission first from the Polk County School System, and then permission from the University of South Florida’s Internal Review Board (IRB). Pending permission from these two entities, will allow me to commence Phase 2 of the study beginning in August of 2006, in the most expedient manner, with minimal disruption to his school.

Sincerely,

Belinda Fuste-Herrmann

Mr. McClellen
In regards to: Idiom Comprehension in Bilingual and Monolingual Adolescents

Mr. Morgan Platt  
Supervisor, Research and Evaluation  
Polk County Schools  
1915 S Floral Avenue  
Bartow, FL 33830

Dear Mr. Platt,

I have obtained permission from Mr. Gilchrest, the principal of Lake Gibson Senior High, to begin the second phase of my research study. Mr. Gilchrest is aware that the start of this research proposal is pending until I receive permission first from the Polk County School System, and then permission from the University of South Florida’s Internal Review Board (IRB). Pending permission from these two entities, will allow me to commence Phase 2 of the study beginning in August of 2006, in the most expedient manner, with minimal disruption to school.

Sincerely,

Belinda Fuste-Herrmann

Mr. Gilchrest.
Appendix K: School District of Hillsborough County Approval
Ms. Belinda Fust-Herrmann, M.A.,
4187 Audubon Oak Circle, #301
Lakeland, FL 33809

Dear Ms. Fust-Herrmann:

The Hillsborough County Public School district has agreed to participate in your research proposal, "Idiom Comprehension in Bilinguals and Monolinguals." A copy of this letter should be presented to the principal and participants in order to assure them your research has been approved by the district. **Approval is given, however, under the following conditions:**

1) Participation by the school, its teachers, students, or parents is to be on a voluntary basis. That is, **participation is not** mandatory and you must advise your participants that they are not obligated to participate in your study.

2) Confidentiality must be assured for all participants. That is, all data must be aggregated such that the district cannot be identified as well as any other participant including parents, students, and administrators.

3) Parent permission must be obtained for all students involved in your research. This include both the sample group AND, if you have one, the control group. You must indicate in your letter to the parent all the types of data you will be collecting (i.e., race, gender, FCAT scores, etc.)

4) Student data **MUST** be destroyed when the project has been completed.

**NOTE:**

Your research request indicates that you will be interacting with students. Because of the Jessica Lunsford Act, you are NOT ALLOWED TO COME INTO CONTACT WITH STUDENTS unless you have been fingerprinted. For this purpose, enclosed is a Volunteer Application and Volunteer Fingerprinting Instructions. Please note, you WILL NOT BE ALLOWED CONTACT WITH STUDENTS until you have completed the process outlined in the instructions and you present a "stamped" SERVE application to school personnel.

Please forward one copy of your completed study for our files.

Good luck with your endeavor. If you have any questions, please advise.

Sincerely,

[Signature]

John A. Hilderbrand, Ph.D., Director
Assessment and Accountability

JAH/mt
Appendix L: IRB Approved Consent Forms (English and Spanish)
1. General Information of the Research Study:
Your child is invited to be in a small research study called "Idiom Comprehension in Bilingual and Monolingual Adolescents: Understanding English Idioms like Relating Cats and Dogs". Understanding English idioms like relating cats and dogs may be important to reading comprehension. This study will look at the ability to understand idioms by having your child answer some questions about idioms, and by completing some parts of a reading assessment. This research will help us improve the reading comprehension of all children, those who speak English and those who speak Spanish and English. It is an important aim because of the FCAT that students are required to take and pass in order to graduate. A bilingual/unilingual PhD student in the Department of Communication Sciences and Disorders at the University of South Florida (USF) is conducting this study. Your county's school district and the administrators and teachers at your child's school have allowed us to do this study. We are asking permission to include your child. We hope to have a total of 70 students (35 bilingual adolescents and 35 monolingual adolescents) from high schools in your area participate in the study.

2. Description of the Research Study:
This study will include monolingual (English-speaking) and bilingual (Spanish/English-speaking) adolescents in high schools in your area. Each student will participate individually. The study will consist of a), a few subtiles of a reading comprehension test, b) an idiom test, where students will answer multiple choice questions about what several idioms mean. c) and a short interview for bilingual students about how often they speak Spanish. The study will take approximately 60 to 76 minutes on one occasion, at school and during school hours.

3. Benefits of the Study:
Your child will not directly benefit from the results from this study. However, results will help educators to better understand how idiom comprehension skills of monolingual and bilingual adolescents relate to their reading abilities. This is especially important since there is limited research on reading comprehension and idiom comprehension with adolescents, particularly bilingual adolescents. We hope that this study will benefit both monolingual and bilingual adolescents who are struggling with reading comprehension.

4. Volunteering for the Study:
Your decision to allow your child to participate in this research study is completely voluntary. You are free to allow your child to participate in this research study or to withdraw him/her at any time. If you choose not to allow your child to participate in this research study, there will be no penalty to you or your child. Neither refusal to participate nor the results obtained from the study will in any way affect your child's grades or eligibility for a special program in your school district. You and your child will not be paid or receive special considerations for participation in this study. At the end of the study, five participating students from each participating school will be randomly selected through a raffle to receive a pair of student movie tickets each. There are no known risks to participants.

5. Confidentiality of Your Child's Records:
All data and results from this study will be kept confidential to the extent allowed by the law. Authorized research investigators, agents of the department of Health and Human Services, USF Institutional Review Board, and its staff, and any other individuals acting on behalf of USF, may access all records from this project. While the results of this study may be reported at professional meetings, published in professional journals, or used for training graduate students in Communication Sciences and Disorders, your child's anonymity will be maintained. Each child's individual data will be coded by number without the child's name and school. All data will be kept in a locked language laboratory in the Department of Communication Sciences and Disorders of the University of South Florida. The room also has an electronic security system for additional security.

6. Instructions:
Please read and sign the consent form (provided on the back) and promptly return it to your child's teacher. You may get additional information from Belinda Fusco-Herrmann, the research investigator, at the USF Department of Communication Sciences and Disorders. We would greatly appreciate your help in allowing your child to be part of this important study. If you have any questions, please call Belinda at (813) 813-0446. Once the study is completed, we will be happy to provide a summary of results to any parent or guardian who requests a copy. If you or your child have a question about your child's right as a person who is taking part in a research study, you or your child may contact a member of the Division of Research Compliance of the University of South Florida at (813) 974-6638.

Please Return to Your Classroom Teacher by:

Thank You for Your Help!

Please turn the page over.
Student's Name ____________________________ D.O.B __________

Teacher's Name ____________________________

Your Consent: By signing this form I agree that:
- I have fully read or have had read and explained to me in my native language this informed consent form describing a research project.
- I have had the opportunity to question one of the persons in charge of this research and have received satisfactory answers.
- I understand that I am being asked to allow my child to participate in this study. I understand the risks and benefits, and I freely give my consent to allow my child to participate in the research project outlined in this form, under the conditions indicated on it.

Signature of Parent of Participant       Printed Name of Parent  Date

Student's Assent Statement
The research study called *Idiom Comprehension in Bilinguals and Monolinguals* has been explained to me. I agree to be in this study.

Signature of Student       Printed Name of Student  Date

Signature of Parent       Printed Name of Parent  Date

Signature of Investigator       Printed Name of Investigator  Date

Signature of Witness       Printed Name of Witness  Date

By signing this form I agree that: Participants have been provided with adequate information relative to the study. A phone number has been provided in case of questions.

Signature of Investigator       Printed Name of Investigator  Date

Institutional Approval of Study and Informed Consent
This research project/study and informed consent form were reviewed by the University of South Florida Institution Review Board for the protection of human subjects. This approval is valid until the date provided below. The board may be contacted at (813) 974-5638.

Approval Consent Form Expiration Date: ____________
Revision Date: ________

APPROVED

USF INSTITUTIONAL REVIEW BOARD: FWA00031509

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1. Información General Sobre la Investigación Propuesta

Su hija está invitada a participar en una pequeña investigación escolar titulada "La Comprensión de Modismos en Adolescentes Bilingües y Monolingües". Es posible que la comprensión de modismos en inglés, como saying cats and dogs, sea importante para la comprensión de lectura en inglés. Por eso, esta investigación examinará la habilidad de comprender modismos en inglés a través de algunas preguntas sobre modismos y lectura con su hijo. Esta investigación nos ayudará a aumentar la comprensión de lectura en todos los adolescentes, los que hablen inglés o sean bilingües hablando español e inglés. Esta es una meta importante porque los estudiantes en la Florida tienen que tomar el FCAT para poderles graduarse. Esta investigación está dirigida por una estudiante bilingüe, quien está trabajando hacia su doctorado, en el Departamento de Ciencias y Desordenes de Comunicación de la Universidad de South Florida (USF). El distrito escolar del condado y los administradores y maestros de la escuela de su hija no han permitido hacer esta investigación. Nosotros estamos pidiendo permiso para incluir a su hija. Esperamos poder conseguir 70 estudiantes (35 estudiantes bilingües y 35 estudiantes monolingües) para realizar la escuela en su área para participar en esta investigación.

2. Descripción de la Investigación Escolar

Esta investigación va a incluir adolescentes de las escuelas secundarias en su área. Cada estudiante participa de manera individual. La investigación consistirá en a) una parte de un examen de leer, b) un examen de modismos, en el cual los estudiantes dicen las respuestas en un examen de selección múltiple sobre los significados; y c) una pequeña entrevista sobre la frecuencia que su hija habla español. Esta investigación tomará aproximadamente 60-75 minutos en una ocasión, en la escuela durante las horas de la escuela. En ningún momento saldrá su hijo de la escuela.

3. Beneficios de esta Investigación

Su hijo no beneficiará directamente de esta investigación. Pero, los resultados de esta investigación ayudarán a educadores entender mejor las habilidades de la comprensión de modismos en niños bilingües/monolingües relacionadas a sus habilidades de lectura. Esto es de gran importancia porque ahora sabemos muy poco sobre la comprensión de lectura y de modismos con los adolescentes, específicamente en los adolescentes bilingües. Esperamos que esta investigación sea beneficiosa para los estudiantes monolingües y bilingües quienes están pasando mucho trabajo aprendiendo a leer y comprendiendo la lectura.

4. Ofreciéndose para la Investigación como Voluntario

Su decisión de permitir a su hija participar en esta investigación es completamente voluntaria. Usted tiene la libertad de permitir a su hija participar en este estudio y también de rechazarlo en cualquier momento. Si usted decide no permitirle a su hija participar, o si usted decide rechazar la investigación después, no habrá ninguna penalidad sobre usted o su hija. Ni por decidir no participar, ni los resultados de esta investigación, afectarán de ninguna manera las calificaciones o la elegibilidad para un programa especial en el condado de su distrito escolar para su hija. Ni su hijo ni su hijo serán pagados ni recibirán consideraciones especiales por participar en esta investigación. Cincuenta estudiantes en cada escuela van a tener una oportunidad para ganar dos boletos a la película en una rifa. No hay ningún peligro el riesgo para participantes.

5. Confidencialidad de los Datos de su Hijos

Todos los datos y resultados de esta investigación se mantendrán confidenciales hasta cierto punto de la ley. Personas autorizadas en este proyecto, emplazadas en el Departamento de Salud y Servicios Humanos, y ajenas directivas que revisa proyectos institucionales relacionados con la universidad y sus empleados, además de otros ampliamente funcionando como directivos de la universidad, podrán inspeccionar los documentos de este proyecto. Los resultados pueden ser reportados en reuniones profesionales, publicados en revistas profesionales o se pueden usar para enseñar a estudiantes en Comunicación Ciencias y Desordenes pero el anonimato de su hijo va a ser mantenido. La identidad de su hijo será mantenido anónimo en todo caso. Los datos de cada estudiante estarán asignados un código sin incluir el nombre de su hijo ni el nombre de la escuela. Todos los datos estarán manteniendo en el laboratorio de lenguaje cerrado en el Departamento de Comunicación Ciencias y Desordenes en USF. El cuarto también tiene un sistema electrónico de seguridad para seguridad adicional.

6. Instrucciones:

Por favor lea y firme el formulario de permiso (en la próxima página) y regreselo al maestro de su hijo/a lo antes posible. Si requiere información adicional o tiene preguntas sobre la investigación, por favor póngase en contacto con Belinda Fusté-Herrmann en el Departamento de Comunicación Ciencias y Desordenes de USF al (908) 816-0446. Nosotros le agradeceremos su ayuda en permitiendo que su hija participe en esta investigación tan importante. Cuando se termine la investigación, nosotros, con mucho gusto, le enviamos un resumen de los resultados a cualquier padre o guardia que lo pida. Si el hijo o su hija tiene una pregunta sobre los derechos de su hijo como participante en una investigación escolar, usted o su hija pueden ponerse en contacto con un miembro de la Junta de Investigación y Sacramentos de la Universidad de South Florida al (908) 374-5688.

4. IRB Approval

IRB Number: 1951R0
From: 11/07/07
Thru: 12/19/07

5. Confidencialidad de los Datos de su Hijos

Todos los datos y resultados de esta investigación se mantendrán confidenciales hasta cierto punto de la ley. Personas autorizadas en este proyecto, emplazadas en el Departamento de Salud y Servicios Humanos, y ajenas directivas que revisa proyectos institucionales relacionados con la universidad y sus empleados, además de otros ampliamente funcionando como directivos de la universidad, podrán inspeccionar los documentos de este proyecto. Los resultados pueden ser reportados en reuniones profesionales, publicados en revistas profesionales o se pueden usar para enseñar a estudiantes en Comunicación Ciencias y Desordenes pero el anonimato de su hijo va a ser mantenido. La identidad de su hijo será mantenido anónimo en todo caso. Los datos de cada estudiante estarán asignados un código sin incluir el nombre de su hijo ni el nombre de la escuela. Todos los datos estarán manteniendo en el laboratorio de lenguaje cerrado en el Departamento de Comunicación Ciencias y Desordenes en USF. El cuarto también tiene un sistema electrónico de seguridad para seguridad adicional.

6. Instrucciones:

Por favor lea y firme el formulario de permiso (en la próxima página) y regreselo al maestro de su hijo/a lo antes posible. Si requiere información adicional o tiene preguntas sobre la investigación, por favor póngase en contacto con Belinda Fusté-Herrmann en el Departamento de Comunicación Ciencias y Desordenes de USF al (908) 816-0446. Nosotros le agradeceremos su ayuda en permitiendo que su hija participe en esta investigación tan importante. Cuando se termine la investigación, nosotros, con mucho gusto, le enviamos un resumen de los resultados a cualquier padre o guardia que lo pida. Si el hijo o su hija tiene una pregunta sobre los derechos de su hijo como participante en una investigación escolar, usted o su hija pueden ponerse en contacto con un miembro de la Junta de Investigación y Sacramentos de la Universidad de South Florida al (908) 374-5688.

Por favor, devuelva al maestro/a antes de:

Gracias Por Su Ayuda

Por favor, alce a la próxima página.
El Nombre del Estudiante ___________________________ Fecha del Nacimiento _______

Nombre de Maestro/a ___________________________

Su Permiso: Por firmar este formulario, estoy de acuerdo que:
• He leído completamente, o otra persona lo leyó y me lo explicó en mi idioma nativo, este formulario de permiso que está describiendo esta investigación.
• He tenido la oportunidad de preguntar algunas de las personas que están encargado de esta investigación sobre el proyecto y he recibido respuestas satisfactorias.
• Entiendo que me están pidiendo que permita a mi hijo/a participar en esta investigación.
Entiendo que no hay riesgos ni beneficios, y libremente doy mi permiso para permitir que mi hijo/a a participe en esta investigación como describe en este formulario, en las condiciones indicadas aquí.

Firma del Padre(s) del Participante Nombre del Padre(s) Fecha

La declaración del asentimiento del niño/a
La investigación llamada La Comprensión del Modismos en Bilingües y Monolingües ha sido explicada a mí. Estoy de acuerdo con participar en esta investigación.

Firma del Estudiante Nombre del Estudiante Fecha

Firma del Padre(s) Nombre del Padre(s) Fecha

Firma del Investigador Nombre del Investigador Fecha

Firma del Testigo Nombre del Testigo Fecha

En firmar este formulario yo accedo a: Le he provisto a los participantes la información adecuada relativa a la investigación. También se le ha provisto un número de teléfono en caso de preguntas.

Firma del Investigador Nombre de Investigador Fecha

Institutional Approval of Study and Informed Consent
Esta investigación y esta declaración del consentimiento han examinado por el University of South Florida Institution Review Board para la protección de los participantes humanos. Esta aprobación está válida estipulado abajo. Usted puede hacer contacto con esta organización en este número: (813) 974-5638.

Approval Consent Form Expiration Date: ______________
Revision Date: ______________
Appendix M: Student Assent Form
Assent to Participate in Research
University of South Florida
Information for Individuals under the Age of 18 Who Are Being Asked To Take Part in Research Studies

Idiom Comprehension in Bilingual and Monolingual Adolescents

WHY AM I BEING ASKED TO TAKE PART IN THIS RESEARCH?
You are being asked to take part in a research study about reading comprehension in monolingual and bilingual high school students. You are being asked to take part in this research study because you are either an English-only speaker or an English-Spanish speaker in high school. If you take part in this study, you will be one of about 70 people in this study.

WHO IS DOING THE STUDY?
The person in charge of this study is Belinda Fusté-Hermann of the Department of Communication Sciences (CSD) at the University of South Florida in Tampa. I am being guided in this research by my advisor, Dr. Elaine R. Silliman.

WHAT IS THE PURPOSE OF THIS STUDY?
By doing this study, we hope to learn more about how students your age comprehend different types of reading passages.

WHERE IS THE STUDY GOING TO TAKE PLACE AND HOW LONG WILL IT LAST?
The study will be take place in Polk County and/or Hillsborough County Public High Schools. The study will be conducted in your school during school hours; and you will be asked to meet with me only once. This visit will take about one hour to one hour and fifteen minutes, which is the total amount of time you will be asked to volunteer for this study.

WHAT WILL I BE ASKED TO DO?
You will be asked to participate in five tasks. During the first task you will be asked to read some nonsense words aloud. Next, you will read several sentences and passages silently and fill in missing words aloud. During the third task you will be asked to answer some multiple choice questions about story phrases. During the fourth task, I will tell you some words and you will tell me their synonyms, or words that mean the same as those words. During the fifth task, you will read a short passage and find some errors in it. All five of these activities are very similar to assignments you might complete in class. Finally, if you are bilingual, I will ask you some questions about when you learned each language and how often you use each language.

<table>
<thead>
<tr>
<th>Task 1</th>
<th>Task 2</th>
<th>Task 3</th>
<th>Task 4</th>
<th>Task 5</th>
<th>Task 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading nonsense words aloud</td>
<td>Reading and filling in missing words</td>
<td>Answering multiple choice questions</td>
<td>Giving synonyms for several vocabulary words</td>
<td>Finding errors in a short story</td>
<td>If you are bilingual: Answering some questions about your language use</td>
</tr>
</tbody>
</table>

WHAT THINGS MIGHT HAPPEN THAT ARE NOT PLEASANT?
To the best of our knowledge, the things you will be doing will not harm you or cause you any additional unpleasant experience.

IRB Approval
FWA 0001669

IRB Number: 105180
From 11/10/67
Thru 12/14/67
WILL SOMETHING GOOD HAPPEN IF I TAKE PART IN THIS STUDY?
We cannot promise you that anything good will happen if you decide to take part in this study. Hopefully, what we learn from this study will help teenagers who are struggling with reading in the future.

DO I HAVE TO TAKE PART IN THE STUDY?
You should talk with your parents or anyone else that you trust about taking part in this study. If you do not want to take part in the study, that is your decision. You should take part in this study because you really want to volunteer.

IF I DON'T WANT TO TAKE PART IN THE STUDY, WHAT WILL HAPPEN?
If you do not want to take part in the study, you are welcome to return to your classroom. There will be no effects on your grades if you do or do not decide to volunteer for this study. This is completely voluntary. If you do not want to be a part of this study, nothing else will happen.

WILL I RECEIVE ANY REWARDS FOR TAKING PART IN THE STUDY?
You will receive a chance to win two student movie tickets for taking part in this study. Five people from your school who volunteer for this study will each win two of these tickets.

WHO WILL SEE THE INFORMATION I GIVE?
Your information will be added to the information from other people taking part in the study so no one will know who you are. A number will be written on your papers instead of your name.

CAN I CHANGE MY MIND AND QUIT?
If you decide to take part in the study you still have the right to change your mind later. No one will think badly of you if you decide to quit. Also, I may need for you to stop. If this happens, I will tell you why.

WHAT IF I HAVE QUESTIONS?
You can ask questions about this study at any time. You can talk with your parents or other adults that you trust about this study. You can talk with the person who is asking you to volunteer. If you think of other questions later, you can ask them.

Assent to Participate
I understand what the person running this study is asking me to do. I have thought about this and agree to take part in this study.

Name of person agreeing to take part in the study                      Date

Name of person providing information to subject                         Date

APPROVED
USF INSTITUTIONAL REVIEW BOARD (FWA0001669)
## Inclusion Questionnaire

Participant Number: _______  Date of Birth: _______  Grade Level: _______
Date of Study: _______

<table>
<thead>
<tr>
<th>Criteria Checklist</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you have normal or aided hearing?</td>
<td></td>
</tr>
<tr>
<td>Do you have normal or corrected vision?</td>
<td></td>
</tr>
<tr>
<td>Are you receiving or are you eligible for speech and language services?</td>
<td></td>
</tr>
<tr>
<td>Do you only speak English?</td>
<td></td>
</tr>
<tr>
<td>Are you of Hispanic descent and/or speak Spanish?</td>
<td></td>
</tr>
</tbody>
</table>

WJ-III Nonword Subtest Score: ________________
Appendix O: Student Language History Questionnaire
Bilingual Language History Questionnaire

Student’s Name: ________________  Date: _________________

1. When did you first begin to learn English?

2. When did you first begin to learn Spanish?

3. Were you born in the United States?

4. If not, where were you born?

5. Have you ever attended school in Spanish?

6. If you were born outside of the U.S.: What was the last grade completed in your native country?

7. How many years have you lived in the United States?

8. What languages do you:

   Speak: ________________

   Understand: ________________

   Read: ________________

   Write: ________________
# Language Proficiency Rating Scale

Participant #__________

Please read each statement carefully and circle the number/word that best describes your answer. If the question does not apply to you, please circle the number of the question.

1. My mother/guardian speaks Spanish.

<table>
<thead>
<tr>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Mostly</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

2. I speak to my mother/guardian in Spanish.

<table>
<thead>
<tr>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Mostly</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

3. My father/guardian speaks Spanish.

<table>
<thead>
<tr>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Mostly</th>
<th>Always</th>
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<tr>
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<td>1</td>
<td>2</td>
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</tbody>
</table>

4. I speak to my father/guardian in Spanish.

<table>
<thead>
<tr>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Mostly</th>
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<tr>
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<td>1</td>
<td>2</td>
<td>3</td>
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<td>5</td>
</tr>
</tbody>
</table>
5. My brother(s)/sister(s) speak(s) Spanish.

0     1     2     3     4     5
Never  Rarely  Sometimes  Often  Mostly  Always

6. I speak Spanish to my brother(s)/sister(s).

0     1     2     3     4     5
Never  Rarely  Sometimes  Often  Mostly  Always

7. Most of my family members speak Spanish.

0     1     2     3     4     5
Never  Rarely  Sometimes  Often  Mostly  Always

8. I speak to most of my family members in Spanish.

0     1     2     3     4     5
Never  Rarely  Sometimes  Often  Mostly  Always

9. My neighbors speak Spanish.

0     1     2     3     4     5
Never  Rarely  Sometimes  Often  Mostly  Always

10. I speak to my neighbors in Spanish.

0     1     2     3     4     5
Never  Rarely  Sometimes  Often  Mostly  Always
11. My friends speak Spanish to me outside of school or on the phone.

<table>
<thead>
<tr>
<th></th>
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<th>1</th>
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<tr>
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<td>Rarely</td>
<td>Sometimes</td>
<td>Often</td>
<td>Mostly</td>
<td>Always</td>
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</table>

12. I speak to my friends in Spanish outside of school or on the phone.

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<tr>
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<td>Never</td>
<td>Rarely</td>
<td>Sometimes</td>
<td>Often</td>
<td>Mostly</td>
<td>Always</td>
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</table>

13. I speak Spanish at school.

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<td>Often</td>
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</table>

15. My family watches television in Spanish.

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<td>Often</td>
<td>Mostly</td>
<td>Always</td>
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</table>
16. I read in Spanish.

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<tr>
<td></td>
<td>Never</td>
<td>Rarely</td>
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<td>Often</td>
<td>Mostly</td>
<td>Always</td>
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</table>

17. I write in Spanish.

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<td>Sometimes</td>
<td>Often</td>
<td>Mostly</td>
<td>Always</td>
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</table>

18. I listen to music sung in Spanish.

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<td>Rarely</td>
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<td>Sometimes</td>
<td>Often</td>
<td>Mostly</td>
<td>Always</td>
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</tbody>
</table>

20. People email/text message/instant message me in Spanish.

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<th>4</th>
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<tbody>
<tr>
<td></td>
<td>Never</td>
<td>Rarely</td>
<td>Sometimes</td>
<td>Often</td>
<td>Mostly</td>
<td>Always</td>
</tr>
</tbody>
</table>
Appendix P: Error Detection Paradigm
Participant Number: ________

You will read five factual, short stories. Each story is about something different like an animal or a place. Your job is to look for errors in the stories. Some sentences in these stories may have errors and some may not. Some examples of errors are misspellings, incorrect verbs, and ideas that do not make sense with the rest of the story. For example, look at the errors underlined below:

To make a peanut butter and jelly sandwich you need bread, peanut butter, and jelly. You will also need a nife to spread the peanut butter and jelly, as well as to kut the cake in two. Some people also prefer the crusts to be cut off. Either way, peanut butter and jelly sandwiches are messy, so you will not need a napkin. Peanut butter and jelly sandwiches is very popular.

There are two misspelled words underlined: kut/cut and nife/knife. Also, there are two examples of ideas that do not go with the rest of the story. The story is about making a peanut butter and jelly sandwich, so cutting a cake does not fit with the story’s main idea. The next error is the word not. The reading first says that peanut butter and jelly sandwiches are messy, so it should say that you will need a napkin instead of saying you will not need a napkin. The last error is should say are, since sandwiches is in the plural form, meaning more than one.

Now it is your turn to find these types of errors in each of the five stories below. After reading every one or two sentences in each story you will be asked if there is an error and, if there is, to underline it. Remember that not all of the sentences will have an error.
**Turkeys**

1. A turkey raised for food weighs twice as much as a wild turkey. Wild turkeys can fly, but turkeys raised for food are too light to fly.

   *Is there an error in the above sentences? If so, please underline it.*

2. Wild turkeys eat food such as acorns, seeds, insects, and berries.

   *Is there an error in the above sentence? If so, please underline it.*

3. A female turkey lays about 18 eggs at a time and chicks hatch in one month.

   *Is there an error in the above sentence? If so, please underline it.*

4. The skin on a wild turkey's throat can change color. It changes from gray to shades of red, white, and blue when the turkey is in danger.

   *Is there an error in the above sentences? If so, please underline it.*
Greece

1. The country of Greece is about the size of the state of Alabama.

Is there an error in the above sentence? If so, please underline it.

2. In spite of its small size, Greece has about 8,500 miles of coastline.

Is there an error in the above sentence? If so, please underline it.

3. The United States, which is tiny when compared to Greece, has 12,300 miles of coastline.

Is there an error in the above sentence? If so, please underline it.

4. Greece have a lot of coastline because it has more than 3,000 islands.

Is there an error in the above sentence? If so, please underline it.
Flamingos

1. Flamingos build a nest by making piles of mud. The mother and father flamingo take turns sitting on the mother's egg.

   Is there an error in the above sentences? If so, please underline it.

2. A flamingo's color comes from the shrimp and other creatures it eats. A flamingo can look for food in deep water because its legs are so short.

   Is there an error in the above sentences? If so, please underline it.

3. Flamingos eat by sucking up water and mud. They pump the water and mud out of their bills and trap small water creatures inside their mouths.

   Is there an error in the above sentences? If so, please underline it.

4. Flamingos must run a few step to gain the speed they need to fly.

   Is there an error in the above sentence? If so, please underline it.
Deserts

1. Deserts can be dry places, but no desert is as wet as the Atacama Desert in northern Chile.

Is there an error in the above sentence? If so, please underline it.

2. Parts of this desert will not see a single drop of rain this year.

Is there an error in the above sentence? If so, please underline it.

3. At one time, Arica, the largest city in northern Chile, did not see rain for 14 years.

Is there an error in the above sentence? If so, please underline it.

4. As a matter of fact, some parts of this desert have not seen rain in 400 years! Did you have an idea that any place on Earth could be that dry?

Is there an error in the above sentences? If so, please underline it.
Cheetahs

1. The cheetah is the world's fastest land animal. It can reach speeds of 70 miles an hour in just 3 seconds.

   **Is there an error in the above sentences? If so, please underline it.**

2. You can tell a cheetah from a leopard by looking at its face. Cheetahs have black lines that run from their eyes to their mouths. But it is hard to catch a glimpse of them since cheetahs are so slow.

   **Is there an error in the above sentences? If so, please underline it.**

3. Cheetahs feed on animals such as deer, rabbits, birds, and lizards. Sometimes they eat fruit like watermelon.

   **Is there an error in the above sentences? If so, please underline it.**

4. In the wild, most cheetahs live only 10 to 15 years.

   **Is there an error in the above sentence? If so, please underline it.**
Appendix Q: Percentage of Item Accuracy on the Synonym Task
<table>
<thead>
<tr>
<th>Item</th>
<th>Bilinguals</th>
<th>Monolinguals</th>
<th>Both Groups Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td>Puppy</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Hop</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Small</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Pal</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Ill</td>
<td>94%</td>
<td>100%</td>
<td>97%</td>
</tr>
<tr>
<td>Lady</td>
<td>94%</td>
<td>90%</td>
<td>97%</td>
</tr>
<tr>
<td>Repair</td>
<td>94%</td>
<td>100%</td>
<td>97%</td>
</tr>
<tr>
<td>Difficult</td>
<td>97%</td>
<td>100%</td>
<td>98.5%</td>
</tr>
<tr>
<td>Exhausted</td>
<td>100%</td>
<td>97%</td>
<td>98.5%</td>
</tr>
<tr>
<td>Hit</td>
<td>65%</td>
<td>77%</td>
<td>71%</td>
</tr>
<tr>
<td>Final</td>
<td>94%</td>
<td>94%</td>
<td>94%</td>
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<tr>
<td>Entire</td>
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<td>97%</td>
<td>98.5%</td>
</tr>
<tr>
<td>Amusing</td>
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<td>71%</td>
<td>55%</td>
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<tr>
<td>Blaze</td>
<td>39%</td>
<td>65%</td>
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<tr>
<td>Restrain</td>
<td>55%</td>
<td>81%</td>
<td>68%</td>
</tr>
<tr>
<td>Incinerate</td>
<td>29%</td>
<td>55%</td>
<td>42%</td>
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<tr>
<td>Haul</td>
<td>45%</td>
<td>77%</td>
<td>61%</td>
</tr>
<tr>
<td>Consume</td>
<td>61%</td>
<td>77%</td>
<td>69%</td>
</tr>
<tr>
<td>Residence</td>
<td>35%</td>
<td>71%</td>
<td>53%</td>
</tr>
<tr>
<td>Tarry</td>
<td>3%</td>
<td>13%</td>
<td>8%</td>
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<tr>
<td>Stratagem</td>
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</table>
(Appendix Q continued)

<table>
<thead>
<tr>
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<td>6%</td>
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<tr>
<td>Capacious</td>
<td>10%</td>
<td>6%</td>
<td>8%</td>
</tr>
<tr>
<td>Upbraid</td>
<td>0%</td>
<td>3%</td>
<td>1.5%</td>
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<tr>
<td>Fallow</td>
<td>0%</td>
<td>3%</td>
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<tr>
<td>Evanescent</td>
<td>0%</td>
<td>3%</td>
<td>1.5%</td>
</tr>
</tbody>
</table>
Appendix R: Non-significant ANOVA and \( t \)-test Findings
Non-significant ANOVA and t-test Findings

Age Differences: observed $t(1, 60) = 0.9311$, $p = .64$

Group Differences in Literal: ($F(1, 60) = 3.229$, MSE = 11.758, $p = .077$)

Figurative Responses: ($F(1, 60) = 2.324$, MSE = 10.081, $p = .133$)
Footnote

1 Caution was used in interpreting partial eta squared as a measure of effect size since, unlike classical eta, partial eta holds other variables constant while measuring the strength of the variable of interest. This procedure can inflate effect sizes, making them appear larger than they actually are (Pierce, Block, & Aguinis, 2004). Bedore, Peña, García, and Cortez (2005) cite that one benefit of partial eta is that it is independent of the magnitude or number of other effects. Presently, guidelines for interpreting partial eta squared are absent from the literature (Bedore et al., 2005); however, Peña, Bedore, and Rappazzo (2003) adopted guidelines derived from correlation analyses. According to these guidelines, effect sizes between .80 – 1.00 are considered very large; effect sizes between .50 - .80 are considered large; effect sizes between .25 - .50 are considered moderate; effect sizes between .10 - .25 are considered small; and effect sizes less than .10 are considered negligible (Bedore et al., 2005; Peña et al., 2003).
About the Author

Belinda Fusté-Herrmann received a Bachelor’s Degree in Spanish from Appalachian State University in 1997 and a Master of Art’s Degree in Speech-Language Pathology from The University of North Carolina at Greensboro in 2001. She practiced speech-language pathology for two years before beginning the Ph.D. program in the Department of Communication Sciences and Disorders at the University of South Florida, Tampa.

While in the Ph.D. program at the University of South Florida, Ms. Fusté-Herrmann taught undergraduate and graduate courses including Phonology, Multiculturalism, and Language Learning in the School Age Years; and supervised speech-language pathology graduate students during their Diagnostic Practicum. She has presented at annual state and national American Speech, Language, & Hearing Association (ASHA) conventions in 2003, 2004, and 2006. Ms. Fusté-Herrmann was first author of a publication in a 2006 Learning Disabilities Research & Practice and was awarded the Latino Graduate Fellowship from 2004 to 2007.