EFFECTS OF A CULTURALLY RELEVANT PEER-DELIVERED COMPUTER-ASSISTED INTERVENTION ON ACADEMIC VOCABULARY ACQUISITION AND GENERALIZATION OF LATINO ENGLISH LEARNERS WITH DISABILITIES

by

Adrienne Leigh Anderson

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Approved by:

_____
Dr. Ya-yu Lo

_____
Dr. Charles L. Wood

_____
Dr. Vivian I. Correa

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Dr. Lindsay J. Flynn

_____
Dr. Spencer Salas

ABSTRACT

ADRIENNE LEIGH ANDERSON. Effects of a culturally relevant peer-delivered computer-assisted intervention on academic vocabulary acquisition and generalization of Latino English learners with disabilities. (Under direction of DR. YA-YU LO)

A multiple probe across participants design was used to examine the effects of a culturally relevant peer-delivered computer-assisted vocabulary instruction on the academic vocabulary acquisition and generalization of Latino English learners with disabilities. In addition, a simultaneous treatment design was used to compare generalization of vocabulary acquisition on culturally relevant and non-culturally relevant grade level passages. Six elementary aged Latino students with learning disabilities participated in this study. Using a reciprocal peer tutoring format, each participant was trained and served as both tutor and tutee during the intervention phase of this study. The vocabulary intervention consisted of 12 lessons across six instructional units of 10 words taught during each instructional session. During each lesson, the tutor used Microsoft PowerPoint® presentation program to deliver the instruction by following a script on each slide. Each lesson followed the same instructional format using explicit instruction (i.e., model-test procedure with immediate feedback), visual representations of vocabulary, a graphic organizer, and audio supports. The primary dependent variable was the number of correct responses measured on a 10-item vocabulary test assessing the academic vocabulary words taught after each instructional session. Additionally, this study also examined (a) the participants' ability to generalize learned vocabulary in isolation to grade-level connected text, (b) differences between the numbers of correct responses on culturally relevant passages compared to correct responses on non-culturally

relevant passages, and (c) stakeholder perceptions of the intervention. Results of this study showed that there was a functional relation for both academic vocabulary knowledge and passage generalization. Cumulative data showed that all participants made slightly more correct responses on the culturally relevant passages than on the non-culturally relevant passages. All six participants demonstrated an ability to increase academic vocabulary knowledge, generalize knowledge using grade-level passages, and, to a lesser extent, maintain learned vocabulary at the end of an 8-week maintenance phase. Results of the social validity consumer satisfaction questionnaires showed positive reporting from the participants, teachers, and family members.

DEDICATION

I dedicate this dissertation to children. I begin the dedication to my daughters and conclude to a student. Tyler, you're my sunshine. Your fun-loving, optimistic view on life is contagious. You teach me daily that lots of little good things are the true path to happiness. I've loved watching you grow and learn. You were the first to show me what joy it is to teach with mutually beneficial outcomes. Lillian, you're my hug. Your compassion and strength for seeing the good in people is admirable. You teach me to savor the moments spent with those we love. You're the stem to my flower, the ice to my cream, and the words in my poem. You taught me a wrist is just an arm ankle, and that is just so true. Finally, I dedicate this dissertation to Samuel Muñoz, my student. I think about you often; we met in your kindergarten transition meeting, and shared our goodbyes your 4th grade year. Your persistent dedication to learning was astounding; your birthday parties were comparable. You taught me differences are temporary. I truly believe you could have fulfilled your dream to become the President of the United States of America. You made me proud. I miss you terribly.

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CHAPTER 1: INTRODUCTION

It has been well established that reading as a skill plays an integral role on the academic outcomes of our lives (Cunningham & Stanovich, 1997; Snow, Burns, & Griffin, 1998). Unfortunately, educating English learners (ELs) with disabilities to comprehend academic vocabulary in U.S. schools is a relatively uncharted practice (Klingner, Boardman, Eppolito, & Schonewise, 2012). Recent large-scale adoption of the Common Core State Standards for English Language Arts (CCSS-ELA, 2010) has prompted a renewed focus on teaching academic vocabulary standards across the curriculum and grade-levels. The CCSS emphasize language demands that prepare students to become globally competent and educated. Therefore, teachers are to plan and develop instruction that offers opportunities for students to "develop skills in reading, writing, speaking, and listening that are the foundation for any creative and purposeful expression in language" (Standards, p. 3). Looking forward past the years of schooling, the ability to understand and proficiently interact with language plays a major role in the outcomes of our personal, educational, and professional lives (Cummins, 2014). As students grow older and progress through the grades, language becomes more complex, social identities are formed (Gee, 2002) and academic content becomes progressively more difficult and sophisticated (Snow & Uccelli, 2009). Among those at greatest risk for poor English language development and reading failure are Latino ELs, particularly those who have also been identified as having a learning disability ([LD] Ford, 2012; Kim &

National Center for Research Evaluations [CRE], 2011; Sullivan, 2011). Notably, overcoming these challenges is no easy feat. Today, students in upper elementary U.S. classrooms and beyond are expected to read a variety of content-area texts, rich with sophisticated vocabulary and then derive meaning for application and generalization of knowledge (Ciullo, Falcomata, & Vaughn, 2014). Unfortunately, Latino ELs identified as LD in reading are among those at greatest risk for reading failure (Klingner, et al., 2012). Although there has been long debate over labeling Latino ELs in special education (Artiles, Rueda, Salazar & Higareda, 2005; Dunn, 1968; Bal & Sullivan, 2014), disproportionality among this population in high incidence disability categories (e.g., LD and language disorders) still exist and reading outcomes, which are highly correlated with academic success, remain dismal (Kena et al., 2014; Snow, Burns, & Griffin, 1998). Moreover, failure risks continue to heighten in the middle and high school years; sadly, this is when failure becomes commonplace and reading deficits have affected all other content areas that require proficiency with reading and understanding informational text to succeed (Ciullo et al., 2014; Bulgren, Deschler, & Lenz, 2007).

Latino English learners in special education. Today, Mexican students are the fastest growing and largest student body of Latino ELs in U.S. schools, and are expected to account for 25% of students in 2020 (Kena et al., 2014). The term, Latino is often used loosely and interchangeably with the term Hispanic (as used by the U.S. Census Bureau); however, Latino is a more exclusive term with diverse populations who trace their roots to Latin America or to Spain (Pew Hispanic Center, 2014). Latino ELs are those who primarily speak Spanish and are in the process of learning English as a second language (Artiles, Rueda, Salazar & Higareda, 2005). Despite the growing numbers of Latino ELs

who bring diverse language and experiences to schools, only 26% of all teachers report feeling prepared to teach students not proficient in English (National Center for Educational Statistics [NCES], 2013). Unfortunately, Latino ELs who qualify for special education services pay the highest price from the increasingly high numbers of under-trained special educators.

There are concerns with identifying Latino ELs with disabilities in schools. The risk ratio for Latino ELs qualifying for special education is disconcerting. For example, of the 14% Latino/Hispanic students identified as English learners with disabilities, 44% are identified as LD and 23% are identified as language impaired (NCES, 2013). Furthermore, once these students are identified as disabled in one of these categories, the intensive and specialized instruction warranted to them become far more inadequate than prior to identification (Artiles et al., 2005; Klingner et al., 2012). Hoover, Klingner, Baca, and Patton (2008) found that Latino ELs who qualify as having one of these disabilities are: (a) more likely to be removed from typically developing peers for the majority of the school day; (b) less likely to receive instruction from a fully credentialed special educator; (c) less likely to receive English language supports; and (d) exposed to less rigorous and sporadic instructional methods that infrequently address culture, language, and disability needs. Addressing the needs of Latino ELs accurately is essential to improve academic outcomes of this population in U.S. schools.

Reading and vocabulary learning of Latino ELs. Similar to all students educated in U.S. schools, Latino ELs are required to read sophisticated texts at higher levels and with deep comprehension that becomes increasingly difficult as grade levels advance (Roberts, Torgesen, Boardman, & Scammacca, 2008). According to Klingner et al.

(2012), one critically impactful difference that compounds challenges for many Latino ELs is the overwhelming task of learning to recognize sophisticated words in print (or decoding), construct meaning from text (or reading comprehension) while simultaneously acquiring the language in which that content is taught (or language comprehension).

Recent research has suggested that intensive intervention of English vocabulary holds promise for ELs' academic success (Goodwin & Ahn, 2010; Lesaux, Kieffer, Faller, & Kelley, 2010; Ciullo et al., 2014). Vocabulary acquisition is vital for all children, particularly for school-aged students, because of the strong relationship between vocabulary and achievement in reading comprehension (Beck, McKeown, & Kucan, 2013). The ability to fully comprehend the meaning of text while reading ultimately is what distinguishes those students with proficient comprehension skills and those with weak comprehension skills. Roberts, Torgesen, Boardman, and Scammacca (2008) pointed out that for older students in particular, accurate and fluent word identification has received considerable attention from researchers, but fluent reading is irrelevant if students are unable to gain meaning from the text. In fact, the ability to fully comprehend text depends on the ability to correctly use techniques that help readers to acquire vocabulary knowledge (Wolter & Green, 2013). Directly teaching students to improve word learning that has lasting effects of vocabulary knowledge is essential in promoting word and text comprehension for all students.

One recommended word learning strategy is to explicitly teach morphemic analysis to students. According to Joanne Carlisle (2000), about 90% of the approximately 3,000 words students learn each year are learned incidentally through word learning, which is known as exposure to words heard or read in their classrooms

and home environments. Although incidental word learning is seemingly effective for students to acquire new vocabulary knowledge, explicit instruction using morphological analysis and context analysis, which is referred to as the two-word analysis when taught together (Graves, 2006), has shown to produce statistically significant more gains than incidental word learning for low performing readers including those with learning disabilities (LD; Bowers, Kirby, & Deacon, 2010; Goodwin & Ahn, 2010). The two-word analysis can equip students with strategies to figure out the possible meanings of the unfamiliar words that impede comprehension during reading (Anglin, Miller, & Wakefield, 1993). As Nagy and Scott (2000) stated, context and morphology (i.e., word parts) are the two major sources of information immediately available to a reader who comes across a new word. Specifically, morphological analysis refers to the analysis of the morphemes or units of meaning within words. Goodwin and Ahn (2010) describe types of morphological treatments to include focus- and practice-based instruction on root/base words (e.g., tooth, teach, relate) and affixes (e.g., -ing, -ed, -less). Students are taught both inflectional morphology, which involves changing the tense of a base word (e.g., run/running, paste/pasted), and derivational morphology, which involves changing a base word from a verb to a noun (e.g., teach/teacher). Understanding vocabulary using morphological analysis requires the mental culmination of identifying morphological patterns, awareness of inflectional and derivational morphology and the ability to build words from morphemes (Goodwin et al., 2010). Constructing understanding of vocabulary while reading is, therefore, dependent on a student's ability to properly connect what was read or heard to personal experience and background knowledge

(Marzano, 1988; Vacca, 2008). This is particularly important for culturally and linguistically diverse English learners.

Academic language acquisition involves the ability to process language at high levels and apply skills such as synthesizing, evaluating, reasoning, and inferring (Snow, 2010).The defining features of academic language include conciseness and correctness. These are achieved by avoiding redundancy, using accurate but simple language, and relying on grammatical processes to compress complex ideas into few words (Snow, 2010). Two specific language skills hypothesized to be essential to reading comprehension outcomes during the period of upper elementary and middle school grades are vocabulary knowledge (i.e., knowledge of word meanings) and morphological awareness (i.e., the understanding of complex words as combinations of meaningful smaller units including prefixes, suffixes, and roots; Lesaux, 2010). A substantial body of research conducted with native English speakers has established the importance of vocabulary knowledge for reading outcomes (for reviews, see Freebody & Anderson, 1983; Nagy & Scott, 2000), and a growing body of evidence suggests that morphological awareness serves as an equally important role (for reviews, see Goodwin & Ahn, 2010; Nagy, Berninger, & Abbott, 2006).

To achieve improved English academic vocabulary outcomes of Latino ELs, more research is needed particularly in regard to learning academic language. The National Literacy Panel on Language Minority Children and Youth (2006) conducted a rigorous research review and found only three studies meeting panel criteria (i.e., included experimental or quasi-experimental studies that focused on second-language acquisition specific to English and resulted as advantageous for these students) on vocabulary

instruction for ELs. In an updated review, August and Shanahan (2010) only found five additional studies that had been published on vocabulary approaches for ELs. Less commonly investigated is research on evidence-based interventions necessary to effectively teach Latino ELs who are in need of specially designed intensive vocabulary instruction. As noted previously, Latino ELs with LD makes this particular population even more vulnerable to school failure compared to other at-risk populations (Kim & Linan-Vaughn, 2013; Klingner et al., 2012; Vaughn et al., 2009). Research is past-due and, therefore, is warranted in order to improve the academic outcomes of Latino students with LD.

Linguistic and cultural contexts. The evidence shows reading outcomes of Latino ELs today are grim (Kena et al., 2014; Klingner et al., 2012). Notably, Latino ELs are a diverse population with varying levels of language proficiency and culturally based vocabularies that may differ from the dominant culture of monolingual English speaking students and educators (Moll Armanti, Neff, & Gonzalez, 1992). These differences are not deficits. Moll et al. (1992) recommend using these unique and valuable characteristics of the learner as resources for teaching, otherwise referred to as Funds of Knowledge. In two studies, Greenwood and colleagues (2002) and Marzano (2004) both found that when Latino ELs were learning new words that were connected to the students' lived experiences, educators could better activate vocabulary learning for these students. Unfortunately, this is a relatively uncommon practice in classrooms and has been associated with one of the causal reasons for dismal academic outcomes of Latino ELs (Artiles, Trent, & Palmer, 2004; Artiles, Rueda, Salazar, & Higareda, 2005; Blanchett, Klingner, & Harry, 2009; Klingner et al., 2005; Klingner et al., 2012). Specifically,

scholars use the term, cultural mismatch to describe expectations within the school (and everything that goes with it) differ from expectations a student has historically grown to learn through lived experiences (Klingner et al., 2012). Cultural mismatches between Latino ELs and schools have led to a number of unnecessary poor, and sometimes detrimental outcomes (e.g., suspensions, expulsions, disproportionality, school dropout; Klingner et al., 2012; Sugai, Fallon, O'Keefe, 2012).

Regardless of special education status, in order to develop the skills necessary to gain meaning of grade level, sophisticated text of Latino ELs, it is important to deliver effective interventions that include, explicit instruction and word learning strategies that build new knowledge by using students' prior knowledge and lived experiences as a springboard to connect culturally and contextually familiar knowledge with new knowledge (August & Shanahan, 2006; 2010; Carlo et al., 2004; Cheung & Slavin, 2013).

Computer-assisted instruction to improve literacy skills. One potential instructional strategy that has shown to be effective for older Latino ELs and those with LD is computer-assisted instruction (CAI). CAI is a versatile term that is typically used when describing specific applications such as drill-and-practice, tutorials, or simulation activities offered either as a stand-alone activity or as supplemental activities to enhance teacher-directed instruction (Cotton, 1991). CAI programs can provide opportunities of additional practice focusing on specific content to strengthen learners' skill development (Slavin & Lake, 2008). CAI offers features (e.g., embedded audio, pictures, short-videos used for demonstrations, built in graphic organizers) that can be embedded within

instruction. Using CAI programs to improve academic performance has become increasingly popular as an alternative to the traditional teacher to student instruction.

In the past 3 decades, over 20 major reviews have been conducted to investigate the effects of CAI programs (e.g., Bangert Drowns, Kulik, & Kulik, 1985, 1991, 2003; Becker, 1992; Christmann & Badgett, 2003; Fletcher, Finn, & Gravatt, 1995; Hartley, 1977; Li & Ma, 2010; Ouyang, 1993; Rakes, Valentine, McGatha & Ronau, 2010; Slavin & Lake, 2008; Slavin, Lake, & Groff, 2009). The majority of these studies examined a wide range of academic subjects (e.g., reading, mathematics, social studies, and science) across primary and secondary grades. Overall, these studies have demonstrated a positive association between CAI use and student achievement. Specifically, Cotton (1991) compiled 59 CAI research studies that provide insight into the benefits and effects of CAI. A few of the research findings shared by Cotton include the following: (a) the use of CAI as a supplement to conventional instruction produced higher achievement than the use of conventional instruction alone; (b) students learned material faster with CAI than with conventional instruction alone; (c) CAI was beneficial for students in primary grades; (d) CAI was more beneficial for lower-achieving students than higher-achieving students; (e) students with disabilities achieved at higher levels with CAI than with conventional instruction alone; and (f) students' fondness for CAI activities centered around the immediate, objective, and positive feedback provided by these activities. There is a growing trend to supplement teacher-directed instruction with CAI; this practice has shown promise for improving academic outcomes of students at risk, particularly when used in combination with additional effective practices and presents a feasible intervention for ELs learning academic language.

Peer-mediated instruction to improve literacy skills. One evidence-based practice that has recently shown promise when used in conjunction with CAI is peer-mediated instruction (Cheung, 2013; Cheung & Slavin, 2012; Gersten et al., 2007; Greenwood, Arreaga- Mayer, Utley, Gavin, & Terry, 2001). Peer-mediated instruction refers to a teaching arrangement in which peers learn while teaching; peers are taught to present information systematically, elicit and monitor peer responses while providing immediate feedback (Maheady, Harper, & Sacca, 1998). Key structural elements are necessary for correct implementation of peer-mediated instruction. According to Maheady, Harper, and Mallette (2001), fundamentals of peer-mediated instruction include step-by-step instructions, corrective feedback, reinforcement, and active student learning; however, the procedural packaging of such instruction is highly adaptable. Maheady et al. (2001) illustrate the many variations of peer-mediated instruction (or peer tutoring) across use (e.g., individual, small group, cross-age, and/or classwide), across settings (e.g., general, special, or compensatory education), and how it can be combined with various strategies (e.g., comprehension, self-management, and cognition). The notion of procedural elasticity lends peer-mediated instruction to be relevant to educational multiplicity and the growth of student diversity within heterogeneous environments (King-Sears, 2001).

Peer-mediated instruction has shown to be effective for Latino ELs and for those students with LD (Cheng & Slavin, 2013; Gersten et al., 2007; Saenz, Fuchs, & Fuchs, 2005). Cheung and Slavin (2012) provide some evidence from a recent review of literature that the combination of peer-mediated instruction and CAI (i.e., instruction prompted by the computer but delivered by students) is promising; however, further

investigation is warranted to address additional elements within literacy such as vocabulary instruction (Chard, Vaughn, & Tyler, 2002).

Culturally relevant instruction to improve literacy skills. Learning appears to be enhanced when it occurs in contexts that are familiar and meaningful to students, particularly when instruction is carefully planned for and delivered to account for culture and language differences that may interfere with learning (Orosco & Klingner, 2010; Villegas & Lucas, 2002). Previous research has indicated that culturally relevant teaching approaches can have a powerful effect on Latino ELs' reading skills and knowledge development. Specifically, culturally relevant approaches provide cognitive elements (e.g., instructional engagement, contextualization, oral language development, and collaboration) in three aspects that support Latino ELs. First, culturally relevant approaches include direct and explicit instruction that provides modeling and oral language development with evidence-based reading components drawing from students' relevant background knowledge and native language (e.g., August & Shanahan, 2006). Second, culturally relevant instruction provides questioning support that assists students in answering questions about reading passages, feedback to students regarding their answers, and opportunities for students to ask and answer questions about challenges they encounter during reading (Jiménez, García, & Pearson, 1995; Kamps et al., 2007). Finally, culturally relevant instruction provides engaging and motivating collaborative practices, which not only get students involved in all reading activities, but also allow them to practice skills-based instruction in small groups (e.g., Calhoon, Al Otaiba, Greenberg, King, & Avalos, 2006; Klingner & Vaughn, 1996; Sáenz et al., 2005).

Although research is evident that both ELs and students with LD increase achievement outcomes when intensive, peer-mediated, explicit instruction is used with fidelity and incorporates strategic methods (e.g., prime background knowledge; August & Shanahan, 2006; Carnine, Silbert, Kame'enui, & Tarver, 2004; Klingner, Artiles, & Barletta, 2006; Slavin & Cheung, 2005), culturally relevant instruction remains limited. In order to build an evidence base for culturally relevant instruction (in this case, what is culturally relevant to Latino ELs with LD), it is important to separate (operationally, not instructionally) the components of instruction that are prescribed in relation to a discrete cultural variable that shows statistically significant effects on a measured dependent variable. This study will attempt to address specific culturally relevant elements that are purposefully selected to address isolated cultural variables (e.g., language, age, geographic location).

Summary

Research efforts for general education students, those with LD, and ELs in literacy predicate the need for high quality instruction for students who are at double risk factors, such as ELs with LD. Previous research has established that certain shared components in instruction have increased academic outcomes of ELs and students with LD; however, combined risk factors (i.e., ELs with LD) need to be investigated. Components of effective instruction include explicit training, clear and systematic instructions, scaffolding, frequent monitoring during instruction, and multiple opportunities for students to respond with immediate feedback (August & Shanahan, 2010; Carnine et al., 2006; Kennedy et al., 2012; Klingner et al, 2012; Vaughn et al., 2009; Wood et al., 2012). Computer-assisted instruction and peer-mediated instruction

are two instructional procedures that share these components. The research base on Latino ELs with LD is only emerging, and more research needs to be conducted on the efficacy of vocabulary instruction with this student population. One model of vocabulary instruction that holds promise for Latino ELs with LD is peer-delivered, computer-assisted explicit vocabulary instruction with culturally relevant features embedded. Although studies have shown the effects of peer-delivered, computer-assisted instruction, and explicit vocabulary instruction on academic learning of Latino ELs, no study to date has shown measurable effects of such instruction with culturally relevant features on improving academic vocabulary knowledge for ELs with LD.

Significance of Study

The theoretical framework for this study draws on three lines of research: (a) component skills implicated in the reading comprehension difficulties of Latino ELs and students with LD; (b) the development of morphological awareness and vocabulary knowledge in native English speakers, Latino ELs, and students with LD; and (c) the characteristics of effective instruction to promote independent word learning. The results of this study have the potential to provide promising implications that include building additional evidence towards: (a) a model for intensive instruction that uses efficient, low cost research-based strategies with limited teacher support to improve academic vocabulary and comprehension of ELs with LD; (b) supporting the use of culturally relevant practices with Latino ELs with LD; (c) acknowledging that Latino EL students with LD can learn grade-level academic vocabulary with the use of explicit computer-assisted, peer-mediated vocabulary instruction; (d) understanding students' ability to generalize learned skills to both culturally relevant and non-culturally relevant passages;

and (e) providing a specially designed instruction model for use in schools to support Latino ELs with LD and other at-risk students in the area of reading and vocabulary development.

Research Questions

This study centered on teaching Latino ELs with LD to comprehend academic vocabulary using peer-delivered, computer-assisted, explicit instruction and to measure the differences between participants' ability to generalize learned vocabulary on culturally relevant and non-culturally relevant passages. This study addressed the following research questions.

1. What were the effects of culturally relevant peer-delivered, computer-assisted vocabulary instruction on academic vocabulary acquisition of Latino ELs with LD?

2. What were the effects of culturally relevant peer-delivered, computer-assisted vocabulary instruction on academic vocabulary generalization of Latino ELs with LD?

3. To what extent were there differential effects of the intervention on targeted vocabulary generalization of the participants using culturally relevant (CR) and non-CR passages?

4. What were the teachers' perspectives on the importance, acceptance, and effectiveness of the intervention?

5. What were the participants' perspectives on the importance, acceptance, and effectiveness of the intervention and preference of the passages for generalization?

6. What were the perspectives of the parents of the participants on the culturally
    relevant features that address language and ethnicity of the intervention (i.e.,
    adding Spanish cognates and reading Latino specific literature)?

Limitations/Delimitations

This study sought to examine the effects of a culturally relevant peer-delivered computer assisted vocabulary intervention on academic vocabulary acquisition of Latino ELs with LD in upper elementary grades. Additionally, this study sought to investigate to what extent, if any; differential effects were found on targeted vocabulary generalization of the participants using culturally relevant (CR) and non-CR passages related to the intervention. It is important to define the limits of the current study so accurate interpretation of these results are stated clearly and not misinterpreted. First, this study was conducted with upper elementary Latino, native Spanish speaking students identified as having a learning disability in reading. This affects the ability to generalize these results to other: (a) ethnicities, (b) cultures, (c) disabilities or those without disabilities, and (d) grade levels. Another limitation to this study is the intervention is a package, including different components, so interpretation should be made with caution as this study was not designed to determine effects of separate components. Lastly, the culturally relevant component was developed considering specific geographical location, experiences of the participants living in a southeastern region of the United States, so generalization to other Latino ELs living in different geographic locations cannot be made from this particular study.

Definition of Terms

Terms that will be used in the study and their definitions are presented in the following section. The terms chosen will be critical for understanding the implementation procedures and observed results.

Academic English: The English language ability required for academic achievement in classrooms and academic settings. Typically found in textbooks, lectures, and academic assignments (Haager, 2007).

Academic vocabulary: Terms and expressions used across academic subject areas that are considered crucial for student comprehension and learning (Beck et al., 2002).

Acculturation: This term refers to the process of adapting to a new culture. It involves developing and understanding a new pattern of thoughts beliefs, system of communication (Hoover & Collier, 2004; Collier, 1988).

Affix: Part of word that is "fixed to" either the beginnings of words, known as prefixes, or the endings of words, known as suffixes (Anglin, Miller, & Wakefield, 1993).

Authentic assessment: an alternative to a traditional assessment that is typically developed from classroom instruction that is purposefully tailored for relevance to the students or real-world problems (Valencia, Hiebert & Afflerback, 1994).

Bilingual: This term refers to proficient speakers of two languages. For example, a person who speaks English and Spanish is considered to be bilingual (Pew Hispanic Center, 2014).

Cloze passage: A cloze passage is a reading comprehension exercise in which words have been omitted in a systematic fashion. Students fill in the blanks, and their

responses are counted correct if they are exact matches for the missing words (Rye, 1982).

Cognates: Words that are spelled the same or look the same and share the same meaning in two different languages (Proctor & Mo, 2009).

Common Core State Standards: These are a set of national standards ensuring that all students across the United States are held to the same level of expectation and are intended to prepare students for success in postsecondary education. Each grade level has a set of standards that students must be considered proficient across the academic content areas (Common Core State Standards Initiative, 2010).

Computer-assisted instruction: Computer-assisted instruction (CAI) involves learning through the use of computers and/or other multimedia systems (Dalton & Grisham, 2011).

Culturally and linguistically diverse: The term refers to students with culturally and linguistically diverse backgrounds who bring different values, culture, and language than what is the majority in the classroom and school (Hoover et al., 2008).

Cultural context: This term refers to the setting that a child learns and applies language (Turnbull & Justice, 2012).

Cultural discontinuity: This term refers to conflict a student has because of a cultural or value clash with the teacher or the school expectations (Heath 1983).

Culturally and/or contextually relevant instruction: This term refers to the act of ensuring students reap educational benefit because unique variables, characteristics, and learning histories of the students are considered during the process of selecting, developing, and delivering instruction (Sugai et al., 2012).

Culturally responsive instruction: This term refers to teachers making meaningful connections to the diverse backgrounds of their students while emphasizing a rigorous curriculum and high expectations for achievement (McIntyre et al., 2009).

Culture: The complex system of core beliefs and attitudes that shape the thoughts and behaviors of a group of people (Baca & Cervantes, 2004).

Disproportionality: This term refers to an instance where students from particular racial or ethnic groups are identified either at a greater or lesser rate than all other students for special education; therefore, students who do not meet the criteria for special education identification may be identified inappropriately as having a disability, whereas other students who are in need of special education services may not receive such services (Donovan & Cross, 2002; Ford, 2012).

Dominant language: Dominant language is a student's stronger language as determined by assessments. Dominance does not constitute proficiency. Students learning English as a second language frequently become dominant in English due to first language loss while remaining limited in their English skills (Artiles, Rueda, Salazar, & Higareda, 2005).

English learner: English learners (ELs) are students whose first language is not English and who are in the process of learning English (Gersten & Baker, 2000).

Explicit instruction: This term refers to a way of teaching systematic lessons in specific instructional strategies that usually include a statement of the objective, modeling, scaffold practice, and error correction (Carnine et al., 2006).

Expressive language: This term refers to language a person spontaneously produces and consists of form, content, and use (Turnbull & Justice, 2013).

Funds of identity: This term refers to a student's "historically accumulated, culturally developed and socially distributed resources" that a particular student uses to define himself or herself (Esteban-Guitart & Moll, 2014, p. 32).

Funds of knowledge: This term refers to the concept that culturally and linguistically diverse children are competent and have accumulated knowledge from life experiences that are valuable educational resources (Moll Armanti, Neff, & Gonzalez, 1992).

Graphic organizers: Text, diagram or other visual device that summarizes and illustrates interrelationships among concepts in a text. Graphic organizers are often known as maps, webs, graphs, charts, frames, or cluster (Blachowicz & Fisher, 1996).

Generalization: This term is often used in single case research methodology as a secondary measure that allows for intermittent performance evaluation throughout the study. A variable is changed such as the setting, content area, or material without instruction but can be related to the intervention. This is an additional measure that can add confidence to the effects of the intervention. This is an alternative to using a pretest/posttest format in experimental research (Gast & Ledford, 2010).

Latino: The term Latino refers to people who trace their heritage to more than 20 Spanish-speaking nations worldwide; the majority of Latinos living in the United States are Mexican. Mexican Latinos are also the largest population of ELs in United States schools (Aud et al., 2013; Pew Hispanic Center, 2014).

General academic words: Vocabulary common to written texts but not commonly a part of speech; in the Standards, general academic words and phrases are analogous to Tier Two words and phrases (Beck et al., 2002; 2013; Coxhead, 2000).

Limited English proficient: The term, limited English proficient (LEP), refers to students who receive services of language assistance such as English as a Second Language (ESL). It does not refer to students who are learning a language other than English. The term includes students who were not born in the United States and/or students whose primary language is non-English (August & Shanahan, 2006).

Indirect vocabulary learning: Vocabulary learning that occurs when students hear or see words used in many different contexts by exposure to language within the environment (Beck & McKeown, 2007).

Language learning disability: A language learning disability (LLD) is a disorder that may affect the comprehension and use of spoken or written language as well as nonverbal language, such as eye contact and tone of speech, in both adults and children (Turnbull & Justice, 2013).

Language proficiency: To be proficient in a second language means to effectively communicate or understand thoughts or ideas through the language's grammatical system and its vocabulary, using its sounds or written symbols. Language proficiency is composed of oral (listening and speaking) and written (reading and writing) components as well as academic and non-academic language (Hargett, 1998).

Learning disability: A learning disability (LD) is a developmental disability characterized by difficulty with certain academic skills such as reading or writing in individuals with average intelligent quotients (Turnbull & Justice, 2013)

Morphology: The study of how the aspects of language structure are related to the ways words are formed from prefixes, roots, and suffixes (e.g., mis-spell-ing), and how words are related to each other (Graves, 2004).

Peer-mediated interventions: Peer-mediated interventions serve as alternatives to traditional teaching. Students are taught to teach and learn academic and/or social skills from their peers as the teacher monitors. There are cooperative (whole class) and dyad (two students) grouping options (Maheady, Harper, & Mallette, 1991).

Peer tutoring: Teaming pairs of same-age students to practice academic skills. One-way peer tutoring involves one student teaching another student and reciprocal peer tutoring involves students alternating tutor/tutee roles (Eiserman, 1988).

Peer-delivered instruction: Instruction delivered by peers with the support of the classroom teacher. The classroom teacher's role changes from delivering instruction to establishing, monitoring, and improving peer-teaching activities (Utley & Mortweet, 1997).

Reading: refers to deriving meaning from written or printed text; involves both decoding and comprehension (Carnine, Silbert, & Kame'enui, 1997).

Reading comprehension: refers to the ability to gain meaning (National Reading Panel, 2000).

Receptive language: The aspect of spoken language that includes listening, and the aspect of written language that includes reading (Turnbull & Justice, 2013).

Specific learning disability: (i) General. Specific learning disability means a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, that may manifest itself in the imperfect ability to listen, think, speak, read, write, spell, or to do mathematical calculations, including conditions such as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. (ii) Disorders not included. Specific learning

disability does not include learning problems that are primarily the result of visual, hearing, or motor disabilities, of mental retardation, of emotional disturbance, or of environmental, cultural, or economic disadvantage (Individuals with Disabilities Education Act, IDEA, 2004).

Speech or language impairment: means a communication disorder, such as stuttering, impaired articulation, language impairment, or a voice impairment, that adversely affects a child's educational performance (Individuals with Disabilities Education Act, IDEA, 2004).

Vocabulary: Vocabulary refers to the words a reader knows. Listening vocabulary refers to the words a person knows when hearing them in oral speech. Speaking vocabulary refers to the words we use when we speak. Reading vocabulary refers to the words a person knows when seeing them in print. Writing vocabulary refers to the words we use in writing.

Vocabulary knowledge: Knowing what words mean in the context in which they are used (Snow, 2010).

CHAPTER 2: REVIEW OF THE LITERATURE

The purpose of this study was to examine the effects of a peer-mediated, computer-assisted explicit vocabulary instruction on vocabulary acquisition and generalization on culturally responsive and non-culturally responsive passages with Latino ELs with LD. The theoretical and empirical research on the following topics is applicable to the purpose of this study, including (a) disproportionate representation of Latino English learners (ELs) in special education and the differences and similarities between the acquisition of a second language and characteristics of a language-based disability, (b) a review of culturally responsive literacy and academic vocabulary interventions for ELs and students with language-based disabilities, (c) a review of peer-mediated instruction in reading, and (d) a review of literature addressing computer-assisted instruction. Each topic will be summarized and the direct relation to the purpose of the current study will be highlighted.

English Learners in U.S. Schools

Within the United States, there has been a dramatic increase in the number of school age children from homes where English is not the primary language. Between 1980 and 2011, this population of children rose from 4.7 to 11.2 million (Aud et al., 2013); of this population, the majority were born in the United States and 73% came from homes in which Spanish is the primary language spoken (Batalova & McHugh, 2010).

Although many ELs in the United States thrive academically when compared to their majority-culture peers, Latino ELs on average demonstrate lower academic achievement, experience a higher rate of grade retention, and drop out of school at a higher rate (August & Shanahan, 2006; 2010; Fry, 2007; Snow, Burns, & Griffin, 1998). These are many risk factors that are associated with lower academic outcomes of Latino ELs, including poverty, low parental education and literacy rates, and enrollment in less resourced, low performing schools with high numbers of other students who are at risk for poor academic and post-school outcomes (Aud et al., 2013; Capps et al., 2005; Fry & Gonzalez, 2008). One specific challenge that is twofold for Latino ELs is that these students are simultaneously learning academic content while developing English language proficiency. This overstimulating task involves the process of attempting to keep up with their monolingual English classmates (e.g., receptively and socially), while at the same time are required to read in a language they are not fully proficient. Understanding factors that prevent Latino ELs from successful learning is critical to improve academic outcomes of Latino ELs served in U.S. schools.

Disproportionality

Disproportionality is defined as an overrepresentation or underrepresentation of a particular group of students in special education (Gravois & Rosenfield, 2005). Historically, literature has shown that disproportionality in special education continues to persist and factors other than poverty and race are becoming more widespread (Artiles, Rueda, Salazar, & Higareda, 2005; Coutinho & Oswald, 2000; Ford, 2012; Sullivan, 2011). One of the first articles addressing disproportionality was published more than 40 years ago, Dunn (1968) investigated the disproportionate representation of ethnically and

racially diverse students being labeled as mentally retarded, now referred to as intellectual disability. Dunn's study brought attention to students' civil rights in education and gave rise to numerous subsequent studies regarding the overrepresentation of ethnically and racially diverse students from poor communities in special education programs.

In a subsequent study, Mercer (1973) investigated the overrepresentation of African American and Mexican American students in special education classes and found that public schools identified and labeled more students (i.e., African and Mexican Americans) as mentally retarded than any other institution serving children. Similarly, Hosp and Reschly (2004) conducted a comparison analysis and found that a student's racial/ethnic category is highly correlated and a strong predictor for being referred to and placed in a special education program; the authors specifically identified Hispanic, African American, and American Indian as a statistically significant predictor of being identified as having a behavioral disability and learning disability. In another study, Gottlieb et al. (1994) collected longitudinal data on the referral and placement of low-performing students in special education programs in urban school districts over a 10-year period. Their analysis revealed that 95% of students within the special education population were of a racial or ethnic minority group.

There is a growing body of literature focusing on the overrepresentation of Latino students in special education programs. For example, Ortiz and Yates (1983) as cited in Ortiz (1997) found that Latino students in Texas were overrepresented in special education programs by more than 300%. In another study, Blanchett et al. (2009) examined the intersection of language and learning disabilities and found that Hispanic

students were 1.5 times more likely to be identified as having a learning disability when compared to their White peers. As evident from ongoing and consistent findings from existing research, scholars in the field (e.g., Dunn, 1968; Mercer, 1973) have long questioned the social constructs of high incidence disabilities and the practice of sorting children on the basis of the intersections of race, culture, socioeconomic status, and perceived ability.

English learners. In more recent years, researchers have begun to put language at the forefront of the investigation. There has been a growing body of literature investigating the representation of ELs in special education programs. However, disproportionate representation among Latino ELs in special education has not been as apparent compared to other disproportionate groups (e.g., African Americans) who are consistently overrepresented in specific disability categories (Ford, 2012; Sullivan, 2011). For example, McCardle (2005) reported that educators often hesitate to identify young ELs as being at risk for reading difficulties, even when there is evidence of risk on widely used measures of early literacy. McCardle concluded that although these findings are inconsistent with best practices, many ELs are often only flagged for support services, including special education services, after ongoing and persistent underperformance has continued for years. In two other studies, Limbos and Geva (2001) and Samson and Lesaux (2009) found that young ELs who demonstrated weaknesses in English on phonological processing tasks in English speaking countries (i.e., United States and Canada) were less likely than their native English-speaking peers to be identified as being at risk and to receive supplemental services to support reading development. In turn, based on nationally representative data, ELs are underrepresented and underserved in

special education in early grades such as kindergarten and first-grade (Artiles, Rueda, Salazar, & Higareda, 2002; Samson & Lesaux, 2009).

As is true for many learners who are overlooked for early intervention services, ELs are at a major disadvantage for attaining reading proficiency by third grade (National Reading Panel, 2000; Samson & Lesaux, 2009; Snow et al., 1998). For example, Artiles et al. (2005) examined the placement pattern of Latino ELs in urban school districts in California and found that an increasing number of Latino ELs were being placed in special education programs at the upper elementary level, and Latino ELs were considerably overrepresented at the secondary level. Additionally, Latino ELs were between 1.42 and 2.43 times more likely to be identified and served in a program for students identified as having a mild intellectual disability (ID), learning disability (LD), or speech/language impairment (SI) when compared to their English-speaking peers. The results of this study also showed that language proficiency was highly correlated to the likelihood of being identified as having LD or SI. Furthermore, data revealed that Latino ELs at the secondary level who were considered limited proficiency in both their native language and in English were more likely to be placed in disability categories (i.e., ID, LD, and SI) compared to their Spanish-proficient and English-proficient peers.

In summary, disproportionate representation of specific racial, cultural, and linguistically diverse populations in U.S. schools is not a new phenomenon. In fact, disproportionality in special education has long been a debated topic even prior to Education for All Handicapped Children Act of 1975 (e.g., Dunn, 1968; Mercer, 1973). Historically, Latino English learners, who are the fastest growing student body in schools, are on an average, underrepresented nationally, yet are frequently underrepresented in

early elementary and overrepresented during adolescence in the high-incidence disability categories([LD, SI, and ID-mild]; Artiles, Rueda, Salazar, & Higareda, 2005; Blanchett et al., 2009).

ELs with Language-Based Disabilities

To better understand the term of language- based disability, discussion on language acquisition and English as a second language is provided, followed by the definition of language-based disability.

Language. Language is defined as a rule governed cultural and behavioral code that a person uses to represent thoughts and ideas; once thoughts and ideas are formulated, they can be communicated to other people through speech or sign (Turnbull & Justice, 2013). Language includes three major components: form, content, and use; each of the components includes basic rule systems. When a person talks, the following occurs: the individual has an idea and encodes it (semantics) into symbol (e.g., sound/word). To produce a word, the individual selects appropriate sound units (phonology), appropriate word beginnings and endings to further define meaning (morphology), and appropriate word order (syntax). Finally, the purpose of talking is to accomplish a functional goal in life. Pragmatics provides the rules for using language (Beukelman & Mirenda, 2005). This is important because students identified as having language-based disabilities and those learning English as a second language share many similar characteristics that affect one or more components of language and learning.

English as a second language. Latino ELs often learn English as a second language (ESL) where they speak a first language other than English and learn English in the context of an English-speaking country (Schmitt, Justice, & Pentimonti, 2013).

During the process of a second language acquisition, speakers create a language system called an interlanguage; this is the time period which language includes elements of the first language and the second language as well as elements found in neither of the two languages (Schmitt et al., 2013). Language learning continues throughout life and generally goes through two ways of language acquisition no matter the age of the individual learning the language. First, people develop form or "rule knowledge" about the language; and second, a process of refining skills involves increased speed of verbal communication and processing (Schmitt et al., 2013). This is of particular importance for Latino ELs learning these language processes. Cummins (1991) sorted these terms as communication and academic learning in the classroom. Specifically, Cummins discussed the need for ELs to develop conversational confidence that he called basic interpersonal communication skills (BICS) and confidence in communicating within the classroom called cognitive academic language proficiency (CALP). Later, Collier and Thomas (1999) found that it takes most ELs 5 to 7 years to develop native-like academic language proficiency and literacy; however, it can take 7-10 years for students with an interrupted formal education or those who were already below grade level to develop grade level proficiency and literacy skills in English. Hakuta, Butler, and Witt (2000) concurred that ELs need a minimum of 3 to 5 years to develop proficient communication skills in English whereas academic English proficiency was noted to take a longer span than earlier findings of 4 to 7 years. After the discoveries noted above, Cummins and Mann (2007) found that there was limited transfer between the development of the first two language skills (e.g., conversational competence and language) and of academic

language proficiency for many ELs. The authors concluded with the implication to develop all three types of language skills to produce native-like English proficiency.

A later study specific to academic learning was conducted by Goldenberg and Coleman (2010). These authors found that deep comprehension of academic content required students to acquire a more thorough understanding of the subjects that went beyond the vocabulary unique to the content taught. An important implication from this study for ELs is that the use of explicit instruction in academic language can help support ELs' development of both receptive language skills (i.e., multiple exposures of the language taught) and expressive language skills by providing opportunities for students to write or discuss using academic language.

Language-based disability. In educational settings, language is foundational for students' ability to understand instruction, participate in classroom discussions, establish working relationships with peers and teachers, synthesize information, and expand knowledge. As proposed in the forthcoming diagnostic statistical manual of mental disorders fifth edition (DSM-5), the definition of a learning disorder, otherwise known by U.S. school systems as a specific learning disability (SLD), is a condition that interferes with the acquisition and use of one or more of the core academic skills (Clay, 2011). A reported 2.4 million children in public schools are diagnosed with SLD (U.S. Department of Education, 2010), including language-based disabilities, in which children exhibit problems with spoken and written language that impact success across academic content areas (National Joint Committee on Learning Disabilities [NJCLD], 1990). These students on average have typical cognitive abilities but share a common underlying deficit in language ability that persists from preschool through adulthood (NJCLD, 1990).

The underlying deficit for children with a language-based disability is their weak language system and not cognitive impairments (NJCLD, 1990); these children have a history of subtle language problems (e.g., slightly delayed pauses before responding, word retrieval difficulties) that may not be significant enough to warrant identification of a language impairment (Ehren & Lenz, 1989). Children with weak oral language skills early in life are at a significant higher risk for these weaknesses to impact academic progress, specifically in the ability to use language to access instruction, to express themselves on academic topics, and to comprehend texts (Webster & Plante, 1992). Similar to the acquisition of language, students with a language-based disability may be able to hold a casual conversation without concern, read a book for pleasure, or write an e-mail to a friend; however, they often struggle with debating issues in academic classes, reading the academic textbook to gain information, or writing a persuasive essay. Snow (2010) explained that this discrepancy between skill sets has much to do with children's ability to manage the shift from oral to literate language. Snow further suggests that language learning occurs along a continuum, with oral language used for informal, everyday discourse on one end, and more formal, highly literate forms of language on the other. The more formal forms of language are typically gained after proficiency of informal language has been acquired. As described earlier, a similar acquisition process is true for Latino ELs.

Although there is great need for ELs identified with a language-based disability to receive quality instruction, researchers have found that these students are often taught by special educators who (a) are not trained to provide tailored instruction to meet Latino ELs language needs (Klingner, Artiles, & Mendez Barletta, 2006); (b) lack understanding

of culturally responsive practices (Zehler et al., 2003); and (c) do not collaborate with ESL specialists who may have expertise (Klingner & Soltero-Gonzales, 2009). As a result, specially designed and intensive instruction (i.e., special education services) for ELs with LD more frequently fall further behind their general education peers and lose access to the specialized language instruction (e.g., ESL services) that is required (Zehler et al., 2003).

Summary

Disproportionality of Latino ELs in special education is evident. Specifically, ELs have been found to be underrepresented overall on most special education rosters (McCardle et al., 2005); however, they tend to be overrepresented in language-based categories, including identification of having a reading disability and speech language impairment (Artiles & Ortiz, 2002; Artiles et al., 2005), and most likely to be overidentified in these specific disability categories in grades three and above (Artiles & Ortiz, 2002; Donovan & Cross, 2002; Samson & Lesaux, 2009). Furthermore, many of these students disproportionately receive special education services in urban, low-performing schools with other at-risk populations for poor academic and post-school outcomes (Donovan & Cross, 2002).

Unfortunately, the connection between language and disability is not fully understood. For many educators, distinguishing between limited English proficiency and a language-based disability has been a challenge (see Artiles et al., 2002; Barrera, 2006; Blanchett et al., 2009; Samson & Lesaux, 2009; Robertson & Kushner, 2008). Given the knowledge that language is required for learning, and that a child's acquisition of language skills establishes a stable trajectory for academic progress throughout schooling

(Justice, Bowles, Pence, Turnbull, & Skibbe, 2009), Latino ELs identified as having a

language-based disability face elevated risks for poor academic achievement (Artiles et

al., 2002; Barrera, 2006; Blanchett et al., 2009; Samson & Lesaux, 2009; Robertson &

Kushner, 2008). As language demands continue to build (e.g., CCSS-ELA, 2010), and as

academic contexts require more language proficiency at the literate end of the language

continuum, these students quickly find themselves in a perpetual state of academic

struggle. Intervention and remediation efforts offer support for ELs and those with

language-based disabilities; however, empirical research suggests that students identified

as ELs with a language-based disability rarely achieve the language competency of their

typical peers (Klingner et al., 2012; Turnbull & Justice, 2013). A potential solution to

improve academic outcomes of Latino ELs identified as having a language-based

disability is to provide a culturally responsive peer-mediated explicit vocabulary

instruction. The characteristics of this intervention holds potential to ameliorate

vocabulary comprehension challenges of Latino ELs that are highly correlated as a

primary predictor for overall academic success (see Kame'enui & Baumann, 2013; NRP,

2000; Snow, 2010).

Vocabulary Instruction and Culturally Responsive Interventions

Vocabulary learning includes both receptive learning (i.e., comprehending words

heard and read), and expressive learning (i.e., producing words in speech and writing;

Baumann, Edwards, Boland, & Font, 2013). Students identified as having a language-

based disability and ELs share similar challenges in acquiring language skills required to

become proficient users of formal language (i.e., academic vocabulary). For both

populations, some language skills are developed more quickly than others (August, Carlo,

Dressler, & Snow, 2005). For example, some students might have a relatively strong understanding of grammar but struggle with pragmatics. Others might have a solid understanding of pragmatics, yet have a relatively limited vocabulary (August et al., 2005). These students present a range of conversational abilities. For instance, some ELs appear to be native-like during an informal conversation; the same is true for some students with LD who appear to be without a disability in most social situations (Justice & Turnbull, 2013). However, both populations, whether apparent or not, perform lower in ability to comprehend technical academic language compared to their conversational skills (Short & Fitzsimmons, 2007; Valdés, Bunch, Snow, Lee, & Matos, 2005).

A number of studies indicate that many Latino ELs in the upper elementary and middle school grades continue to lag far behind their native English speaking peers in English vocabulary and that this lag has critical consequences for reading comprehension (Cameron, 2002; Garcia, 1991; Geva, 2006; Mancilla-Martinez & Lesaux, 2010; Proctor et al., 2005, 2006; Roessingh & Elgie, 2009; Snow & Kim, 2007). By grades four and five, Latino ELs on average score more than two grade levels behind their native English speaking peers in English vocabulary knowledge. A few studies illustrate these differences. First, Proctor et al. (2005) found that a group of 132 fourth-grade Latino ELs scored at the late first-grade level in English vocabulary knowledge. Similarly, Mancilla-Martinez and Lesaux (2010) reported that 173 low-achieving, 11-year-old, Spanish-speaking ELs scored at the 21st percentile in a standardized test of expressive English vocabulary, with their average raw score equivalent to that of an 8.5- to 9- year-old native English speaking peer. In addition, these Spanish-speaking students' percentile scores slowly increased from age 4.5 to age 8 and then decreased slightly from age 8 to 11,

suggesting that a vocabulary gap at the mid-elementary level may continue to widen as Latino ELs progress through the grade levels. This example provides one example of why early intervention for Latino ELs is important, but equally important is forming an evidence base of intensive vocabulary interventions that can ameliorate learning deficits that seem to exacerbate and affect other areas of academic performance (Artiles & Ortiz, 2002; August & Shanahan, 2010; August, et al., 2005; Beck & McKeown, 2007).

Morphemic analysis. One method that lends opportunity to include the essential vocabulary instruction components derived by Graves (2006) and Baumann et al. (2013) is morphemic analysis. Morphemic analysis involves deriving the meaning of a word by examining its meaningful parts called morphemes (Baumann et al., 2013). Morphemes are the smallest units of meaning within words (i.e., roots, prefixes, and suffixes). Baumann and colleagues conceptualized instruction of morphemic analysis as teaching students to disassemble words into roots and affixes (e.g., pregame = pre- + game), and acquiring the meaning of those roots and affixes (e.g., pre- = before; [therefore], pregame = before the game). Explicit instruction using morphological analysis and context analysis, referred to as the two-word analysis, has shown statistically significant gains for low-performing readers in several of recent studies (Bowers et al., 2010; Coyne et al., 2013; Goodwin & Ahn, 2010; Goodwin et al., 2012).

Until recent, morphemic analysis has not received much attention or been used as strategy in classrooms (see Bowers & Kirby, 2010; Carlisle, 1995; Nune & Bryant, 2006). However, morphemic analysis is not a novel concept; its absence from use in classrooms has been suggested as ruthful (e.g., Carlisle 1995; Nune & Bryant, 2006) because of the powerful capabilities morphemic analysis has on the depth and breadth of vocabulary

acquisition. For example, Nagy and Anderson (1984) conducted an analysis of vocabulary in materials students encounter in school, the authors asserted that "for every word a child learns, we estimate that there are an average of one to three additional related words that should also be understandable to the child" (p. 304). The authors qualified this estimate by stating that this kind of vocabulary growth depends upon "how well the child is able to utilize context and morphology to induce meanings" (p. 304). In other words, students trained in contextual and morphemic analysis have the potential to increase their vocabulary knowledge substantially. Morphemic analysis has become popular in the 21st century, and in fact, are now included in national curriculum standards (i.e., Strand 4) for English Language Arts in grades kindergarten through grade 12 (CCSS-ELA, 2010).

Since the inception of the Common Core State Standards-English Language Arts, two literature reviews were synthesized on the effects of morphological interventions for at-risk learners in the area of literacy (i.e., Bowers et al., 2010; Goodwin & Ahn, 2010). The first review by Bowers et al., (2010) reviewed of 22 studies conducted from preschool to grade 8. The authors investigated the effects of morphological instruction on (a) reading, spelling, vocabulary, and morphological skills (e.g., understanding pre- means before), (b) at-risk readers, (c) older versus younger students, and (d) in combination with other literacy skills versus in isolation. Results from this review indicated that morphological instruction benefited all learners, particularly struggling readers, that there was no differences between older and younger students, and that morphological instruction was more effective when combined with other aspects of literacy such as texts read or read aloud.

Similarly, Goodwin and Ahn (2010) synthesized 17 studies and found morphological awareness instruction to be particularly effective for students with reading, learning, or speech language disabilities, ELs, and at-risk readers. The most significant differences were on phonological awareness, morphological awareness, vocabulary, and reading comprehension. The authors attribute these significant findings to the explicit morphological awareness instruction participating students received in these studies. These finding suggest that school-age children who received explicit morphological awareness instruction appeared to improve significantly not only in the linguistic areas of phonological awareness, morphological awareness, and vocabulary knowledge, but also in the related literacy areas of reading and spelling (Bowers et al., 2010; Carlisle, 2010; Goodwin & Ahn, 2010; Goodwin et al., 2012; Reed, 2008).

Both reviews (Bowers et al., 2010; Goodwin & Ahn, 2010) suggested similar implications. First, morphological interventions that occur in the context of rich instruction in specific word meanings are most effective. Second, to promote students' ultimate use of morphological awareness as a tool for comprehending and composing academic text, morphological manipulation is best taught explicitly. Finally, effective morphological interventions that involve providing students with meaningful contexts in which they can practice these strategies produce better results. These findings are promising for at-risk readers, particularly those in the upper grades. Further research is needed to measure the effects of morphological interventions with students who face stacking risk factors such as Latino ELs with LD of low socioeconomic status above grade 3.

In summary, in order to fully comprehend text read or heard, students must be able to understand vocabulary using background knowledge to make relevant connections with the text (August et al., 2010). The ability to implicitly learn vocabulary is not easily acquired for some students, particularly ELs with language-based disabilities (Klingner, 2012). Vocabulary instruction, which has been used to promote comprehension in Latino ELs and those with language-based disabilities, include explicit instruction of morphemic analysis and word learning strategies to maximize vocabulary growth of Latino ELs.

Multicomponent instruction for Latino English learners. A handful of studies with Latino ELs used similar methods noted above that combined strategies that are promising. Carlo et al. (2004) examined the effects of teaching 254 fifth-grade native English speakers and Latino ELs (some of whom were children of migrant farmers) academic vocabulary and strategies for inferring word meanings across a 2-year evaluation. Specifically, the authors aimed to test the impact of an English vocabulary intervention in word learning strategies on outcomes for ELs compared to English-only speaking peers. The instruction was organized around a social studies unit that lasted from 30 to 45 min per day, 4 days per week. The intervention involved introducing 12 vocabulary words each week using a variety of strategies, such as charades, 20 questions, and discussions about Spanish cognates, word webs, and word association games. Further, the instruction involved repeated exposure to the words and consistent practice. The fifth week was devoted for review of the target words learned in culmination of the previous 4 weeks. The intervention was organized around the topic of immigration; specifically, readings from newspapers, first-hand accounts from immigrants and historical and fictional readings were included. The students were given all readings in text format with an audio

book version. The researchers believed that the development of the students' strategic knowledge was equally important as teaching individual words and thus provided explicit instruction in using context to infer word meanings. The students in the experimental group were taught in one 5-week unit and two 6-week units in the first year and three 5-week units in the second year. Students in the control group continued learning without special instruction. Results revealed that the intervention classes demonstrated greater growth, both for Latino ELs and English-only peers compared to those participants in the control classes in knowledge of the target words. The authors concluded that direct vocabulary was effective for all participants regardless of linguistic status.

This study by Carlo et al. (2004) is important because the authors used multiple strategies that are effective for students with LD and Latino ELs in instructional delivery, including explicit instruction, multiple examples (e.g., word association games) and opportunities to practice (e.g., peer-discussions, role-play), intensive instruction, and supplemental materials (i.e., graphic organizers [e.g., word webs], texts with targeted vocabulary, and provided audio supports). In addition, one specific strategy that can be directly attributed to the Latino ELL population in this study was the use of Spanish cognates of taught vocabulary. The authors determined that this was an important feature that was only provided to the Spanish-speakers to better support full comprehension of the taught vocabulary.

In another study, Silverman (2007) investigated the word learning of English speakers and Latino ELs across five classrooms. Instruction involved teacher read-alouds, explanation of target words in child-friendly terms, multiple examples of the words in different contexts, use of visual aids, practice pronouncing and spelling the words,

comparing and contrasting the meaning among synonyms, and providing scheduled review of the word meanings over a 14-week span. Results indicated that both English speakers and Latino ELs learned the meaning of the novel words at the same rate; however, Latino ELs showed a faster rate of overall general vocabulary growth compared to their English speaking peers. The authors concluded that the combination of the explicit vocabulary instruction with read-alouds provided more opportunities for the participants to hear the vocabulary in different contexts. This study supports suggestions by Beck et al. (2002; 2013) that read alouds, particularly those above a student's independent reading level, provide additional exposure to sophisticated language that these students may not otherwise get if not through read alouds.

More recently, Lesaux, Kieffer, Faller, and Kelley (2010) taught 476 sixth-grade students, 70% of whom were Latino ELs, academic vocabulary and strategies for inferring word meanings across an 18-week intervention. The instruction was organized around 2-week units that cycled on an 8-day lesson and lasted 45 min per day. The intervention was a text-based academic language program designed for students to acquire vocabulary knowledge incrementally over time by providing multiple exposures to the taught words across a variety of contexts. The measures identified for the study were target words for mastery, morphological decomposition, word meanings in context (of a story), and target word associations. Results revealed the strongest correlated measures were target words for mastery and morphological decomposition showing that with more than 99% confidence, these two factors increased vocabulary knowledge acquisition of the participants. The word meanings in context variable was also statistically significant, but to a lesser extent ($p < .005$). However, it should be noted that

the participants were required to read longer passages while using contextual and morphological analyses accurately to gain an overall meaning of the passage. Lesaux and colleagues asserted from their findings that vocabulary instruction extending beyond teaching simple definitions, such as teaching multiple meanings of words and morphological analysis showed potential to intensely increase vocabulary knowledge with deeper meaning and breadth of vocabulary of at-risk students in upper grades.

These findings raise implications that improving vocabulary and overall reading outcomes of at-risk students and Latino ELs is essential and additional research is warranted to investigate the effects of vocabulary instruction to address the needs of Latino ELs with LD. Additionally, further research is needed to investigate the unique culturally responsive instruction that can enhance specially designed vocabulary instruction addressing contextual and morphological analyses to improve academic outcomes of Latino ELs with LD.

Culturally Responsive Instruction

Previous research has indicated that culturally responsive teaching approaches have had a powerful effect on Latino ELs' reading skills and knowledge acquisition. Klingner et al. (2012) suggested that culturally responsive teaching is essential because it provides cognitive determinants (e.g., instructional engagement, contextualization, oral language development, and collaboration) to support Latino ELs in several ways. First, it involves direct and explicit instruction that provides modeling and oral language development with evidence-based reading components drawn from Latino ELs' relevant background knowledge and native language (e.g., August & Hakuta, 1998; August & Shanahan, 2006). Second, culturally responsive teaching provides questioning support

that assists students in answering questions about reading passages, offers feedback to students regarding their answers, and provides opportunities for students to ask and answer questions about challenges they encounter during reading (Jiménez, García, & Pearson, 1995; Kamps et al., 2007). Finally, culturally responsive teaching provides engaging and motivating collaborative practices, which not only get students involved in all reading activities but also allow students to participate in skills-based instruction in peer tutoring or small group format (e.g., Calhoon, Al Otaiba, Greenberg, King, & Avalos, 2006; Klingner & Vaughn, 1996; Sáenz et al., 2005).

Despite the potential effectiveness of culturally responsive instruction, defining culture is complex. In most research studies, culture is described in terms of an individual's race, ethnicity, native language, disability, or socioeconomic status (Sugai, 2012). However, each of these elements of culture is certainly multifaceted. Cultural factors can include individual, family and community, and school variables and how these intersect and interact (Cartledge, Singh, & Gibson, 2008; Harris, Baltodano, Artiles, & Rutherford, 2006). Ladson-Billings (2001) describes culture as the interaction among ethnicity, native language (vocabulary, syntax, dialect), and socioeconomic factors (eligibility for free and reduced lunch). Ladson-Billings adds that family and community culture overlaps with culture of a person which includes the home environment (e.g., quantity and quality of literacy and education, literate models, acceptable behavior, literate habits and models, home and school communication), the community environment (e.g., benefits of reading and writing, priority of reading in relation to other factors), and the school environment (e.g., number of schools attended, methods of instruction, school attendance, teacher expectations) as a means of understanding culture.

In an attempt to untangle the complications associated with defining culturally responsive instruction, Sugai, O'Keefe, and Fallon (2012) derived a definition of culture that is observable and has potential to be operationally applied. Sugai and colleagues' definition of culture is:

…the extent to which a group of individuals engage in overt and verbal behavior reflecting shared behavioral learning histories, serving to differentiate the group from other groups, and predicting how individuals within the group act in specific setting conditions [and that culture emulates] a collection of common verbal and overt behaviors that are learned and maintained by a set of similar social and environmental contingences (i.e., learning history), and are occasioned (or not) by actions and objects (i.e., stimuli) that define a given setting or context (p. 200).

Using Sugai and colleagues' (2012) definition of culture helps to guide the development of an observable definition of culturally responsive instruction, termed by these authors as culturally and contextually relevant. The basic notion of culturally and contextually relevant instruction is that instruction (e.g., delivery and/or materials) should be modified or changed based on the nonconforming overt behaviors an individual displays or does not display within a particular context (Fallon et al., 2011). One possible obstacle that may have delayed the process of operationally defining culture and culturally responsive instruction is multitude of cultures and contexts and interactions between and within what an individual may encounter throughout his or her life. For example, a group of students who share the same ethnicity (e.g., Latino) may not share many other cultural aspects (e.g., language proficiency, reading ability, socioeconomic status, age, sex) and even more unlikely within that same context (e.g., classroom,

teacher, genre of book). Despite the difficulties in defining culturally responsive instruction, many researchers who are chief promoters of culturally responsive literacy instruction have made dramatic contributions to the field of culturally responsive instruction for ELs with and without disabilities (see Gay, 2000; Gersten & Baker, 2000; Ladson-Billings, 1995; Moll et al., 1992; Nieto, 1999; 2002; Ortiz, 2001; Rogoff, 2003).

In this section, specific features of culturally relevant instruction that pertain to vocabulary instruction will be provided. The focus is to identify key instructional elements that are effectively unique for Latino ELs with LD in order to isolate strategies that make learning easier for Latino ELs with LD different from non-Latino ELs with LD.

Culture and literacy. An important task of reading is the ability to figure out, at least a vague understanding of unknown words of unknown words to fully comprehend (Snow, 2010). As stated previously, this is often a difficult task for many Latino ELs particularly those with LD (Manyak, 2010). This in part may be contributed to the way in which Latino ELs are taught in U.S. schools. For example, many of our Spanish-speaking students are taught to communicate in both oral and written form and in English without any support of their native language (August & Shanahan, 2010). Suggestions by Klingner et al. (2012) include what students know about language and reading to make learning English a little easier.

Framework for cognates. Studies indicate that second-language readers are able to transfer procedural knowledge (i.e., knowing how to read and write) and declarative knowledge (i.e., knowing content) from their first language to the second language because this has been previously learned (Bialystok, 1991; Collier, 1992; Garcia, 1994; Genesee, 1994). Students neither need to learn to read and write again when they learn a

second language, nor do they have to relearn all the content they learned in the first language. Hakuta and Snow (1986) stated that because skills can be transferred across languages, children should be taught to read first in their first language. Ferris and Politzer (1981) stated that students who received some first language reading instruction performed at least as well as their peers who received only second-language reading instruction. This is supported by Haddad (1981), who argued that first-language readers were more likely to become literate in a second language than their non-reading counterparts. It seems that first-language readers were able to transfer literacy skills from the first language to the second language, whereas first-language nonreaders had a distinct disadvantage in having to learn to read in a language that was unknown or only partially known.

All second-language learners know something about language from knowing their first language. For example, Justice and Turnbull (2013) explain that ELs know that meaning in language is based on context, that language is influenced by audience, and that language is often represented symbolically through print. If these same learners are literate, they are aware of audience, conventions of print, graphophonic relationships, syntax, text structures, and purposes for literacy events (Hakuta & Snow, 1986).

Krashen (1988) argued that the key to learning a second language was the use of language that is interesting and relevant. In addition, Krashen stated that language needs to be comprehensible and slightly beyond the student's present level of second language competence. According to Hornberger (1989), there are many similarities between languages and a continuum exists between languages based on the similarity, or lack thereof, between them. The similarities between any two languages may vary according

to whether or not they are in the same language family, and share the same alphabet. Hornberger also pointed out those languages that share many linguistic relationships may transfer more readily than those with fewer linguistic relationships. The similarities between English and Spanish are many. One of the most apparent similarities is found in their use of the Roman alphabet. In addition, they also share many cognates. Richards, Platt, and Platt (1992) defined a cognate as "a word in one language which is similar in form and meaning to a word in another language because both languages are related" (p. 59). Richards et al. provide seven types of cognates that include the following.

1. Words that are spelled identically in both languages (e.g., fatal, hotel, actor)

2. Words spelled nearly the same (e.g., *contamination-contaminación*; *evidence-evidencia*)

3. Parts are similar but not as evident (e.g., *sport-deporte*; *perilous-peligroso*)

4. Words that are more closely related by sound than by sight (e.g., *pleasure-placer*; *peace-paz*)

5. Words that are cognates for one meaning but not the other (e.g., *letter-letra* [an alphabet letter]; *letter-carta* [written letter])

6. Words that can be taught to help teach other words (e.g. *disappear-desaparecer*; *appear-aparecer*)

7. False cognates, which may sound or look similar but do not share the same meaning (e.g., *bogote-moustache; embarazada-pregnant*)

Understanding the different types of cognates is important in developing culturally relevant instruction. It is through explicit reading instruction with the use of

cognates that can enhance teaching Spanish-speaking students English through the use of first language support (Gersten & Baker, 2000).

Research to practice. Krashen (1985) emphasized the importance of creating language learning input for ELs that is most comprehensible or easiest to understand. Intervention studies that have effectively increased vocabulary knowledge of ELs have incorporated a wide variety of materials and practices to address the specific needs of the students. These practices are directly related to notions of the previous section and have been categorized into two types. One type of three components includes strategies that make the language of instruction more supportive, such as providing (a) text previews, often in students' first language before reading a text in English (Carlo et al., 2004), (b) high-interest texts (Carlo et al., 2004), and (c) visuals or multimedia texts to support access to text content (August et al., 2009; Proctor et al., 2011; Vaughn et al., 2009).

The other type of support is specific to the taught target words themselves, such as providing translations of the words being taught or drawing attention to cognates (Carlo et al., 2004; Proctor et al., 2011). Some Latino ELs are able to transfer cognate knowledge from their first language (i.e., Spanish) to English and to infer the meaning of unknown words. But this ability seems to affect comprehension only if students are both adept at recognizing cognate relationships and knowing the meaning of the word in Spanish (Helman, Bear, Invernizzi, Templeton, & Johnston, 2014). Explicit instruction using cognates can help Latino ELs become proficient at recognizing cognate relationships, which in turn may bolster vocabulary learning and comprehension in English. One nonexperimental study by Lubliner and Hiebert (2011) examined words on

the academic word list (AWL) created by Coxhead (2000) and found that 75% or 426 of the 570 headwords from this list shared cognates with Spanish.

Recently, Beck et al. (2013) suggests ways to bolster vocabulary learning for Latino ELs that takes advantage of cross-language relationships and may provide an alternative when direct cognates are not applicable. The authors suggest sorting words by families of meaning in order to infer the meaning of an unknown word using morpheme knowledge. For instance, word roots, such as "min," which is from a Latin word meaning small, and that is found in *diminish*, *minute*, and *minimum*. The study of roots could promote students' semantic networks between words related in meaning, and strengthen students' knowledge for each word that shares the root (Snow & Kim, 2007). Exploiting roots would also allow broader effects than focusing on cognates alone, although many cognates are nearly identical in meaning and appearance. Beck et al. explained that the relationship between the English and Spanish words is much more extensive and by definition, words have a cognate relationship when they share a root. In the case of English and Spanish, this is nearly always a Latin root. Beck and colleagues propose that accessing the related meaning in English and Spanish via the Latin root holds potential for learning many more academic words in English than has been previously studied. Considering the vocabulary needs of Latino ELs with LD, these recommendations play important roles in the current study.

Summary

A growing body of research suggests that systematic attention to the visual cues of word meaning and to the semantic relationships among words can support students' vocabulary growth and understanding (Beck et al., 2013; Bowers & Kirby, 2010; Leong,

2000; Smith, 1998). The line of research of morphological knowledge helps to identify the importance of attending to morphology through systematic instruction to support students in exploring the relationship between the spelling or visual representation of words and their meaning. When teaching Latino ELs with LD, instruction that includes culturally responsive features is important; however, empirical literature on culturally responsive vocabulary instruction for Latino ELs is scant. One supported culturally responsive feature of instruction effective and specific to teaching Latino ELs is providing native language supports, such as cognates of taught vocabulary in addition to English that share similar topography and morphemic meaning (Beck et al., 2013). An implication suggested by Beck et al. (2013) is to teach word roots and morphographs that provide opportunities to multiply the number of word combinations and vocabulary knowledge acquired, therefore maximizing the breadth and depth of vocabulary that can lead to improved reading comprehension. This study will incorporate culturally responsive vocabulary instruction that uses morphological and context analyses to maximize vocabulary acquisition of Latino ELs with LD.

<div align="center">Peer-Mediated Instruction for Academic Learning</div>

One evidence-based practice that has the potential to increase academic vocabulary with very little additional responsibility of the teacher is peer-mediated instruction. Peer-mediated instruction or peer tutoring is defined as a systematic instructional strategy in which one student (i.e., the tutor) has responsibility for teaching another (i.e., the tutee; Greenwood, Carta, & Hall, 1989) that has shown to benefit both students (see Cohen, Kulik, & Kulik, 1982; Rohrbeck, Ginsburg-Block, Fantuzzo, & Miller, 2003). Extensive research has been conducted on peer tutoring in multiple states

around the country for over 30 years (Maheady & Gard, 2010); it has shown to produce positive academic and behavioral effects across a variety of content areas (e.g., reading, math, spelling, social studies, science, health, physical education, foreign languages), developmental levels (e.g., low-, average-, and high-performing students), grades (e.g., elementary, middle, high school), and educational settings (e.g., general, remedial, special education classrooms; Bowman-Perrott et al., 2013; Maheady, Harper, & Mallette, 2001; Maheady, Mallette, & Harper, 2006; Stenhoff & Lingugaris/Kraft, 2007).

Research addressing academic learning using peer-mediated instructional formats has shown to not only significantly improve student academic performance on both content-specific and standardized measures of achievement (e.g., Greenwood, & Tapia, 2007; Maheady & Gard, 2010), but also enhance interpersonal interactions among diverse students, including at-risk learners (e.g., Madrid, Canas, & Ortega-Medina, 2007), students with disabilities, and their typically developing peers (e.g., Sideridis et al., 1997). The most compelling empirical support for peer tutoring came from a 12-year experimental longitudinal study by Greenwood, Delquadri, and Hall (1989). In this study, researchers compared groups of at-risk and non-risk students in a control group experiment. The authors found that peer tutoring (a) increased students' active engagement during instruction in Grades 1 to 3, (b) improved student achievement at Grades 2, 3, 4, and 6, (c) reduced the number of peer tutoring students in need of special education services by Grade 7, and (d) decreased the number of students who dropped out of school by the end of Grade 11.

Origin, Theoretical Foundation, and Variations of Peer Tutoring

Origin. Peer-mediated instruction was initiated as Class-Wide Peer Tutoring (CWPT) which is an intraclass, reciprocal peer tutoring strategy that has been shown to be an effective practice for more than 30 years (Delquadri, Greenwood, Whorton, Carta, & Hall, 1986) and has evolved in the process. Peer tutoring was initially developed by the Juniper Gardens Children's Project at the University of Kansas and emerged from collaborations among educational researchers and a classroom teacher who was trying to successfully integrate children with LD into her general education setting (Delquadri, Greenwood, Stretton, & Hall, 1983). The peer tutoring program allowed teachers to simultaneously engage all of their students in academic tasks for 30 min per day in three focused subjects (i.e., reading, writing, and spelling). The program was shown to be effectively implemented across first- through sixth-grade classrooms and was used between 3 to 5 days per week in the study. Based on the need for an effective program that was feasible for the teacher to use without taking quality instruction away from other children in the class, the program was created with the intent to (a) not create extra work for the teacher, (b) benefit all students in the class, (c) allow for the program to embed within the materials and resources that were available, (d) supplement rather than replace current instruction, and (e) be conducted within existing instructional time periods (Delquadri et al., 1983). These flexible and noninvasive characteristics made peer tutoring an attractive instructional option for teachers (Maheady et al., 2006). Since the 1980s, variations of peer tutoring have emerged, including: (a) peer-assisted learning strategies (PALS; Fuchs, Fuchs, Mathes, & Simmons, 1997), (b) The Ohio State START Tutoring Program (Heron, Heward, Cooke, & Hill, 1983), (c) classwide student tutoring teams (CSTT; Harper & Maheady, 1999), and, (d) reciprocal peer tutoring (RPT;

Fantuzzo & Ginsburg- Block, 1998). These variations of peer tutoring stem from the same foundation of theory that is described in the following section.

Theoretical foundation. As the original peer tutoring model, Juniper Gardens' peer tutoring has its theoretical foundations in the effective instruction (Brophy, 1986; Wyne & Stuck, 1979) and eco-behavior analysis (e.g., Greenwood, Delquadri, Stanley, Terry, & Hall, 1985) studies. Effective instruction theorists emphasize the importance of time allocated for students to actively respond during learning and attribute this as important predictors of student learning and performance. Conversely, effective instruction theorists argue that educators can change and increase student learning, and that particular instructional practices are more effective than others in achieving expected outcomes. Theorists of this framework are grounded by two notions: (a) as time and number of active student responses increase and are maintained with high levels of student success (e.g., >80%), student achievement will increase unrelated to variables (e.g., socioeconomic and cultural status); and (b) the systematic arrangement of instructional variables are capable of ameliorating and likely prevent learning failure (Brophy, 1986; Wyne & Stuck, 1979). Peer tutoring essentially connects these instructional variables into a format that actively engages all participating students simultaneously, provides immediate positive and corrective feedback, and offers contingent rewards for improved academic performance (Greenwood, Horton, & Utley, 2002).

Eco-behavioral analysis emerged from the field of applied behavior analysis (ABA) that emphasizes the importance of contextual factors (e.g., physical classroom arrangement, instructional materials, and behavior of the teacher) and the interactions

with student behavior (Greenwood, Carta, & Atwater, 1991). Initially, behavior analysts had focused mostly on the important correlations between student behavior and environmental consequences (e.g., reinforcement, punishment, extinction). Yet, observational research has found that many students continued to perform poorly if not provided the opportunity to actively participate (i.e., overt behaviors; [e.g., say, write, draw, read aloud]; Greenwood et al., 1985). Researchers of this notion demonstrated that students who were at risk academically (e.g., students with LD and ELs) were actively responding less than 6 min per day, which was alleged to attribute to the continuation of poor academic performance (Greenwood, Arreaga-Mayer, & Carta, 1994). Peer tutoring offered a viable option to engage all students during learning and provided students opportunities to be continuously monitored, receive error correction procedure for incorrect responses while ensuring success and receiving positive reinforcement (e.g., praise). With the practice of reciprocal tutoring, both students experience and benefit from peer tutoring academic tasks (Veerkamp, Kamps, & Cooper, 2007).

Class-Wide Peer Tutoring. The Class-Wide Peer Tutoring (CWPT) Program is a procedure that the students in a general education classroom are organized into tutor-tutee dyads (pairs) and learn together as a team to compete with other dyad teams within the classroom. Points are awarded to tutees for responding to a particular task presented by the tutor.

Greenwood, Delquadri, and Carta (1988) described the essential procedures of CWPT including: (a) teacher planning and gathering of materials that has an introduction of the lesson; (b) clarification of content materials to be tutored in each session; (c) rearrangement of partners weekly; (d) students serving as both tutors and tutees (i.e.,

reciprocal roles) within each session; (e) grouping of students into teams that compete for points; (f) tutee point earning with strict guidelines of how points are awarded; (g) tutors providing immediate error correction; (h) visible posting of individual and team scores, and (i) a social reward for the team that wins. Fulk and King (2001) describe the benefits of CWPT including that (a) it is an effective practice across all academic areas, (b) students are actively participating, (c) it provides a structured format that benefits at-risk learners, and (d) students like learning with a peer. CWPT is supported by a number of theories and a lot of research indicating its effectiveness for a variety of students in different educational environments (Maheady & Gard, 2010). Buzhardt, Greenwood, Abbott, and Tapia (2007) noted that more than 35 empirical studies have been conducted to support the effectiveness of CWPT. Buzhardt et al. (2007) found that studies have included both single-case and between-group experimental designs. Research findings indicated that CWPT (a) significantly improved student academic performance on both curriculum-specific and standardized measures of achievement, (b) reduced disruptive behavior, and (c) improved interactions among students who were identified with disabilities and those from diverse backgrounds.

Peer-Assisted Learning Strategies. Peer-Assisted Learning Strategies (PALS) is a systematic program that has been most often used during reading instruction within the general education classroom (Fuchs et al., 2001); however, PALS has been used in other academic areas such as math and social studies from kindergarten to high school (Maheady & Gard, 2010). Fuchs et al. (2001) created PALS from adapting CWPT; therefore, many of the components are similar. For example, students are paired together, teachers are required to plan and train for appropriate implementation and PALS is

intended to be used for 25-35 min as an instructional strategy for 2-3 days per week. In developing PALS, Fuchs et al. created guidelines for grouping. The criteria for grouping direct teachers to identify specific skills that needed to be taught and then sort students by ability level. To form pairs, the teacher ranks students from highest to lowest reading achievement. To decrease the disparity of the reading ability of the pairs, the list is split in half. The first student listed on the first half of the list is paired with the first student on the second half of the list. According to Fuchs et al., the PALS program in reading incorporates three reading strategies: partner reading and retelling, paragraph shrinking, and prediction relay. In the PALS program, students are put into pairs and take turns being the tutor (coach) and the tutee. During partner reading and retelling, the stronger reader reads for 5 min, while the weaker reader serves as the coach by identifying errors, initiating correction procedures, and awarding points for each sentence read correctly. After the first student reads, the coach asks what he or she has learned. Students switch roles for the next 5 min and follow the same procedure; that is, the weaker reader reads the same material while the stronger reader serves as the coach. During paragraph shrinking, students generate main idea statements. The stronger reader reads one paragraph at a time. After reading each paragraph, the reader determines the main idea by responding to the following: "Name the most important 'who' or 'what' in the paragraph. Tell the most important information about the 'who' or 'what.' Say the main idea in 10 words or less." The reader receives one point for each correct response. The tutor uses a correction procedure to help the reader amend inaccurate main idea statements. The first reader reads and shrinks paragraphs for 5 min before students switch roles. The second reader does not read the same material. Prediction relay increases comprehension and

piques students' interest in the selection they are reading. Before reading half a page, the stronger reader has 2 min to predict what he or she might learn or what might happen. After reading for 5 min, the stronger reader has 2 min to evaluate the prediction. The students switch roles and follow the same procedure with new reading material.

Reciprocal peer tutoring. The different roles of the tutor or tutee create two types of tutoring: fixed and reciprocal. The first of these is certainly the most well-known (Duran & Monereo, 2005). One student is always the tutor and the other is always the tutee. In reciprocal peer tutoring, two or more students alternate as the tutor and tutee during a session or every other session. Reciprocal peer tutoring provides a structured format, in which students are responsible for monitoring and evaluating their peers when serving the role of tutor (Hott, Walker, & Sahni, 2012). It has the advantage that all students get to act both as tutors and tutees. Reciprocal peer tutoring was originated by Fantuzzo, King, and Heller (1992) for students who were identified as at risk, specifically in urban, low-performing schools. The original study included peers of the same age; these students were grouped into pairs with similar academic needs. Like the previous versions of peer tutoring, teachers train the students with the intended objective to keep both the tutor and tutee actively engaged with the academic process (Thurston, Duran, Cunningham, Blanch, & Topping, 2009). Research has indicated that when students act as both the recipient and the agents of peer tutoring, the intervention effects are greater than when students remain in a fixed role (serving only as tutor or tutee; Chapman, 1998). Duran and Monereo (2005) conducted a study using reciprocal peer tutoring on math performance of at-risk learners in three schools that served students identified as low socioeconomic status and reported that when students acted as both recipients and agents

of peer tutoring, the intervention was more effective than when students acted in a fixed tutor/tutee role (Chapman, 1998).

Peer Tutoring Studies on Reading

At-risk learners. Peer tutoring is an effective intervention for students at risk for reading failure, particularly students with mild disabilities and ELs. One meta-analysis of 50 qualifying studies conducted by Maheady, Harper, Sacca, and Mallette (1991) found peer-mediated instruction combined with reading instruction to be an effective practice and a powerful set of instructional options particularly for students with reading delays. Several years later, Utley and Mortweet (1997) extended the literature reviewed by Maheady and colleagues, supporting prior findings on student improvements in literacy outcomes of students with or at risk for mild disabilities. Similarly, recent findings from Vaughn et al. (2009) confirmed previous results and added that peer-mediated instruction can be an effective practice interwoven within planned reading comprehension interventions to increase reading achievement of students with mild disabilities. However, less is known of the effects of peer tutoring on Latino ELs.

Most recently, Bowman-Perrott, Davis, Vannest, and William (2013) conducted a meta-analysis that examined the effects of peer tutoring across 26 single-case research experiments that included 938 students in grades 1 through 12. The unique contribution of this review is that it is the first in almost 3 decades to examine outcomes for elementary and secondary students, address effect sizes with confidence intervals that were missing in the literature, review only single-case design, and examine potential moderators that has never been examined of single-case data using a common effect size metric (i.e., Tau U). All studies reviewed were published in peer-reviewed journals

between 1966 and 2011. The criteria established for this review included studies that (a) employed a single-case design, (b) systematically implemented and reported interobserver agreement (IOA) of at least 80% for a minimum of 20% of all observations, (c) demonstrated experimental control by at least three demonstrations of the effect across three separate situations in time, (d) included phases with at least three data points, (e) implemented peer tutoring as an intervention and measured the effects on an academic variable, and (f) included students in grades 1 through 12. Reported findings were that the majority of peer tutoring in single-case design research was implemented with males, Caucasians, African American students with disabilities ($n = 15$), those at risk for disabilities ($n = 12$), and were conducted in the general education setting ($n = 17$). After examining the overall effect size of students with LD and/or behavioral disabilities ($d = .75$), and those without disabilities ($d = .65$), the authors conclude that with 95% confidence that the effect size is true. Similar to group design findings, students with LD showed greater effects from the use of peer tutoring as an intervention compared to peers without disabilities. Moreover, the effect size is found to be moderately large, indicating peer tutoring to be an effective intervention for students with disabilities and consistent with previous studies that only reviewed group design research. The authors recommend that future reviews report treatment fidelity and criterion measures (e.g., number of sessions, time of instruction) in peer tutoring that could potentially serve as a moderator of student outcomes.

Latino ELs. An earlier but important study by Serrano (1987) was one of the first studies that evaluated the effectiveness of cross-level peer tutors on the acquisition of English for native Spanish-speaking students. Serrano examined the effects of native

English speaker peer tutoring on the oral language acquisition of ELs from migrant communities. The study included 42 students aged between 8-12 years in grades 3 through 5, specifically of Mexican and Mexican-American decent. Two groups were examined, including a bilingual tutoring group and English-only tutoring group. The comparison group received no tutoring intervention and continued to receive English-only instruction with general education peers in a whole-group, teacher-centered classroom. Participating ELs were administered a pretest, the IDEA Oral Language Proficiency Test I (K-6) (Ballard, Tighe, & Dalton, 1982, as cited by Serrano, 1987) that assesses syntax, comprehension, vocabulary, and verbal expression. Tutors who were not limited English proficient were divided into two levels; tutors grouped in the first level were "somewhat" proficient in both English and Spanish, and tutors did not speak Spanish were grouped in the second level. Tutors at each level were randomly assigned to one of three groups (i.e., comparison, control, and intervention). Overall, 12 students were assigned to the intervention group (i.e., received bilingual tutoring intervention); 13 students were assigned to the control group (i.e., English-only tutoring group), and 17 students were assigned to the comparison group (i.e., students did not receive tutoring). Students participated in the tutoring program for 3 months. Two versions of the program were examined: a tutoring group where the ELL tutee worked with a bilingual (proficient in both English and Spanish) student tutor and a tutoring group where the ELL tutee worked with an English-speaking tutor who did not speak Spanish. Students were assigned to their tutors based on age and grade level match. Tutoring took place daily for 20 min each session. A total of 37 sessions were implemented in the study for a total of 12.3 hours of tutoring. Tutoring focused on English language instruction and included

lessons on life skills (e.g., such as caring for a cut) and everyday tasks. For example, tutors introduced vocabulary, played a cassette tape that asked tutees to respond to directions and commands, and used a set of pictures to check for tutees' comprehension. Tutors received training in two 20 min sessions before tutoring began. The training included explanations and demonstrations of effective second language teaching, modeling instructions, prompting, asking questions, and the role of the learner to help tutors practice tutoring skills. In the analyses of the measured outcomes, this particular study had relatively small numbers of students in all conditions, notably smallest among the intervention group. The authors noted this as a limitation, which was suggested as a possible influence for the non-significant, moderating effects between the groups. However, small differences were shown between the tutoring groups and comparison group on receptive vocabulary and comprehension. The authors concluded by recommending peer tutoring as an advantageous instructional strategy to improve receptive language (i.e., comprehension) over expressive (i.e., syntax and verbal expression) of native Spanish speaking student and recommended future rigorous studies examine specific factors that can enhance peer tutoring as an instructional strategy.

Calhoon, Al Otaiba, Greenberg, King, and Avalos (2006) examined the efficacy of a supplemental peer-mediated instruction reading program on phonological and reading fluency skills of first graders ($N = 78$) who were in predominantly Hispanic Title 1 classrooms in New Mexico. Sixty-eight percent of the students were Hispanic, all were English speaking. Six classrooms were randomly assigned to either the peer-assisted learning strategies (PALS) program or a control condition. PALS students participated in a peer-mediated early literacy intervention three times a week for 20 weeks for a total of

30 hours. Reading fluency measures taken at fall, winter, and spring showed statistically significant differences favoring PALS on phoneme segmentation and nonsense word fluency. Additionally, results analyzed by ethnic subgroups (Hispanic and non-Hispanic) revealed a differential pattern of response to PALS intervention, indicating greater gains for Hispanic students. The authors suggest this study was of particular importance because it was the first to show promise of peer-mediated instruction on early reading skills with at-risk Hispanic students who were primarily bilingual.

Similarly, McMaster, Kung, Han, and Cao (2008) determined the effectiveness of Kindergarten Peer-Assisted Learning Strategies (K-PALS) for at-risk ELs. Five hundred nine kindergartners were participants in these classrooms. Of these, 22% were ELs (*n*=112).The authors compared 20 K-PALS ELs to 20 control ELs and to 20 K-PALS non- ELs on early reading skill acquisition, using a pretest-posttest control group design with matched samples. They also compared proportions of ELs unresponsive to K-PALS to ELs unresponsive to traditional instruction. In the study, the teachers implemented K-PALS four times per week for 18 weeks. Following intervention, analyses of covariance on posttest measures indicated that K-PALS ELs performed reliably higher than Control ELs on measures of phonemic awareness and letter sound recognition, and they performed similarly to K-PALS non-ELs. However, McMaster et al. did not sift data between ethnicity; almost half of the participants in each condition were Hispanic and Asian. The authors suggest enhancing K-PALS features for ELs by adding explicit instruction in vocabulary and oral language.

Latino ELs with LD. Peer tutoring empirical research with Latino ELs with LD is scant. To date, there were two empirical studies that incorporated peer tutoring with ELs

with LD. First, Saenz, Fuchs, and Fuchs (2005) conducted one of the few studies that included a peer-delivered reading program with ELs identified as having LD. The authors used a quasi-experimental design to investigate the effects of PALS on the reading comprehension skills of Spanish-speaking ELs. In this study, 132 students including those identified with LD in grades 3 through 6 of low, average, and advanced readers participated. The intervention was implemented three times per week for 15 weeks. Six classes were randomly assigned to the PALS condition and six assigned to the control condition. The measures included reading fluency and comprehension. Latino ELs were paired with students of all reading ability levels (i.e., low, average, high) and pairing of partners switched every third week. Within the dyads (pairs), both students served as tutor and tutee in a reciprocal tutoring format. The students who participated in the PALS instruction statistically significantly outperformed the participants in the control group on reading comprehension questions answered correctly across student groups after a 15-week intervention posttest. Notably, the largest effect size (i.e., $d = +1.03$; $p>.001$) was shown for ELs and students identified as LD. Large and moderate effect sizes that were not statistically significant were achieved for ELs with LD for words read correctly and correct words selected on a maze measure. It should be noted that this study met What Works Clearinghouse (U.S. Department of Education, 2010) strict criteria meeting evidence standards without reservations.

In the other study, Wright, Cavanaugh, Sainato, and Heward (1995) conducted reciprocal peer tutoring to teach Spanish vocabulary to 16 Latino ELs with LD. In this investigation, the students were enrolled in a modified Spanish class designed for at-risk foreign language learners. Six of the students had identified learning disabilities, and the

other 10 students were not identified with a disability. Wright et al. (1995) examined four

dependent variables: the number of Spanish words acquired, averages from weekly tests,

number of words maintained, and the responses on social validity data collected from

participants and teachers. The procedures involved conducting an initial pretest of 343

Spanish words to ensure that the words used were unknown vocabulary, followed by a

second pretest to confirm the words were unknown. During all pretests, an English-to-

Spanish translation was measured as the primary dependent variable. For example, the

students were presented with the English word table, and they had to write "mesa." Using

the peer tutoring guidelines (see Cooke, Heron, & Heward, 1983); tutors were trained in

four sessions. During practice, a three-step procedure was used. First, the tutor showed

each card (of a stack) for 2 s, and then showed the correct response to the tutee. Next, a 3

s delay was used for the tutee. Finally, during the third trial, a 5 s delay was initiated

before showing the correct response to the tutee. When the correct response was provided,

the tutee wrote the word, said the word, and spelled it aloud as an error-correction

procedure to give the tutor a chance to check for accuracy. When an incorrect response

was given, tutors focused the tutees' attention on that part of the responses that were

incorrect (e.g., wrong letter). Practice lasted 5 min, thereafter, tutees counted the number

of written practice trials that occurred. Next, testing was conducted without prompts.

Tutees wrote the correct Spanish word from the stimulus presentation by the tutor. In a

test of the tutors' ability to learn new words as a function of tutoring, tutors tested

themselves on their tutees' cards. Finally, two maintenance tests were administered. First,

a maintenance test was administered every week on the taught and learned words. If an

error occurred, the words were recycled to the system at the next opportunity. If it was

written correctly, it stayed in the maintenance pile. Second, using a 50-word sample of all maintained words, a cumulative maintenance test was administered at the end of the study.

The results showed that all students learned and maintained Spanish words. Further, they learned the words about as fast as the system permitted. For example, the students with LD learned about 7.5 words every 2 days; by comparison, the system as designed would only permit them to learn eight words per 2 days. Also, these students maintained 83% of their words on weekly tests. Results for the general education at-risk students were similar; they learned approximately 7.6 words per 2 days of peer tutoring. The data for the incidental component of tutor learning (i.e., the tutor learning the tutee's words without direct instruction) was relatively low. Wright et al. concluded that tutor review sessions might have boosted this result.

Summary

To correctly implement peer tutoring, the program must adhere to a systematic application to expect intended results. There are four essential components considered as fundamental for correct implementation of peer tutoring; these include (a) assignment and training of students to roles in the peer-mediated intervention configuration, (b) students instruct one another, (c) teachers monitor and facilitate all peer-mediated instructional groups in the classroom, and (d) structures are designed to increase academic as well as social goals for all students (Maheady et al., 2006). Additionally, to be most effective, students must be taught roles in the instructional episode; tutors are taught to be systematic, elicit responses, and provide feedback (Maheady et al., 2006). Although studies have included Latino ELs, little is known about the effect of peer

tutoring on Latino ELs with disabilities (Klingner et al., 2012). This study will use a peer

tutoring program that aligns to the evidence-based fundamental of implementation and

will use an experimental single-case research design that is intended to build a research

base for effective practices for Latino ELs with LD.

<center>Computer-Assisted Instruction for Reading</center>

The Association for Educational Communications and Technology (1977) defined

computer-assisted instruction (CAI) as a method of instruction that uses a computer to

teach students. The computer programming provides instruction that is designed to teach,

guide, and test the students until proficiency is attained. CAI, which arguably has its

origins in B. F. Skinner's fill in the blank teaching machines (Maris, 2005), has changed

drastically over the past several decades. The first CAI programs designed for public

schools began at Stanford University in the early 1960s, and this federally funded

initiative included instructional components in many subject areas (Atkinson et al., 1970).

Several important conclusions drawn from that research remain relevant to CAI today.

First, CAI was most effective as a supplement to, rather than a replacement for, the

classroom teacher (Atkinson et al., 1970). Second, effective CAI was developed from a

theory-based curriculum grounded in empirical research, and the curriculum guiding the

CAI needs to be consistent with the curriculum used within the classroom (Atkinson et al.,

1970). Finally, the most important benefit of CAI was that it could tailor instruction to

the needs of each student based on his or her responses, allowing instruction to be

individualized for each learner (Wilson & Atkinson, 1967).

According to Desrochers and Gentry (2004), the three main types of CAI are drill-

and-practice programs, tutorial programs, and simulation programs. Drill-and-practice

programs provide learners with exercises that reinforce specific skills learned in the

classroom much like traditional practice worksheets (Desrochers & Gentry, 2004; Soe et

al., 2000), but they have the advantage of providing learners with immediate feedback

and appear to be more motivating to students than traditional worksheets (Sivin-Kachala

& Bialo, 1998; Soe et al., 2000). Tutorials present new instructional material, test a

learner's knowledge of the material, and provide feedback to the learner (Desrochers &

Gentry, 2004; Soe et al., 2000). Tutorial programs are usually designed to tailor

instruction to meet the learner's needs based on his or her responses to questions within

the program (Soe et al., 2000). CAI simulations typically do not teach new material;

instead, they are designed to model realistic situations in which the learner responds and

receives feedback on his or her performance. Simulations may be effective for promoting

generalization of learning to natural situations (Desrochers & Gentry, 2004).

Regardless of the type of CAI, research in the area has identified several

important features in effective CAI. First, effective CAI provides explicit instruction that,

at a minimum, specifies instructional objectives that the program is designed to teach

(Desrochers & Gentry, 2004). Effective CAI also prompts desired responses through

means such as highlighting text or providing hints on the screen during initial instruction

and gradually fades the prompts as the learning occurs (Desrochers & Gentry, 2004).

Additionally, well-designed software in effective CAI presents information in multiple

formats; for example, providing some of the information to be learned through pictures,

while simultaneously providing audio, with or without text, presentation of supplemental

information results in improved learning (Mayer & Moreno, 2003). Another important

design feature of an effective software in CAI is active and frequent student responding,

which is essential in increasing both student engagement and the likelihood that the student will generalize learning to other situations (Kulik, 2003). Finally, providing immediate feedback regarding response accuracy, including providing the correct answer after each incorrect response is important (Desrochers & Gentry, 2004).

The appeal of CAI for reading, in particular, is the belief that well-designed computer programs have the potential to supplement instruction provided by classroom teachers in meaningful ways (Blachowicz et al., 2009; Hasselbring, 1986). Well-designed computer programs that incorporate both the elements of effective general instruction (e.g., explicit, strategic, and scaffolded instruction; high percentages of engaged time; high success rates; immediate, corrective feedback; and frequent reinforcement; Hall, Hughes & Filbert, 2000) and components of effective reading instruction as identified in research (e.g., NRP, 2000) are becoming available. These programs have the potential to teach students at their own pace, provide immediate feedback, increase motivation, and create tailored practice schedules that provide only the necessary amount of repetition (Cheung & Slavin, 2011; Soe et al., 2000; Torgesen, 1986; Wood, Pillinger & Jackson, 2010).

Computer-assisted Instruction in Reading

In recent years, the increased availability of computers, software, and other technology in schools has allowed researchers to investigate the effectiveness of CAI by grade level, subject area, and program type. For example, Macaruso et al. (2006) compared the reading performance of first grade students using computer programs designed to supplement regular reading instruction in an urban school system, with control group students receiving similar classroom instruction without the use of CAI.

Native English-speaking students without disabilities from 10 first grade classrooms across five schools in an urban school district participated in this study. One class in each school was assigned to the treatment group and a second class to the control group. There were 83 students in the treatment group and 84 students in the control group, with 15 students receiving Title I supplementary reading services in each group. All students received the same daily reading instruction, which included explicit phonics instruction. The students in the treatment group received between two and four weekly CAI sessions lasting from 20 to 30 min for a total of 6 months. Students in the control group spent this time receiving regular classroom language arts instruction. Preintervention and postintervention standardized reading assessments were administered to all participants. Results indicated that the posttest scores of the treatment group were greater, but not significantly greater, than the posttest scores of the control group. When analyses were restricted to low-performing students eligible for Title I services, the treatment group obtained significantly higher posttest scores than the students who were eligible for Title I services in the control group. These results support the hypothesis that explicit and intensive CAI can be beneficial for elementary-aged low-performing students at risk for reading difficulties.

Macaruso and Walker (2008), in a continuation of Macaruso et al. (2006) study, examined the benefits of drill-and-practice CAI designed to supplement regular, phonics-based reading instruction for kindergarten students in an urban public school system. Three kindergarten teachers and their six half-day kindergarten classes across two schools participated in the study. One class from each teacher was randomly assigned to the treatment group and the remaining three classes were assigned to the control group.

Classes in the treatment group used the Early Reading (Lexia Learning Systems, 2003)

software for two or three, 15- to 20-min sessions each week. Intervention sessions were

conducted in the schools' computer labs under the supervision of the classroom teacher

and computer lab staff. Teachers and lab staff were trained to implement the software.

Students who completed at least 45 intervention sessions were included in the final data

analysis. No student completed more than 62 intervention sessions during the 6-month

intervention period. Students in the control group participated in typical classroom

language arts instruction during the time that the treatment group received the CAI

intervention. Although no significant differences between the treatment and control

groups at posttest were found using the Phonemic Segmentation Fluency task on the

Dynamic Indicators of Basic Literacy Skills TM (DIBELS; Kaminski & Good, 1996),

students in the treatment group significantly outperformed the control group on the Oral

Language Concepts subtest of the Gates-MacGinitie Reading Test TM (MacGinitie,

2000), another measure of phonological awareness.

In another study, Mathes, Torgesen, and Allor (2001) investigated the effects of

DaisyQuest (Erickson et al., 1992) and Daisy's Castle (Erickson et al., 1993) on low

achieving first grade students who were already receiving the peer-assisted literacy

strategies (PALS) intervention. Thirty-six first grade teachers and their classes from eight

schools participated in the study. Twelve teachers implemented PALS-only, 12 teachers

implemented PALS plus the CAI intervention, and 12 teachers did not implement PALS

or CAI; the third group served as the control group. Teachers and their classes were

randomly assigned to one of the three treatment conditions, with the exception of six

teachers who had participated in the PALS intervention the year before and requested to

participate in PALS again. These six teachers were randomly assigned to either the PALS or PALS and CAI condition, and the matched classrooms from the same schools were included in the control group. In each of the PALS classrooms, students participated in the PALS intervention for 35 min each session, three times per week for 16 weeks. Students within these classrooms who were identified as low performing also participated in three 20- to 30-min CAI sessions each week for 8 weeks using the DaisyQuest (Erickson et al., 1992) and Daisy's Castle (Erickson et al., 1993) computer programs, in addition to participating in the PALS intervention. Results indicated that the PALS intervention enhanced reading performance, both in terms of statistical significance and in terms of educational relevance, achieving effect sizes that ranged from +.37 to +.74. The addition of CAI in phonological awareness did not affect student performance beyond the implementation of PALS alone. The authors note, however, that only the lowest achieving students, based on pretesting results, participated in the PALS with CAI condition, which provides an important alternate explanation of their insignificant findings.

Peer-mediated CAI in Reading

Cheung and Slavin (2012) provide suggestive evidence that linking non-technology classroom instruction and CAI could be beneficial, particularly for students with LD and ELs. Notably, peer-mediated instruction is one approach that is emerging with supportive evidence to improve reading outcomes of these two specific at-risk populations. For example, two widely used upper-elementary/early-secondary reading approaches using peer-mediated format, READ 180™ and Voyager Passport™ (Scholastic, Inc.) were supported by 18 studies with the largest effect size (i.e., d =+.28)

than any other CAI program for students with LD and ELs specific to reading

comprehension, word study, and vocabulary (Cheung & Slavin, 2012; Davidson & Miler,

2002). Both programs begin with CAI in reading with a modeled, guided, and

independent reading passage with explicit activities that focus on one of these three

reading strategies; immediately following, students proceed into peer-dyad or small

group instruction that is supervised by a trained teacher. A few of the benefits of this

particular peer-mediated CAI include: (a) the flexibility to customize content in varying

formats relevant to the students; and (b) personal representations of enhancements that

highlight, enlarge, animate, color-code, voice-embed to meet the needs of the learners.

Additionally, the flexibility allows for teachers to observe interactions between the tutors

and tutees, allows for dyads to pace themselves or a pace can be set for them, and

provides systematic application of scaffolding instruction. In other words, adding CAI

features with peer tutoring offers a multitude of flexibility for both the teacher and the

students, making it a popular and attractive instructional method for classroom use.

Other programs have emerged with similar program implementation design. For

example, Comaskey, Savage, and Abrami (2009) used the ABRACADABRA™

computer program, which focuses on letter-sound knowledge, phoneme blending, and

reading comprehension strategies, with early elementary-aged students, 15 of whom were

identified as having LD. The researchers grouped peers in dyads who were trained in a

reciprocal tutoring format, taking turns being the tutor and tutee and responding to the

program's audio output. Sessions occurred 3 days per week for 15 min each session.

Results showed that the participants improved their letter-sound knowledge, as measured

by students responding to the 26 letters of the alphabet presented in random order on a

page, and word reading skills, as measured by performance on the Wide Range Achievement Test Word Recognition Subtest. More recently, Chambers et al. (2011) examined the effects of small-group, computer-assisted tutoring compared to teacher-directed, one-on-one tutoring on the reading achievement of low-achieving first and second grade students. Participants attended one out of the 33 high-poverty schools selected to participate in the Success for All reading program. Students were randomly assigned to the computer-assisted tutoring group (i.e., Team Alphie™) or to the teacher-directed tutoring group (i.e., the control group). The students in the treatment group were provided instruction four times per week for 45 min each session. Instruction focused on decoding and fluency, and was aligned with classroom instruction. Similar to Comaskey et al. (2009), students worked in pairs to respond to the program's prompts. The control group received small group teacher-directed instruction for 20-min sessions four times per week. The Woodcock Reading Mastery Test™ (WRMT) Letter-Word Identification was conducted as pretest and posttest measures, and the WRMT Word Attack and Passage Comprehension assessments were conducted as posttest-only measure. Results showed that students in both the control and treatment groups made equal gains, suggesting that small group, computer-assisted tutoring was as effective as teacher directed one-on-one tutoring.

In addition to the group design studies presented above, studies existed that used a single-case research design to examine the effects of peer-mediated CAI on reading skills of at-risk students or ELs. Van Norman and Wood (2008) used a reversal design embedded within a multiple baseline design to determine the differential effects of a reciprocal peer tutoring program with and without a prerecorded sight word model on the

accuracy of tutor feedback with six kindergarten students at risk for reading difficulties. Students were taught the components of reciprocal peer tutoring and asked to tutor each other on unknown, phonetically irregular sight words. Each of the prerecorded sight words was presented on a tutoring card accompanied with a voice output and recording device, called Mini-Me™, that allowed the tutor to activate the recording, compare it to the word produced by the tutee, and to provide praise or error correction accordingly. Results indicated that the peer tutoring with prerecorded sight words produced higher percentages of accurate feedback when compared to the peer tutoring condition without the prerecorded sight words. Additionally, three of the six participants produced substantial increases in the accuracy of word identification from pretests to posttests.

Most recently, Wood, Mustian, and Lo (2013) used a multiple probe across students design to evaluate the effects of peer-mediated instruction on the phoneme segmentation fluency of four kindergarten students identified as "at risk or "some risk" for reading failure as measure on the DIBELS™ Phoneme Segmentation Fluency (Good, Kaminski, & Smith, 2002). The researchers used Microsoft PowerPoint® software to create the tutorials. Each tutorial slide consisted of two major parts, including (a) graphics from a clip art program to represent the targeted word and placed at the upper portion of the slide, and (b) four action images with embedded audio prompts, located at the bottom portion of the slide, for tutor instruction. The action images, displayed from left to right, included: (a) a picture of a smiley face holding its one hand to its ear for students to listen; (b) an image of a three or four red, separated boxes to represent the number of phonemes in the word (e.g., three boxes for "mop"); (c) an image of the three or four red boxes joined together with a black arrow striking through the boxes to prompt

for saying the whole word; and (d) a next arrow placed at the right lower corner of the slide to prompt the tutor to transition to the next slide. The primary experimenter made all of the audio recording using a digital recorder to voice say each phoneme slowly (e.g., segmenting each word [/h/ /a/ /t/]) and say the word at a normal rate). Both the smiley face and the joined boxes images were hyperlinked with the experimenter's voice saying the targeted word at a normal rate; whereas the separated boxes image was linked to the audio of the experimenter's saying each phoneme. Students were trained by the authors until they were able to successful implement the peer-mediated instruction procedure independently (without teacher redirection or input). Results of the study indicated a functional relation between the computer-assisted reciprocal peer tutoring intervention and improved phoneme segmentation fluency on three of the four participants. Notably, posttest DIBELS scores showed that all four students who participated in the computer-assisted reciprocal peer tutoring intervention were placed out of the "at risk" or "some risk" status; three students were considered "established" (meaning on grade level) for phoneme segmentation fluency skills by the end of this study.

Peer-mediated Computer-assisted Vocabulary Instruction

The majority of peer-mediated CAI programs in reading were designed for early literacy skills. Only two studies used peer-mediated CAI to improve vocabulary of students at risk or with disabilities (i.e., Anderson, Lo, & Bunch-Crump, 2014; Wood, Mustian, & Cooke, 2012). Wood et al. (2012) compared the effects of whole-word vocabulary instruction and morphograph instruction using CAI on students' vocabulary acquisition and generalization (i.e., untaught words). Researchers conducted 7-min instructional lessons of students using a peer-mediated CAI program with 8 seventh-

grade students with mild disabilities. The authors developed scripted lessons using the

Microsoft PowerPoint® software. Computer-assisted supports included scripted

instruction (e.g., scripts in blue font for tutor and scripts in red font for tutee), target

vocabulary words, example sentences, and clickable icons for audio recording of target

words and sentences. The primary experimenter trained all participants on the steps of

reciprocal peer-mediated instruction during three 15-min training sessions prior to data

collection. Specifically, the participants received step-by-step instructions for the role of

tutor and tutee in the peer-mediated CAI instruction program, including good tutoring

behaviors (e.g., speaking clearly) as well as how to give ample thinking time to the tutee

before responding. Data collection began when tutoring pairs demonstrated correct

tutoring behaviors. The experimenter used a vocabulary pretest to create a list of

unknown words to use in the first two sessions of the peer-mediated instruction program.

After every two peer-mediated instruction sessions, a third session (probe) was conducted

to evaluate the extent to which participants had learned the vocabulary words and

generalized the learning to untaught vocabulary words. Prior to the start of the next set of

tutoring sessions, another pretest was used to select unknown words for the next two

sessions. Approximately 400 words containing prefixes, suffixes, and word roots were

randomly selected to either whole-word or morphograph instruction. One fourth of these

words were directly taught in the tutorial program, and the remaining words were used as

generalization words during probes. Both the morphograph condition and the whole-word

condition were implemented within each session. The whole-word condition introduced

an unknown vocabulary word, asked the student to predict the meaning based on the

context of a sentence, and then provided the correct definition for the student to repeat.

The morphograph condition introduced the meaning of the morphograph (e.g., pre-) and asked the student to repeat the morphograph and its meaning. The student was then given a word containing that same morphograph and asked the student to use knowledge of the morphograph (word part) and the context to predict the meaning of the word in a sentence. The correct definition was then provided for the student to repeat. The tutoring program was set up so that each student acted as tutor and tutee for a total of four words each session. For each pair, one participant always acted as tutor for the first two words, and the other participant acted as tutor for the last two words. Every other session alternated between beginning with the explicit instruction of a morphograph or the implicit instruction of a whole word that contains a different morphograph. Each session also alternated between explicit and implicit instruction for all four words that were taught to control for sequence effects. In every session, two prefixes and two word roots were introduced. One prefix and word root were explicitly taught and the others were implicitly taught. Results from this study using a simultaneous treatment design showed that the participants benefited more from the morphograph instruction compared to the whole-word vocabulary instruction for both vocabulary acquisition and generalization.

Although explicit instruction delivered through a peer-mediated CAI program has shown positive effects for students with LD, only one study to date (Anderson et al., 2014) measured the effects of peer-mediated CAI in vocabulary instruction for student with LD who were also identified as native Spanish-speaking ELs. Anderson et al. expanded the concept of using CAI and peer-mediated instruction on vocabulary acquisition and generalization similar to the study conducted by Wood et al. (2012) with several variations. Anderson et al. simulated Wood et al.'s morphograph-only condition

and included native Spanish-speaking ELs with LD in fifth grade. The peer-mediated

CAI intervention, developed by the authors, was an explicit vocabulary program

delivered through Microsoft PowerPoint® presentation format. The technological

supports within the slides included color-coded instructions in scripted format and

response prompts, target vocabulary words with graphic representations, example

sentences with picture cues, and clickable icons for audio output of taught morphographs

and target words. The researchers targeted three prefixes (i.e., pre-, in-, and de-) for

instruction and collected data on the vocabulary acquisition (taught prefix and root word)

and generalization (taught prefix and untaught root word) every other session of the four

instructional sessions per week across a total of 14 weeks. Assessments included

definition of vocabulary acquisition and generalization in a fill-in-blank format (e.g.,

"predominant means_____") and inference of the target vocabulary words in a

multiple-choice format (e.g., "English is the predominant language taught in the school.

From this sentence, we can infer that English is the language less taught. [b] English is

the language most taught. [c] English is the language taught a little. [d] English is the

language not taught."). A multiple probe across morphographs design showed a

functional relation between the peer-medicated CAI morphograph instruction and

increased vocabulary knowledge of both acquisition and generalization vocabulary words

of all eight participants. Furthermore, the participants were able to maintain vocabulary

comprehension even after the intervention had ceased. Results of these studies by Wood

et al. and Anderson et al. suggest that vocabulary instruction using peer-mediated CAI

that entails minimal teacher support can improve vocabulary comprehension of at-risk

students including those identified as ELs with LD. Although Anderson et al. examined

important variables (i.e., general vocabulary and generalization) to include within a peer-mediated, computer-assisted vocabulary program tailored for ELs with LD, no effects on vocabulary acquisition specific to academic vocabulary were examined. Furthermore, no effects of culturally relevant instruction and assessments were examined. Future research is warranted to investigate the effects of infusing cultural relevance within the peer-mediated, computer-assisted vocabulary instruction on the academic vocabulary comprehension of at-risk students, particularly ELs identified as LD.

Summary

Research efforts for students with LD in literacy predicate the need for high quality instruction for other populations at risk, particularly ELs with LD. Given the English vocabulary deficit many Latino ELs experience when they begin school (Manis et al., 2004; Páez, Tabors, & López, 2007) and the sizeable vocabulary gap that older ELs continue to face (Cameron, 2002; Mancilla-Martinez & Lesaux, 2010; Proctor et al., 2005), scholars from the field recommend those who serve ELs and students with disabilities implement intensive vocabulary instruction across the grades. Beginning at third grade and increasingly through the middle school grades, vocabulary instruction should become multifaceted in nature, targeting specific words in order to invest some instructional time in other aspects of vocabulary knowledge, such as depth of word meaning and morphological elements (prefixes, suffixes, and root words), use of context to infer word meanings, and cognate knowledge (Carlo et al., 2004; Lesaux et al., 2010). In addition, vocabulary instruction should be connected to the reading of anchor texts. Such texts provide a meaningful context for introducing new words and applying word-learning strategies, a focus for rich vocabulary-oriented and content-oriented discussion,

and the opportunity to integrate vocabulary, reading comprehension, and content-knowledge instruction. Further, effective vocabulary should incorporate a variety of pedagogical strategies, including visual images and video clips to illustrate word meanings and build background knowledge, peer collaboration, graphic organizers, writing, and engaging game-oriented activities.

All the research reviewed in this dissertation has established that certain shared variables (e.g., explicit training, clear and systematic instructions, scaffolding, frequent monitoring during instruction, multiple opportunities for students to respond with immediate feedback) have increased academic outcomes of ELs and students with LD; however, limited research is available that included ELs with LD. Computer-assisted instruction and peer-mediated instruction are two instructional procedures that share these variables. The literature on peer-mediated CAI, which includes the components of effective instruction mentioned above, is well established for students with LD, particularly in literacy; however, the research base focusing on vocabulary instruction with ELs with LD is only emerging. One model of vocabulary instruction that holds promise for ELs with LD is peer-delivered, computer-assisted explicit vocabulary instruction. Although studies have shown the effectiveness of computer-assisted instruction, peer-mediated instruction, and explicit vocabulary instruction (Carlo et al., 2004, Lesaux et al., 2010); to date, only one study has shown that this combination can lead to improved academic vocabulary knowledge for ELs with LD (Anderson et al., 2014) and no study integrated cultural relevance into instruction to address the unique needs of ELs with LD. Further studies on this subgroup are needed in order to improve internal and external validity of the preliminary findings associated with peer-mediated

CAI on vocabulary learning, and to establish the evidence for culturally relevant peer-mediated CAI programs.

CHAPTER 3: METHOD

The purpose of this study was to evaluate the effects of a culturally relevant peer-delivered computer-assisted vocabulary intervention on academic vocabulary acquisition and generalization of Latino ELs with LD. This chapter provides information of the research method used to answer the research questions by describing the settings, participants, experimental design, procedures, data analysis, interobserver agreement, and procedural fidelity.

Settings

School. This study took place in an urban Southeastern public elementary school in a southeastern state of the United Stated. The school's student population totaled 582 students from prekindergarten to fifth grade. This school was selected because of the high percentage of Latino students. In 2014 demographic reports indicated the student population was approximately 63% Hispanic/Latino, 22% African American, 13% Caucasian, 1% multiracial, and > 1% Asian. Approximately 18% of students received special education services through an Individualized Education Program (IEP) and 46% of the student population had been identified as being Limited English Proficient (LEP), of which 22% of these students received English as a second Language (ESL) services. Ninety six percent of the student body were eligible for free and reduced lunch, which qualified this school to receive Federal Program Assistance through Title I funds.

Instructional setting. All training, data collection, and intervention sessions took place in an unoccupied conference room that had a projector and a laptop computer with a wired mouse. Intervention lessons and data collection sessions were conducted 4 days per week. During each instructional session, one peer tutor-tutee dyad, the experimenter, and periodically a second data collector were present. All computer-assisted lessons were displayed via an overhead projector and were delivered during a 30-min block that was scheduled purposefully to avoid interference with academic instructional time. During each peer-delivered instructional session, students were seated across the table facing each other. The tutor was seated in front of the laptop that was connected to the overhead projector; the scripted lessons were projected on a flat beige wall, free from distractions (e.g., windows, pictures, charts) to ensure each lesson could be viewed clearly by the tutee.

Participants

Six Latino ELs with LD participated in the study based on teacher nominations and inclusion criteria. All six participants served as both tutors and tutees during the peer-delivered intervention sessions, alternating roles as tutor and tutee for each instructional session.

Selection criteria. Two fifth grade teachers and one fourth grade teacher had students who met the inclusion criteria and whom they recommended as indicated by completing a brief form that identified students who performed at least one grade level below their assigned grade in reading comprehension skills, as determined by a current score of the Developmental Reading Assessment®, Second Edition (DRA™2; Beaver & Carter, 2009), a reading assessment used by this school system that determines student's

instructional level with an evaluation of reading engagement, oral reading fluency and comprehension. A total of six students identified by their teachers were selected for participation according to the following criteria.

1. Identified by the school as upper elementary (i.e., 4th or 5th grade) Latino ELs under the age of 13 years, gathered from each student's cumulative file that included a home language survey that designated Spanish as the primary language spoken in the home

2. Scoring a Level 2 or 3 on all four subtests on the ACCESS for ELLs® English Language Proficiency Test created by and aligned with the World-Class Instructional Design and Assessment Consortium (WIDA™; Gottlieb 2004), a state-approved oral-language proficiency test

3. Identified as LD based on the federal and state's eligibility determination guidelines and has a current IEP that includes at least one vocabulary and/or reading comprehension annual goal with short term objectives

4. Parents providing written parental consent to participate (sent in English and Spanish [see Appendix M]); and

5. Students providing written assent to participate (see Appendix N).

Measures for participant selection. Three measures were used to select the participants; two were informal measures (i.e., review of each nominee's current IEP goals and objectives and home language survey and one formal measure (i.e., ACCESS for ELLs ®). Once parental consent was granted, informal measures occurred first to validate that students were in fact upper elementary Latino ELs with LD and Spanish as the predominant language spoken in the home. Thereafter, the experimenter administered

the standardized measure, ACCESS for ELLs®, to each potential participant during separate testing administration sessions. The formal assessment is described below.

WIDA's ACCESS for ELLs. The ACCESS for ELLs® English Language Proficiency Test (Gottlieb, 2004), a product of WIDA™, is a series of English language proficiency assessments for students in kindergarten through grade 12 that yields valid and reliable results with a weighted reliability score of .934 across tiered language measures (i.e., listening, speaking, reading and writing). ACCESS for ELLs® English Language Proficiency Test was designed to align to the English Language Proficiency (ELP) standards, for which the Teaching English Standards of Learning (TESOL; 2006) adapted to form the bases of their ELP standards. Educators often use this assessment as an identification/placement assessment for newly enrolled ELs or as an interim progress monitoring assessment. The WIDA framework recognizes the continuum of language development within the four domains with six English language proficiency levels. (1-Entering, 2-Emerging, 3-Developing, 4-Expanding, 5-Bridging and 6-Reaching). Proficiency level scores are presented as whole numbers followed by a decimal. These levels describe the spectrum of a learner's progression from knowing little to no English to acquiring the English skills necessary to be successful in an English-only mainstream classroom without additional support. The final, exit stage for EL status is designated as Level 6 (formerly ELL). Within each combination of grade level, content area, and language domain, there are proficiency indicators that are intended to describe a logical progression and accumulation of skills on the path to full proficiency. Students in this study were selected to participate in this study by scoring a level 2-Emerging or 3-Developing in all four domains.

Participants. Pseudonyms are used for all participants' names. The six participants included Andres, Amelio, Benito, Brando, Christian, and Cortez. All participant information provided in narrative form is also provided in Table 1.

Andres was an 11-year-old fifth grade Latino male born in the United States and identified as having a specific learning disability in reading and writing. He was eligible for the state's alternate assessment based on modified achievement standards for reading, and received extra testing time and small group separate room as testing accommodations. Andres participated in general education classes for the majority of the school day where he received consultative support from English as a second language (ESL) teacher that included monthly check-ins and annual language assessments. Andres was provided specialized instruction from a special education teacher in a resource classroom for one hour per day 5 days per week to work on his IEP goals that included reading fluency, comprehension, and receptive and expressive language skills. Andres' DRA™2 (Beaver & Carter, 2009) score indicated an overall reading proficiency level expected at the end of third grade prior to beginning intervention. Andres completed the state approved English language proficiency test, WIDA™ (Gottlieb 2004), in fall of 2013. He scored at a level 3 (Developing) in the areas of Speaking, Listening, and Reading and scored at a level 2 (Emerging) in the area of Writing. Andres' general education and specialized instruction did not include direct vocabulary instruction.

Amelio was also an 11-year-old fifth grade Latino male born in the United States who was identified as having a specific learning disability in reading and writing. Amelio participated in the state's alternate assessment based on modified achievement standards for reading, and received small group separate room and extra testing time as testing

accommodations. Amelio attended general education classes for the majority of the school day and received consultative support from an ESL teacher that included monthly check-ins and annual language assessments. He received specialized instruction in a resource classroom for one hour per day, 5 days per week to work on his IEP goals in the areas of reading fluency, comprehension, receptive and expressive language skills. Amelio also received consultative speech/language services twice per month for 30 min. Amelio's DRA™2 (Beaver & Carter, 2009) score indicated an overall reading proficiency level expected at the end of third grade prior to beginning intervention. Amelio completed the state approved English language proficiency test, WIDA™ (Gottlieb 2004), in fall of 2013. He scored at a level 3 (Developing) in the areas of Speaking, Listening, and Reading and scored at a level 2 (Emerging) in the area of Writing. Amelio's general education and specialized instruction did not include direct vocabulary instruction.

Benito was an 11-year-old fifth grade Latino male born in the United States with a specific learning disability in reading and writing. Benito participated in the state's alternate assessment based on modified achievement standards for reading, and received small group separate room and extra testing time as testing accommodations. Benito attended general education classes for the majority of the school day and received consultative support from an ESL teacher that included monthly check-ins and annual language assessments. He received specialized instruction in a resource classroom for one hour per day, 5 days per week to work on his IEP goals that included reading fluency, comprehension, and written language skills. Benito's DRA™2 (Beaver & Carter, 2009) score indicated an overall reading proficiency level expected at the end of third grade

prior to beginning intervention. Benito completed the state approved English language proficiency test, WIDA™ (Gottlieb 2004), in fall of 2013. He scored at a level 3 (Developing) in the areas of Speaking, Listening, and Reading and scored at a level 2 (Emerging) in the area of Writing. Benito's general education and specialized instruction did not include direct vocabulary instruction.

Brando was also an 11-year-old fifth grade Latino male born in the United States who was identified as having a specific learning disability in reading and writing. Brando participated in the state's alternate assessment based on modified achievement standards for reading, and received small group separate room and extra testing time as testing accommodations. Brando attended general education classes for the majority of the school day and received consultative support from an ESL teacher that included monthly check-ins and annual language assessments. He received specialized instruction in a resource classroom for one hour per day, 5 days per week to work on his IEP goals that included reading fluency, comprehension, and written language skills. Brando's DRA™2 (Beaver & Carter, 2009) score indicated an overall reading proficiency level expected at the end of third grade prior to beginning intervention. Brando completed the state approved English language proficiency test, WIDA™ (Gottlieb 2004), in fall of 2013. He scored at a level 3 (Developing) in the areas of Speaking, Listening, and Reading and scored at a level 2 (Emerging) in the area of Writing. Brando's general education and specialized instruction did not include direct vocabulary instruction.

Christian was a 10-year-old Latino male in the fourth grade who was born in the United States and identified as having a specific learning disability in reading and writing. Christian participated in the state's alternate assessment based on modified

achievement standards for reading, and received small group separate room and extra testing time as testing accommodations. Christian attended general education classes for the majority of the school day and received consultative support from an ESL teacher that included monthly check-ins and annual language assessments. He received specialized instruction in a resource classroom for one hour per day, 5 days per week to work on his IEP goals in the areas of reading fluency, comprehension, and written language skills. Christian's DRA™2 (Beaver & Carter, 2009) score indicated an overall reading proficiency level expected mid-year of second grade prior to beginning intervention. Christian completed the state approved English language proficiency test, WIDA™ (Gottlieb 2004), in fall of 2013. He scored at a level 3 (Developing) in the areas of Speaking and Listening, and scored at a level 2 (Emerging) in the areas of Reading and Writing. Christian's general education and specialized instruction did not include direct vocabulary instruction.

Cortez was a 10-year-old fourth grade Latino male born in the United States with a specific learning disability in reading and writing. Cortez participated in the state's alternate assessment based on modified achievement standards for reading, and received small group separate room and extra testing time as testing accommodations. Cortez attended general education classes for the majority of the school day and received consultative support from an ESL teacher that included monthly check-ins and annual language assessments. He received specialized instruction in a resource classroom for one hour per day, 5 days per week to work on his IEP goals in the areas of reading fluency, comprehension, and written language skills. Cortez's DRA™2 (Beaver & Carter, 2009) score indicated an overall reading proficiency level expected at the end of second grade

prior to beginning intervention. Cortez completed the state approved English language proficiency test, WIDA™ (Gottlieb 2004), in fall of 2013. He scored at a level 3 (Developing) in the areas of Speaking and Listening, and scored at a level 2 (Emerging) in the areas of Reading and Writing. Cortez's general education and specialized instruction did not include direct vocabulary instruction.

TABLE 1: Participant demographics and present level of performance

Students	Age/ Grade	Disability	Retained Y/ N	Services/ Location	ESL Services	WIDA Reading Level	DRA Grade Level
			Demographic and Educational Services			Language and Reading Proficiency	
Andres	11 yr /5th	LD-R	Y	60-min Resource	Consult.	Level 3: Developing	End 3rd
Amelio	11 yr /5th	LD-RW	Y	60-min Resource	Consult.	Level 3: Developing	End 3rd
Benito	11 yr /5th	LD-RW	Y	60-min Resource	Consult.	Level 3: Developing	End 3rd
Brando	11 yr /5th	LD-RW	Y	60-min Resource	Consult.	Level 3: Developing	End 3rd
Christian	10 yr /4th	LD-RW	Y	60-min Resource	Consult.	Level 2: Emerging	Mid 2nd
Cortez	10 yr	LD-RW	Y	60-min	Consult.	Level 2:	Mid 2nd

| | /4th | Resource | Emerging |

Note. *LD* = learning disability; *R* = reading; *W* = writing; *ESL* = English as a Second Language; *WIDA* = World-Class Instructional Design and Assessment Consortium, *Level 1* = speaks no English, *Level 2* = beginning stages of conversational English, *Level 3* = bordeline proficient conversational English and beginning academic English language skills, *Level 4* = proficient conversational English skills borderline academic English language skills, *Level 5* = proficient conversational and academic English language skills; *DRA* = Diagnostic Reading Ability.

Materials

Academic vocabulary. The words taught in this study were sophisticated synonyms of known concept words (see pretesting section for assessment procedure) selected from the Academic Word List (AWL), which was developed by Coxhead (2000). The AWL is a list that is highly regarded among researchers and testing developers and is often used to measure academic vocabulary (see Baumann, Blanchowicz, Manyak, Graves & Olejnik, 2009; Baumann et al., 2013; Beck et al., 2013; Lesaux et al., 2010). The AWL contains 570 word families that are not in the most frequent 2,000 words of English but are found over a very wide range of academic texts. These words are grouped into 10 subsets sorted by frequency. Specifically, words categorized in subset 1 are most frequently read and are more essential for comprehension of academic text than words found in subset 2. For example, the word *analyze* is found in subset 1, whereas the word *adjacent* is found in subset 10. Therefore, the word *analyze* is considered to be of greater value for understanding academic texts as

opposed to the latter subset word, *adjacent*. To maximize the participants' learning of the academic words, word selection began with subset 1.

Lessons in Microsoft PowerPoint® slides. Each lesson was created by the experimenter and be delivered using the Microsoft PowerPoint® presentation format. Each lesson included scripts with audio and visual prompts for peer tutors to follow for lesson delivery. Each PowerPoint® lesson followed the same format structure, including: (a) using Calibri font (with a 36- to 60-pt font size of the text) in black color on white plain background; (b) being in 38-40 slides in length; (c) voice embedded audio symbols, (d) using simple clip art pictorial symbols (e.g., smiley) to serve as visual reinforcement and photographs aligning to the taught vocabulary (see Appendix E).

Graphic organizer. Participants used a graphic organizer to highlight prerecorded affixes, student-friendly definitions, target words, and Spanish cognates. Students drew a quick-sketch (i.e., personalized drawing), and wrote self-generated sentences/phrases to include the target word (e.g., *submerge* my head in the bath) that matched the quick sketch. The graphic organizer consisted of four equivalent boxes arranged vertically on an A4 size (8 ½ x 11 inches) paper and printed in portrait orientation. Participants were given folders to keep graphics together; the experimenter recommended participants to keep graphic organizers together and to review on occasion during the peer tutoring training session (see Appendix F).

Cloze passages. There were two types of experimenter-created, grade-level cloze passages (i.e., CR and non-CR passages) that was used to measure generalization of taught vocabulary (see dependent variable section for further description). Each passage consisted of 5-7 sentences in a connected text format (i.e., paragraph form) with five fill-

in-the-blank lines addressing the taught academic vocabulary words. Each passage was created on 8 ½ x 11 inch paper, double-spaced with 12 pt. Times New Roman font and printed in portrait orientation. A word bank was available for participants to choose one of the seven response options (i.e., five target words and two distractor words; see Appendix A for sample CR and non-CR passages).

Experimenter and Data Collector

The experimenter for the study was a doctoral candidate in special education with a Master of Education degree in special education. The experimenter taught for 7 years as an elementary school special education teacher working with culturally and linguistically diverse students with disabilities in urban settings, and worked as a special education program specialist for 3 additional years. She has a K-12 Special Education, Curriculum and Instruction, and Education Administration license. The experimenter has served as the primary investigator in two previous studies involving the implementation of a peer-delivered, computer-assisted intervention with Latino elementary-aged students. To avoid lessen observer bias, the assistant principal of the participating elementary school who speaks fluent Spanish and was a special education teacher of 10 years served as the primary data collector as often as possible. Prior to data collection, the experimenter trained administrator by modeling the use of data collection procedures and provided practice opportunities with feedback until the assistant principal demonstrated proper data collection independently.

Dependent Variables and Data Collection Procedures

There were two dependent variables, including (a) acquired academic vocabulary knowledge and (b) acquired vocabulary generalization using culturally relevant (CR) and non-CR passages. The academic vocabulary used in this study was derived from Coxhead (2000) and Beck et al. (2002). Academic vocabulary was defined by Beck et al. as frequently used academic words consistently found across many contexts and topics in grade level text; these words are identified as high-stakes vocabulary words that are frequently used on state-level assessments and are necessary for comprehension of sophisticated text. Examples of academic vocabulary included: relate (e.g., unrelated, related, relates, relating); resource (resources, resourcefulness, resourceful); and recognize (e.g., recognized, recognizing, recognizes, recognizable, recognition).

Academic vocabulary knowledge. Academic vocabulary knowledge was the primary dependent variable, defined as the number of correct responses measured on a 10-item vocabulary test assessing the academic vocabulary words being taught during the day's instructional session. The experimenter developed the test items using the Microsoft PowerPoint® program; each test required participants to form a relationship between an underlined word or phrase in a sentence and one of the four answer choices presented in a multiple-choice format. An example sentence is, *If Jose carries his laptop to his bedroom; I know the laptop is: (A) deflected, (B) portable, (C) deflated, (D) predictable.* In addition to the sentence and answer choices, the PowerPoint® slide also displayed a picture of a person carrying a laptop. The pictures provided additional opportunities for students to infer meaning of the probes provided. Each test item was read aloud by the experimenter and participants could ask for a test item to be repeated by raising his or her hand. Participants had 30 s to select and write their response for each

item on a standard-sized (8½ x 11 inches) paper numbered vertically 1-10 as a permanent product. Answers were marked as either correct or incorrect. A correct answer had to be legible, either as a written word or the corresponding letter that matched the answer key.

Academic vocabulary generalization. Academic vocabulary generalization was defined as the number of correct responses measured using two grade-level cloze passages (i.e., CR and non-CR passages). The purpose of the generalization measure was twofold. The first purpose was to determine the participants' ability to generalize learned vocabulary in isolation to grade-level connected passages. The second purpose was to determine if there was a difference between the numbers of correct responses on CR passages compared to the responses on the non-CR passages. Each passage consisted of 5-7 sentences with five fill-in-the-blank responses addressing the taught academic vocabulary words. There was a word bank of seven response options (i.e., five target words and two distractor words) from which the participants would select to complete the cloze assessment for each CR and non-CR passage. For each CR and non-CR passage compared during one data collection section, both passages consisted of identical target vocabulary words, equal sentence length, and shared genre of literature (e.g., autobiography, historical fiction, legend). All passages were read aloud to the participants. Data for academic vocabulary generalization were collected using an event recording method, counting the number of correct responses (i.e., five possible correct responses with a response for each sentence in the passage). All passages were grade-level passages that aligned to the Common Core State Standards for English Language Arts (CCSS- ELA, 2010) as measured by a lexile calculation using ATOS Readability™ (Malone, 2012). ATOS Readability is a Common Core State Standards for English

Language Arts (CCSS-ELA, 2010) approved online formula that estimates the difficulty of books and allows for text adaptations to meet specific grade-readability levels.

Generalization passages were written according to ATOS readability level between a fourth- and sixth-grade level and were derived using novel sentences that were not used during instructional sessions. Therefore, both passages were considered novel reads. For the purposes of this study, the term culture is defined by Sugai, O'Keefe, and Fallon (2012) as, "the extent to which a group of individuals engage in overt and verbal behavior reflecting shared behavioral learning histories, serving to differentiate the group from other groups, and predicting how individuals within the group act in specific setting conditions." (p. 14). With this framework, CR passages primarily considered the Latino participants' race, ethnicity, age, oral language, and geographical location as variables that were unique to each participant. Specific themes were related to participants' behavioral learning histories from specific settings (e.g., family routines, weekend activities, stories, and movies). This information was gathered from the student survey responses of each participant (see Appendix B for student survey). Additionally, Spanish cognates of affixes, roots, and base words were provided in answer choices when the words in both languages look and sound similar while sharing similar meaning. To elucidate, the words *relationado* and *relationship* are cognates because they share similar topography and share similar meaning; therefore, in this example *relationado* would be paired with *relationship* as an answer choice. However, the word *bizarre* is often confused with the Spanish word *bizarro* which actually translates to *gallant* in English. In this example, the word *bizzarro* would not be paired with *bizarre* as an answer choice because they do not share similar meanings. Non-CR passages was selected based on

teacher recommendations of grade-level reading topics that were not taught during this study, and the selected texts did not specifically consider the participant's race, ethnicity, age, oral language, or geographic location variables.

Each passage was developed based on the information collected about the participants in the study. Both passages (CR and non-CR) assessed during the same session shared the same theme. For example, one of the themes, *Events*, were written to historical or worldly knowledge. The CR passage was written on the up and coming World Cup Soccer games whereas the non-CR passage was written about Lewis and Clark's travels around the world. All CR passages were topically tailored to consider commonalities among the participants with specific cultural contextual variables of ethnicity, economic status, age, disability, language, and geographic location. See Table 2 for themes, readability, and length of the CR and non-CR passages across the baseline, intervention, and maintenance conditions.

CR and non-CR generalization was measured every fourth data point recorded on the primary dependent variable. CR and non-CR passages were presented in a counterbalanced format during each probe to control for sequence effect. For example, during a session, a participant might complete the CR passage first then non-CR passage, and completed the non-CR passage first during the next session.

TABLE 2: Themes, readability, and length of a CR and non-CR passage

Condition	Theme	Non-CR Passage		CR Passage		
		ATOS	Length	ATOS	Length	CR Aspects
Baseline						
Session 1	Language	6.75	5.2	6.75	5.2	A, Geo, E, L
Session 2	Entertainment	7.25	6.1	7.25	6.1	A, Gen, Geo
Session 3	Event	6.01	4.9	6.01	4.9	Geo, E, L
Intervention						
Session 4	Recreation	7.12	5.1	7.12	5.1	A, Gen, Geo, E
Session 5	Education	6.65	5.0	6.65	5.0	A, Gen, Geo
Session 6	Markets	7.25	5.75	7.25	5.75	Geo, E, L, ES
Session 7	Education	6.90	4.95	6.90	4.95	A, Gen, Geo, E, L, D
Session 8	Religion	7.12	5.12	7.12	5.12	Geo, E, L
Maintenance						
Session 9	Culture	6.65	5.01	6.65	5.01	Geo, E, L
Session 10	Event	7.12	5.11	7.12	5.11	A, Gen, E
Session 11	Education	7.01	5.0	7.01	5.0	A, Gen, Geo, E, L, D

Note. *ATOS* = CCSS-approved readability formula represents the difficulty of the text.
For example, an ATOS book level of 6.5 means that the text could likely be read by a
student whose reading skills are at the level of a typical sixth grader during the fifth
month of school; *Length* = average word length in each passage; A = age, Gen = Gender,
Geo = geography, E = ethnicity, L = language, D = disability; ES = economic status.

Interobserver Agreement

Interobserver agreement (IOA) measure was collected by the experimenter for a minimum of 30% of all data collection sessions across participants and experimental conditions. The experimenter used the same event recording method and independently recorded the correct responses and incorrect responses of the dependent variable measures using an answer key. IOA was calculated using an item-by-item method by dividing the number of agreed responses by total number of agreed plus disagreed responses, then multiplying by 100.

Experimental Design

A multiple probe across participants (three dyads) design (Horner & Baer, 1978) was used to determine whether a functional relation exists between the intervention (i.e., culturally relevant peer-delivered, computer-assisted vocabulary instruction) and acquired vocabulary knowledge and generalization. This design permitted the experimenter to administer the intervention to dyads at staggered times to establish experimental control. The design procedures were guided by Kratochwill and colleagues (2013), the What Works Clearinghouse (WWC), single-case standards, and included three phases of (a) baseline, (b) intervention, and (c) maintenance. There were at least five data points on the primary dependent variable (i.e., acquired vocabulary knowledge) for each baseline and intervention phase. Generalization probes were also collected across the three phases with data collection that occurred a minimum of every eighth session to adhere to WWC guidelines (Kratochwill et al., 2010). Decisions to change conditions were based on data pattern for the primary dependent variable only. At least three consecutive baseline data points were collected immediately before a dyad entered the intervention phase to ensure stability in data pattern. The first dyad entered intervention based on the participants who

showed the lowest and most stable baseline. At least three intervention data were collected with an increasing trend or a higher response level before the next dyad entered the intervention phase. Further, at least one data point was gathered for all participants prior to a new dyad entering the intervention to adhere to WWC guidelines (Kratochwill et al., 2010). Data analyses included visual analysis of data paths often used in single-case research design studies to determine level, trend, variability, overlap, and immediacy of effects.

Additionally, a simultaneous treatments design (Tawney & Gast, 1984) was used to analyze the comparative effects of CR passages and non-CR passages on students' acquired vocabulary generalization. The introduction of CR passage and non-CR passage was counterbalanced for a minimum of five sessions during the intervention phase. Data analysis for determining whether the participants were able to generalize acquired vocabulary better on one type of passage versus the other was evident if a clear separation exists between the two data paths. In addition, slope was calculated to provide additional analysis of the generalization data by dividing the vertical change (y2-y1) by the horizontal change (x2-x1) on a connected line during a phase for each type of passages.

Procedures

Pretesting. Two pretests were administered across a total of four sessions prior to baseline. The first pretest, administered across two 15-min sessions, consisted of 60 academic vocabulary words that was selected from a collection of the most frequently found academic vocabulary from *Sublist 1* derived from Coxhead (2000). All participants completed the pretests simultaneously in a group setting. The experimenter read aloud

words upon student request. Participants were directed to circle any known vocabulary words. At the end of a pretest session, students were asked in a one-on-one setting by the experimenter to define or use the circled "known" word in a sentence. For example, "What does *analyze* mean?" Participants had 5 s to respond in English. If the student incorrectly responded or did not respond, the student was asked to use the word in a sentence. Vocabulary accurately defined or correctly used in a sentence by participants was excluded from the study.

The second pretest, administered across two 15-min sessions, consisted of 60 less sophisticated words or phrases that are synonymous to the academic vocabulary measured on the first pretest. The first pretest consisted only of words identified as sophisticated vocabulary. For example, the word *visibility* was on pretest 1 and was identified as a sophisticated vocabulary word. The second pretest consisted of words or phrases that were easier to understand but shared the same meaning as the words found on pretest 1. As an example, pretest 2 had the phrase *to see clearly* that was the less complicated meaning of *visibility*. There was a two-step process to determine vocabulary used during the intervention. First, the pretest 1 words had to be determined as "unknown" or "incorrectly defined" by all participants in the study. Second, the pretest 2 words that shared the same meaning as words not known on pretest 1 had to be "known" on pretest 2 and determined as "correctly defined" by all participants in the study. Any words either known or unknown on both pretests were excluded and not used for instruction.

Baseline. During the baseline condition, participants received typical classroom instruction. Classroom reading instruction consisted of a 45-min block using a Reader's

Workshop® model (Calkins, 2001), prescribed by the school district, for all students in grades K-5. Reader's Workshop® is a reading program by Lucy Calkins (2001) that emphasizes student-led self-selection of literature, self-pacing, and student-led discussion groups. Procedures in the Reader's Workshop® include: (a) *sharing literature*, during which teachers read a book aloud to promote discussion; (b) *mini lessons*, which are brief (e.g., 10 min) teacher-conducted lessons that focus on a particular reading strategy; (c) *activity time*, which consists of partner or individualized reading; teachers typically work with small groups or individual students during this part of the lesson while the remaining students are expected to read to themselves or with a partner; and (d) *sharing*, during which students share with their class personal books and activities they have been working on with their partners. Reader's Workshop® does not include explicit vocabulary instruction or culturally relevant instruction. Each participant's pretreatment performance of vocabulary knowledge and generalization was established through the administration of baseline probes. Peer-delivered, computer-assisted, or culturally relevant instruction did not take place during this phase.

Peer tutor and tutee training. The experimenter trained all participants on the steps of reciprocal peer tutoring during two 20-min training sessions, immediately prior to implementing the intervention. First, the experimenter (a) welcomed and explained the purpose and roles of the tutor and tutee; (b) explained and defined the three tutor rules (i.e., be a good role model, listen carefully, and speak clearly); (c) reviewed each slide to explain how to activate PowerPoint® slides show and transition through the lesson; (d) showed the tutors how to click the computer mouse or tap the space bar on the keyboard to proceed to the next slide, "respond" to the prompt which was a solid red line that

follows a directive or a question, and click the options to move on to praise versus an error correction slide. In addition, the experimenter taught the expected tutor behaviors (i.e., read all words on each slide, wait for tutee's response before clicking on the mouse or tapping the space bar, and ensure tutee's participation when expected). The experimenter modeled tutor and tutee behaviors by providing three examples of the tutee providing a correct response which then elicited verbal praise (e.g., "awesome job!" or "you're right!"), three examples of the tutee providing an incorrect response which prompted the tutor to say "try again" and for the tutor to repeat the steps until a correct response was elicited, and lastly three examples the tutee providing no response which then elicited a redirect prompt by the tutor (e.g., " [name of tutee], stay with me") following by the tutor repeating the question or directive. The experimenter modeled the tutor behaviors and allowed the participants to practice teaching a lesson with the experimenter's feedback. Evidence of mastery of tutoring behaviors included demonstrating correct tutor and tutee roles and restating the rules during practice. Training continued until each student could present the content and respond correctly for three consecutive slides.

Culturally relevant, peer-delivered vocabulary instruction. The experimenter developed the vocabulary curriculum to target fifth grade academic vocabulary words identified by Beck et al. (2002) and Coxhead's (2000) academic words. There were approximately 12 lessons across a maximum of 6 instructional units; each unit consisted of 20 words with 10 words taught each instructional session. Each unit was constructed around a particular morphemic theme (e.g., "The *Not* Family"). During each lesson, the

tutor used the Microsoft PowerPoint® presentation format to deliver the instruction by following a script on each slide.

Each lesson followed the same instructional format using explicit instruction (i.e., model-test procedure), and the use of a graphic organizer. The sequence of each lesson was as follows.

1. Introduced the lesson (e.g., *Tutor says*: "We are going to use words we know to learn new words").

2. Activated audio of an example sentence using the new word (e.g., *Audio says*: "The boy wanted to persuade his mom to buy him ice cream.")

3. Pronounced the word (e.g., *Audio says*: "Per…suade; Persuade")

4. Both tutee and tutor said the word (e.g., *Tutor says*: "Let's say persuade"… "one more time…")

5. Provided a student-friendly definition (e.g., *Tutor says*: "Persuade means to try to make someone do or believe something.")

6. Prompted tutee to respond to questions (e.g., *Tutor says*: What means to make someone do or believe an idea? [then] *Tutor says*: What does persuade mean?")

7. Provided feedback (e.g., *Tutor says*: "Yes! Persuade means to make someone do or believe an idea)

8. Provided examples (e.g., *Tutor says*: "giving good reasons is a way to persuade someone to believe or do something").

9. Highlighted the word on the graphic organizer (e.g., persuade).

10. Introduced Spanish cognate if available (e.g., *Tutor says*: "The Spanish word for persuade is persuadir.")

11. Underlined the parts that are the same in Spanish and English on the graphic organizer (e.g., persuadir [and] persuade).

12. Provided three examples and nonexamples for guided practice (e.g., *Tutor says*: "A man telling someone to buy his bike because it has good tires. Is the man trying to persuade or not persuade?")

13. Activated error correction procedure for three examples (tutor clicks option for tutee's response [e.g., persuade or not persuade]) or provide positive feedback.

14. Drew a quick sketch of an example on the graphic organizer (tutor and tutee)

15. Introduced affixes or other word (e.g., *Tutor says*: "Now we are going to learn another word that means "not" or "opposite").

16. Provided definition of the affix and used it with newly taught word (e.g., *Tutor says*: "dis means *not*; so, *dis*suade means trying not to make someone do or believe something.")

17. Prompted tutee to respond to questions (e.g., *Tutor says*: What means trying not to make someone do or believe something? [then] *Tutor says*: What does dissuade mean?")

18. Provided feedback (e.g., *Tutor says*: "Yes! Dissuade means trying not to make someone do or believe something.")

19. Provided two examples and nonexamples for guided practice (e.g., *Tutor says*: Should we persuade or dissuade someone to: "Touch a fire")

20. Activated error correction procedure (tutor clicked option for tutee's response [e.g., persuade or dissuade]) or provided positive feedback.

21. Provided feedback (e.g., *Tutor says*: "Dissuade; we would dissuade someone from touching a fire." or "Touching a fire will burn your hand; we would dissuade someone from touching a fire. Let's try again") for two examples.

22. Reviewed target words and provided feedback (e.g., *Experimenter says*: "Great job working so hard today; try to use these new words - you'll really impress your teachers!")

After the completion of each lesson, the experimenter reviewed the graphic organizer for a product check for the participants to collect and keep these documents in a personalized folder; the experimenter then provided general positive feedback to both the tutor and tutee (e.g., "You were very engaged in the lesson; great job."). To move to the next unit, at least one participant (i.e., tutor or tutee) must obtain a score of 80% (i.e., 8 of 10 correct responses) on one of the two unit probes and the other participant must show an ascending trend in the intervention phase.

Maintenance. Maintenance data were collected in the same format as the primary dependent variable during baseline and the intervention condition. Ten words that were taught during the intervention condition were randomly selected for maintenance measure to determine the degree to which the participants continued to demonstrate their vocabulary knowledge. After the last intervention session, maintenance data were

collected after the 2-week, 3- week, 4-week, 6-week, and 8-week mark. Students participated in traditional classroom instruction of Readers' Workshop as described during the baseline condition.

Content Validity

To ensure content validity of the vocabulary lessons, one reading expert and one EL expert reviewed all PowerPoint® lessons. The reading expert who ensured all vocabulary was grade appropriate was a highly-qualified curriculum coordinator with an M.Ed.in Elementary Education with additional licensure in Language Arts and Administration. The English as a Second Language (ESL) teacher was also highly qualified under the state's teacher credential standards, but she spoke English only. The experts rated each item using a 24-item content validity checklist with a YES or NO (see Appendix C). The checklist consisted of items related to the appropriateness of targeted grade-level vocabulary, the extent to which cultural and linguistic sensitivity was integrated in the lesson, and the appropriateness of support provided to participating ELs in learning vocabulary.

Procedural Reliability

Procedural reliability data were collected by a second observer for a minimum of 30% of the instructional sessions across the three dyads by observing the peer tutors and recording if each tutor completed all procedural steps correctly by following the lesson scripts: (a) introduced target word in English and Spanish cognate, if appropriate; (b) described student-friendly definition; (c) activated audio; (d) asked questions related to specific target vocabulary word; (e) presented all examples and nonexamples included in the PowerPoint® slides; (f) activated student responding activity; (g) provided response

feedback; (h) reviewed target word and definition; (i) provided overall lesson feedback to tutee; and (i) showed appropriate tutor behaviors. The observer rated the extent to which the peer tutor completed each step by marking a (+) for each step performed correctly and a (-) for each step not performed or performed incorrectly using a 22-step procedural reliability checklist (see Appendix E). The mean rating of the procedural reliability was calculated by dividing the number of correctly performed steps by the total number of procedural steps (i.e., 22), then multiplying by 100.

Social Validity

Consumer satisfaction questionnaires were given to the participants, their parents, and their teachers to assess consumer satisfaction of the intervention. The teacher questionnaire consisted of seven items on a 5-point Likert scale, ranging from strongly disagree (1) to strongly agree (5). Teachers rated their perceptions on the importance of the targeted vocabulary for Latino ELs with LD, the appropriateness and feasibility of the peer-delivered, computer-assisted vocabulary instruction in the classroom, the importance of culturally relevant instruction, and the academic and social significance of the vocabulary knowledge change. The participant questionnaire consisted of nine items on a 5-point Likert scale, ranging from strongly disagree (1) to strongly agree (5). The participants rated the degree to which they liked the instruction, liked working with peers, preferred CR passages or non-CR passages, and the extent to which they felt their vocabulary knowledge has improved. The family questionnaire consisted of nine items on a 5-point Likert scale, ranging from strongly disagree (1) to strongly agree (5). The parents rated the degree to which they liked the culturally relevant components of the

instruction and the extent to which they felt their child's vocabulary knowledge had

improved.

CHAPTER 4: RESULTS

In this chapter, results for interobserver agreement and procedural reliability measures are presented. Also, this chapter will report data and show graphs that depict the results of each participant's performance on the dependent variables (i.e., academic vocabulary knowledge and generalization of vocabulary knowledge using grade level passages). Finally, this chapter will include data that will help to answer each of the research questions.

Interobserver Agreement

The experimenter collected the interobserver agreement (IOA) data for all dependent variables across all experimental conditions. The experimenter used the same event recording method as the one used by the primary data collector and independently recorded the correct responses and incorrect responses of the dependent variable measures using an answer key. IOA was calculated using an item-by-item method by dividing the number of agreed responses (by both observers) by total number of agreed plus disagreed responses, then multiplying by 100. IOA data for the academic vocabulary knowledge (primary dependent variable) were collected for 40% of the baseline, intervention, and maintenance sessions and yielded a 100% agreement across all sessions. IOA data for the academic vocabulary generalization (secondary dependent variable) were collected for 33% of the generalization sessions and was 100% across all sessions.

Procedural Reliability

The assistant principal also collected the procedural reliability data by observing the peer tutors and recording if each tutor completed the 10 procedural steps correctly by following the lesson scripts to (a) introduce target word in English and Spanish cognate (if appropriate), (b) describe student-friendly definition, (c) activate audio, (d) asked questions related to specific target vocabulary word, (e) presented all examples and nonexamples, (f) activate student responding activity, (g) provide response feedback, (h) reviewed target word and definition, (i) provide overall lesson feedback to tutee, and (j) showed appropriate tutor behaviors. The observer rated the extent to which the peer tutor completed each step by marking a (+) for each step performed correctly and a (-) for each step not performed or performed incorrectly using a procedural reliability checklist. The mean rating of the procedural reliability was calculated by dividing the number of correct responses by the total number of correct plus incorrect responses, then multiplying by 100. Procedural fidelity data were collected across 32% of the baseline and treatment sessions and 37% of generalization and maintenance sessions. The procedural fidelity was 100% for all sessions.

Content Validity Results

The reading expert and an ESL teacher reviewed all lessons for content validity using a 24-item content validity checklist. Results for content validity of the vocabulary lessons were 100% across all lessons for the appropriateness of targeted grade-level vocabulary and integration of cultural and linguistic sensitivity.

Academic Vocabulary Data

Participants were asked to respond to two types of assessments throughout all phases in the study (baseline, intervention, generalization, and maintenance). First, participants were asked to respond to a 10-item test (i.e., primary dependent variable) developed by the experimenter that required participants to form a relationship between an underlined word or phrase in a sentence and one of the four answer choices presented in a multiple-choice format. Second, participants were asked to respond to two passages consisted of five fill-in-the-blank sentences each passage when given a word bank of seven vocabulary words (five correct words and two distractors) that addressed taught vocabulary (i.e., secondary dependent variable). One passage was thematically created to be relevant to the lives of the participants (i.e., culturally relevant) and the other passage was created that did not specifically relate to the lives of the participants.

Academic vocabulary knowledge. The first dependent variable, academic vocabulary knowledge, was defined as the number of correct responses measured on a 10-item vocabulary test that assessed only the academic vocabulary words taught during that day's instructional session. During baseline prior to instruction, none of the participants answered more than one item correct on each 10-item assessment. All six participants increased their number of correct responses on academic vocabulary knowledge after receiving the culturally relevant, peer-delivered, computer-assisted vocabulary instruction. Analysis of mean and range of the data (Table 3) and graphic displays (Figures 1 and 2, closed data points) for all six participants indicated a change in level and an immediacy of effect across baseline and intervention phases.

Calculating the percentage of nonoverlapping data (PND) is one method for comparing data from two adjoining phases (e.g., baseline and intervention data). PND is calculated by (a) counting the number of data points in the second phase that are outside the range of data collected in the first phase, (b) dividing this number by the total number of data points in the second phase, and (c) multiplying the resulting number by 100 (Scruggs & Mastropieri, 1998).

Andres. During baseline, Andres answered one item correct on one measure across all five sessions ($M = .2$). As demonstrated in Figure 1, Andres' data in baseline show a low level stable trend. During intervention phase, Andres' correct responses on probes of academic vocabulary taught ranged from 8 to 10 ($M = 9.2$) indicating a data pattern that shows a linear, high level and stable trend. Data comparison from baseline to treatment represents a mean increase of 9.0 correct responses indicating an immediacy of an effect with 100% PND across baseline to treatment. Finally, Andres maintained an average of 6.6 correct responses on five maintenance probes across 8 weeks.

Amelio. During baseline, Amelio scored 0 ($M = .0$) across all baseline sessions. As demonstrated in Figure 2, Amelio's data in baseline show a zero level and a highly stable trend. During intervention, Amelio's correct responses on probes of academic vocabulary taught ranged from 8 to 10 ($M = 8.9$), indicating a data pattern that shows a high level and stable trend. Data comparison from baseline to treatment represents a mean increase of 8.9 correct responses indicating an immediacy of an effect with 100% PND across baseline to treatment. Finally, Amelio maintained an average of 6.4 correct responses on five maintenance probes across 8 weeks.

Benito. During baseline, Benito scored a range of 0 to 1 point (*M* = .6). As demonstrated in Figure 1, Benito's baseline data were low level, flat trend showing low variability. During intervention, Benito's correct responses on probes of academic vocabulary taught ranged from 6 to 10 (*M* = 9.1), indicating a data pattern that shows a high level and an overall increasing trend with stability across the last nine sessions. Data comparison from baseline to treatment represents a mean increase of 8.5 correct responses indicating an immediacy of an effect with 100% PND across baseline to treatment. Finally, Benito maintained an average of 6.6 correct responses on five maintenance probes across 8 weeks.

Brando. During baseline, Brando scored a range of 0 to 1 point (*M* = .3). As demonstrated in Figure 2, Brando's data were low level with a slight decreasing trend across the baseline data points. During intervention, Brando's correct responses on probes of academic vocabulary taught ranged from 7 to 10 (*M* = 8.8), indicating a data pattern that shows a high level and an overall increasing trend with some variability across the intervention sessions. Data comparison from baseline to treatment represents a mean increase of 8.5 correct responses indicating an immediacy of an effect with 100% PND across baseline to treatment. Finally, Brando maintained an average of 7.2 correct responses on five maintenance probes across 8 weeks.

Christian. During baseline, Christian scored a range of 0 to 2 points (*M* =.8), with an overall decreasing trend at a low level of responding. During the intervention condition, Christian's correct responses on probes of academic vocabulary taught ranged from 7 to 10 (*M* = 8.8), with some variability and an overall flat trend, but clear immediacy of an effect when compared to his baseline performance; there was a mean

increase of 8.0 correct responses. The PND for Christian's data across baseline and intervention was 100%. Christian maintained an average of 6.2 correct responses on five maintenance probes across 8 weeks.

Cortez. During baseline, Cortez scored a range of 0 to 1 point ($M = .5$). As demonstrated in Figure 1, Cortez's baseline data were at low level and stable with a flat linear trend. During intervention, Cortez's correct responses on probes of academic vocabulary taught ranged from 6 to 10 ($M = 8.5$), indicating a data pattern that shows a high level and an increasing trend with some variability. Data comparison from baseline to treatment represents a mean increase of 8.0 correct responses indicating an immediacy of an effect with 100% PND across baseline to treatment. Cortez maintained an average of 6.4 correct responses on five maintenance probes across 8 weeks.

TABLE 3: Mean and range of correct academic vocabulary responses

Students	Vocabulary Knowledge			Vocabulary Generalization		
	Baseline	Intervention	Maint.	Baseline	Intervention	Maint.
Dyad 1	M = .0	M = 9.2	M = 6.6	M = .0	M = 8.6	M = 9.0
Andres	R = 0-1	R = 8-10	R = 6-8	R = 0-0	R = 7-10	R =8-10
Dyad 1	M= .0	M= 8.9	M= 6.4	M= .0	M= 8	M= 7.7
Amelio	R = 0-0	R= 8-10	R= 6-7	R = 0-0	R= 7-10	R=6-8
Dyad 2	M= .6	M= 9.1	M= 6.6	M= .5	M= 8.8	M= 8.6
Benito	R= 0-1	R= 6-10	R= 5-9	R= 0-1	R= 8-10	R=8-10
Dyad 2	M= .3	M= 8.8	M= 7.2	M= .5	M= 7.6	M= 8
Brando	R= 0-1	R= 7-10	R= 5-10	R= 0-1	R= 6-9	R=7-10
Dyad 3	M= .8	M= 8.8	M= 6.2	M= 1	M= 7.8	M= 7.7
Christian	R= 0-2	R= 7-10	R= 5-7	R= 0-2	R= 7-10	R=7-8
Dyad 3	M= .5	M= 8.5	M= 6.4	M= .5	M= 7.6	M= 7.7
Cortez	R= 0-1	R= 6-10	R= 6-7	R= 0-1	R= 4-10	R=7-9

Note. M = mean; R = range

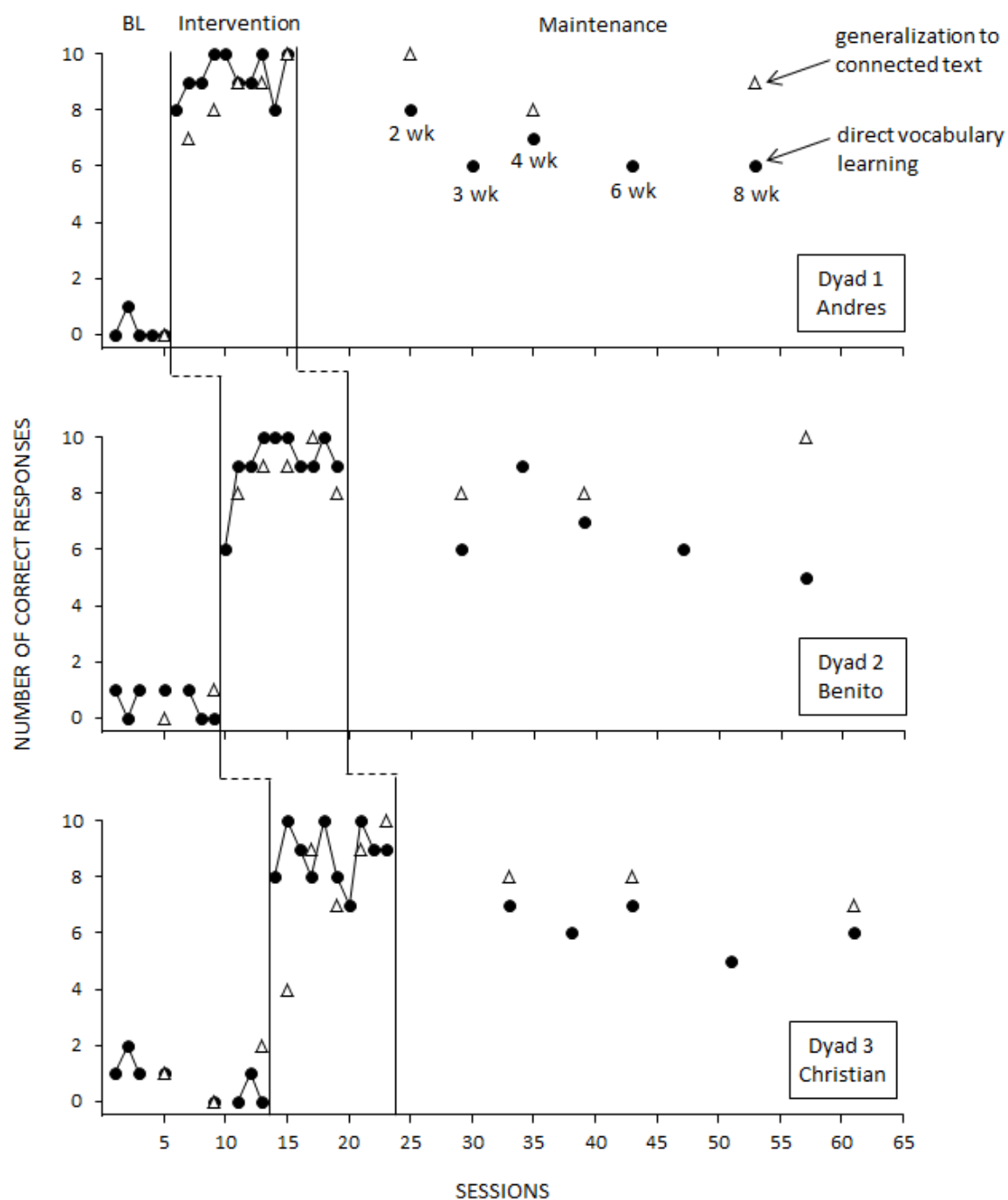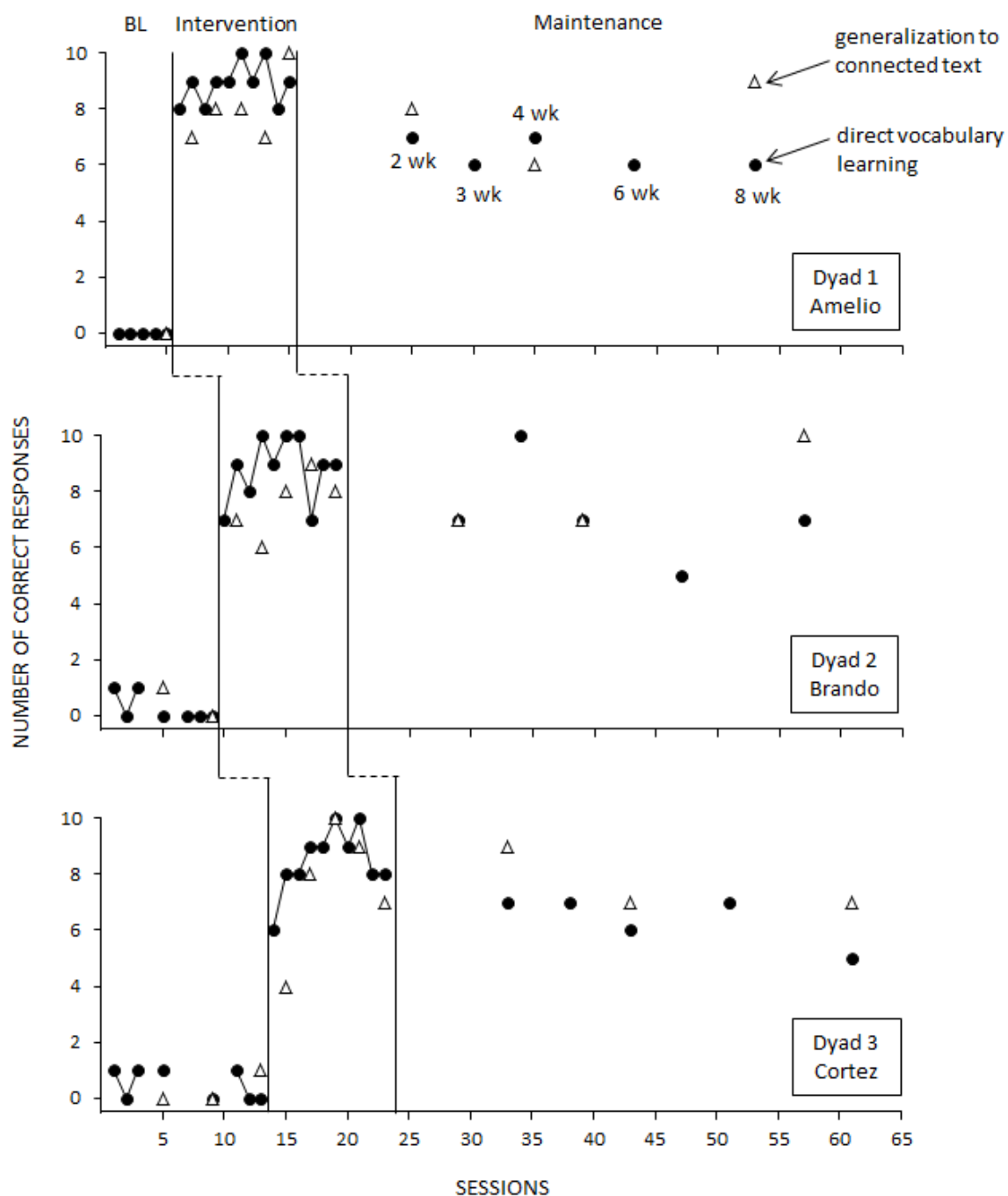FIGURE 1: Vocabulary knowledge and generalization data for initial tutors.

FIGURE 2: Vocabulary knowledge and generalization data for initial tutees.

Academic vocabulary generalization. Academic vocabulary generalization was

defined as the number of correct responses measured using two grade-level cloze

passages (i.e., culturally relevant and non-culturally relevant passages). The purpose of

the generalization measure was twofold. The first purpose was to determine the participants' ability to generalize learned vocabulary in isolation to grade-level connected passages that assessed the academic vocabulary words taught. Mean and range of the data presented in Table 3 (under the Vocabulary Generalization column) and graphic displays in Figures 1 and 2 (open data points) show the results of the combined number of correct responses on both passages (10 possible correct responses across both passages) assessed within one data collection session.

During baseline prior to instruction, none of the participants answered more than two items correct across both types of passages. All six participants increased their number of correct responses on academic vocabulary generalization after receiving the culturally relevant, peer-delivered, computer-assisted vocabulary instruction.

Andres. During baseline, Andres did not correctly respond to the generalization probe ($M = .0$). During intervention, Andres's correct responses on probes of academic vocabulary generalization ranged from 7 to 10 ($M = 8.8$) and showed a data pattern with an overall increasing trend. Data comparison from baseline to treatment represents a mean increase of 8.8 correct responses indicating an immediacy of an effect with 100% PND across baseline to treatment. Finally, Andres maintained an average of 9.0 correct responses on three maintenance probes across 8 weeks.

Amelio. During baseline, Amelio scored 0 ($M = .0$) on the generalization measure. During intervention, Amelio's correct responses on probes of academic vocabulary generalization ranged from 7 to 10 ($M = 8.0$) with an increased level and a flat trend followed by an immediate increase in level from 7 to 10 in the last generalization measure during the intervention condition. Data comparison from baseline to treatment

represents a mean increase of 8.0 correct responses indicating an immediacy of an effect with 100% PND across baseline to treatment. Finally, Amelio maintained an average of 8.0 correct responses on three maintenance probes across 8 weeks.

Benito. During baseline, Benito scored a range of 0 to 1 point ($M = .5$) on the two generalization data points. During intervention, Benito's correct responses on probes of academic vocabulary generalization ranged from 8 to 10 ($M = 8.8$) with an overall increasing trend. Data comparison from baseline to treatment represents a mean increase of 7.5 correct responses indicating an immediacy of an effect with 100% PND across baseline to treatment. Benito maintained an average of 8.7 correct responses on three maintenance probes across 8 weeks.

Brando. During baseline, Brando scored a range of 0 to 1 point ($M = .5$) across the two generalization data points. During intervention, Brando's correct responses on probes of academic vocabulary generalization ranged from 6 to 9 ($M = 7.6$) with an overall increasing trend. Data comparison from baseline to treatment represents a mean increase of 7.1 correct responses indicating an immediacy of an effect with 100% PND across baseline to treatment. Finally, Brando maintained an average of 8.0 correct responses on three maintenance probes across 8 weeks.

Christian. During baseline, Christian scored a range of 0 to 2 points ($M = 1.0$), with a slight increasing trend. During the intervention condition, Christian's correct responses on probes of academic vocabulary generalization ranged from 4 to 10 ($M = 7.8$) with a rapid increasing trend; there was a mean increase of 6.8 correct responses. The PND for Christian's data across baseline and intervention was 100%. Christian

maintained an average of 8.0 correct responses on three maintenance probes across 8 weeks.

Cortez. During baseline, Cortez scored a range of 0 to 1 point ($M = .5$) with a stable and flat trend. During intervention, Cortez's correct responses on probes of academic vocabulary generalization ranged from 4 to 10 ($M = 7.6$) with an overall increasing and high variability in data pattern. Data comparison from baseline to treatment represents a mean increase of 7.1 correct responses indicating an immediacy of an effect with 100% PND across baseline to treatment. Cortez maintained an average of 7.7 correct responses on three maintenance probes across 8 weeks.

Culturally relevant and non-culturally relevant passage generalization. Another purpose of this dissertation study was to determine the extent to which the participants responded differently when given culturally relevant (CR) passages versus non-culturally relevant (non-CR) passages. Figures 3 and 4 display the cumulative number of correct responses on generalization probes of taught vocabulary words given on grade level connected text for each participant separated by paths of culturally relevant passage and non-culturally relevant passage conditions. The cumulative number of correct responses by each participant on culturally relevant passages is indicated by an open triangle and the cumulative number of correct responses by each participant on non-culturally relevant passages is indicated by a closed circle. Results are described as the cumulative number of correct responses for each type of passage at the end of each condition and as the overall data path pattern.

Andres. As demonstrated in Figure 3, Andres' baseline data show that by the end of baseline, Andres correctly responded to a total of 0 vs. 0 passage probes on non-CR vs.

CR passages, respectively. Andres correctly responded to a total of 19 vs. 24 passage probes by the end of intervention, and 31 vs. 39 by the end of maintenance on non-CR vs. CR passages, respectively. Across treatment, and maintenance conditions, Andres more frequently responded correctly to probes on CR passages versus non-CR passages with a gap that widens as Andres progressed through the last maintenance data collection. In addition, calculation of slope for each data path was used to determine which type of passage showed higher rate of response accuracy during the intervention phase only. Andres' correct responses on the CR passages produced a steeper slope of .95 vs. .85 on the non-CR passages indicating that Andres more frequently responded correctly on the CR passages probes vs. the non-CR passages probes.

Amelio. As demonstrated in Figure 4, Amelio's baseline data show that by the end of baseline, Amelio correctly responded to a total of 0 vs. 0 passage probes on non-CR vs. CR passages, respectively. Amelio correctly responded to a total of 17 vs. 23 passage probes by the end of intervention, and 26 vs. 37 by the end of maintenance on non-CR vs. CR passages, respectively. Across treatment, and maintenance conditions, Amelio more frequently responded correctly to probes on CR passages versus non-CR passages; the gaps widened toward the end of the intervention condition and the end of the maintenance condition. Results of the slope calculation indicated Amelio's correct responses on the CR passages produced a steeper slope of .95 vs. .70 on the non-CR passages confirming Amelio's more frequently accurate responses on the CR passages probes vs. the non-CR passages probes.

Benito. As demonstrated in Figure 3, Benito's baseline data show that by the end of baseline, Benito correctly responded to a total of 0 vs. 1 passage probes on non-CR vs.

CR passages, respectively. Benito correctly responded to a total of 21 vs. 24 passage probes by the end of intervention, and 32 vs. 39 by the end of maintenance on non-CR vs. CR passages, respectively. Across baseline, treatment, and maintenance conditions, Benito more frequently responded correctly to probes on CR passages versus non-CR passages. Results of the slope calculation indicated Benito's correct responses on the CR passages produced a steeper slope of .95 vs. .85 on the non-CR passages confirming Benito's more frequently accurate responses on the CR passages probes vs. the non-CR passages probes.

Brando. As demonstrated in Figure 4, Brando's baseline data show that by the end of baseline, Brando correctly responded to a total of 1 vs. 0 passage probes on non-CR vs. CR passages, respectively. By the end of intervention, Brando correctly responded to a total of 17 vs. 21 passage probes and 28 vs. 35 by the end of maintenance on non-CR vs. CR passages, respectively. Brando more frequently responded correctly to probes on non-CR passages compared to NR passages during baseline; however, across treatment and maintenance conditions, Brando more frequently responded correctly to probes on CR passages versus non-CR passages. Results of the slope calculation showed that Brando's correct responses on the CR passages produced a steeper slope of .85 vs. .70 on the non-CR passages confirming Brando's more frequently accurate responses on the CR passages probes vs. the non-CR passages probes.

Christian. As demonstrated in Figure 3, Christian's baseline data show that by the end of baseline, Christian correctly responded to a total of 0 vs. 3 passage probes on non-CR vs. CR passages, respectively. Christian correctly responded to a total of 19 vs. 23 passage probes by the end of intervention, and 28 vs. 37 by the end of maintenance on

non-CR vs. CR passages, respectively. Across baseline, treatment, and maintenance conditions, Christian more frequently responded correctly to probes on CR passages versus non-CR passages, and the gap widens as Christian approached the last session of the maintenance data collection. Results of the slope calculation indicated Christian's correct responses on the CR passages produced a steeper slope of .90 vs. .85 on the non-CR passages, indicating that Christian more frequently made accurate responses on the CR passages probes compared to the non-CR passages probes.

Cortez. As demonstrated in Figure 4, Cortez's baseline data show that by the end of baseline, Cortez correctly responded to a total of 0 vs. 1 passage probes on non-CR vs. CR passages, respectively. Cortez correctly responded to a total of 18 vs. 21 passage probes by the end of intervention, and 28 vs. 34 by the end of maintenance on non-CR vs. CR passages, respectively. Across baseline and maintenance conditions, Cortez more frequently responded correctly to probes on CR passages versus non-CR passages. Results of the slope calculation indicated that there was no difference between the CR and non-CR passages and Cortez's correct responses rate. Both CR and non-CR passages produced a positive slope of .85; Cortez was able to correctly respond on both types of probes at about the same response rate.

In order to examine the consistency of both data paths, the six participants' data were collected and analyzed to reveal a cumulative response mean and range for both conditions during the intervention and maintenance phases. During baseline, collectively participants correctly responded with a cumulative mean of 1.5 (range = 0-3) on CR passages, compared to a mean score of .2 (range = 0-1) on the non-CR passages. During the intervention phase, participants correctly responded with a cumulative mean of 26.4

(range = 21-24) on CR passages, compared to a mean score of 22.0 (range 17-21) on non-CR passages. By the end of the maintenance condition, participants correctly responded with a cumulative mean of 35.2 (range = 34-39) on CR passages, compared to a mean score of 28.3 (range 26-31) on non-CR passages. Overall, when these numbers are used to calculate the percentage of taught vocabulary words that were generalized, there are considerable differences between the two conditions (88% accuracy on CR passages and 73% accuracy on non-CR passages). These data paths show that the cumulative number of correct responses on generalization of academic vocabulary were higher for all six students during the CR passage condition when compared to the non-CR passage condition. Visual analysis of the data indicated a clear separation between the two conditions during the intervention condition for all six participants, and the discrepancy broadened across the maintenance condition.
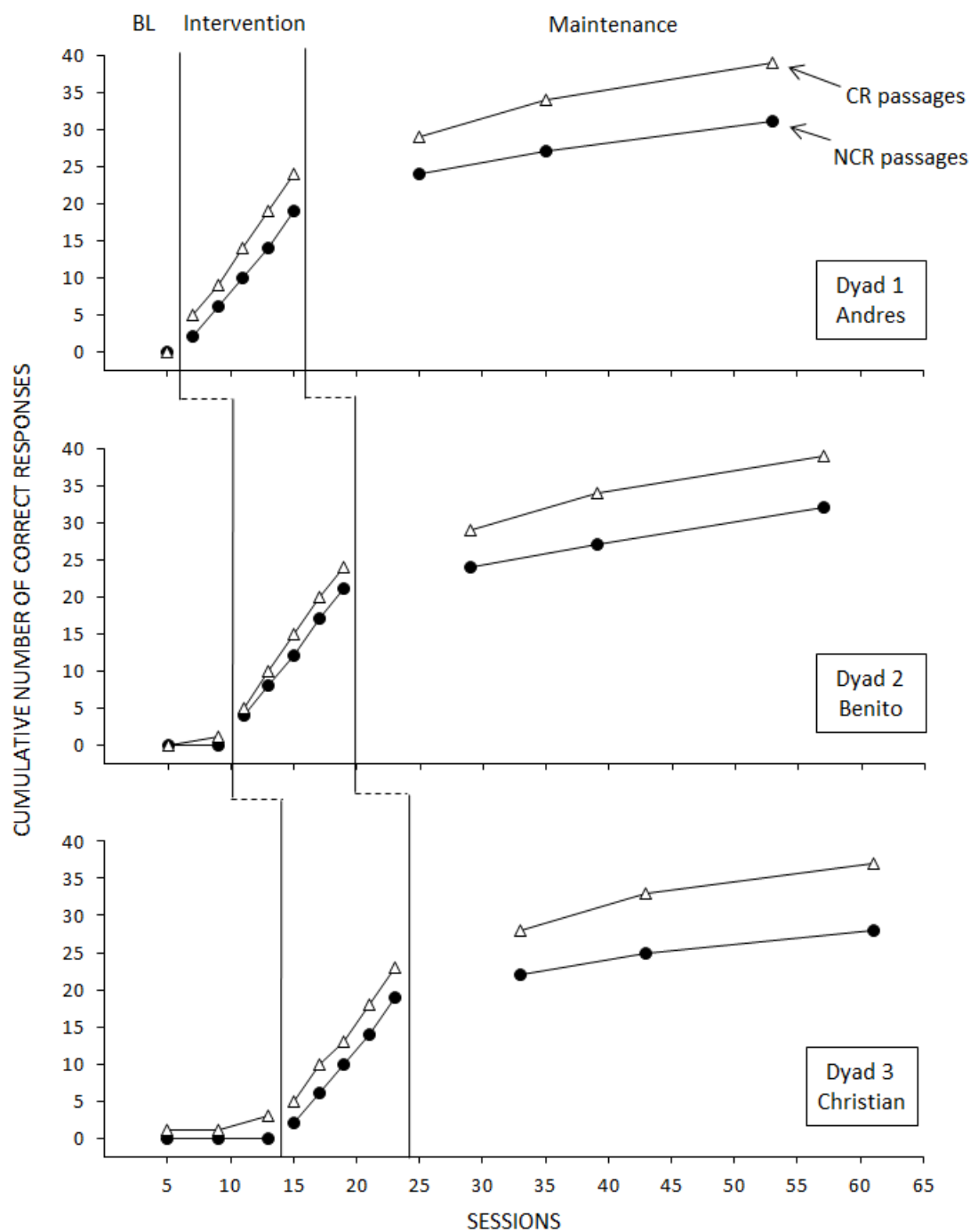
FIGURE 3: Correct responses on CR and non-CR passages for initial tutors.
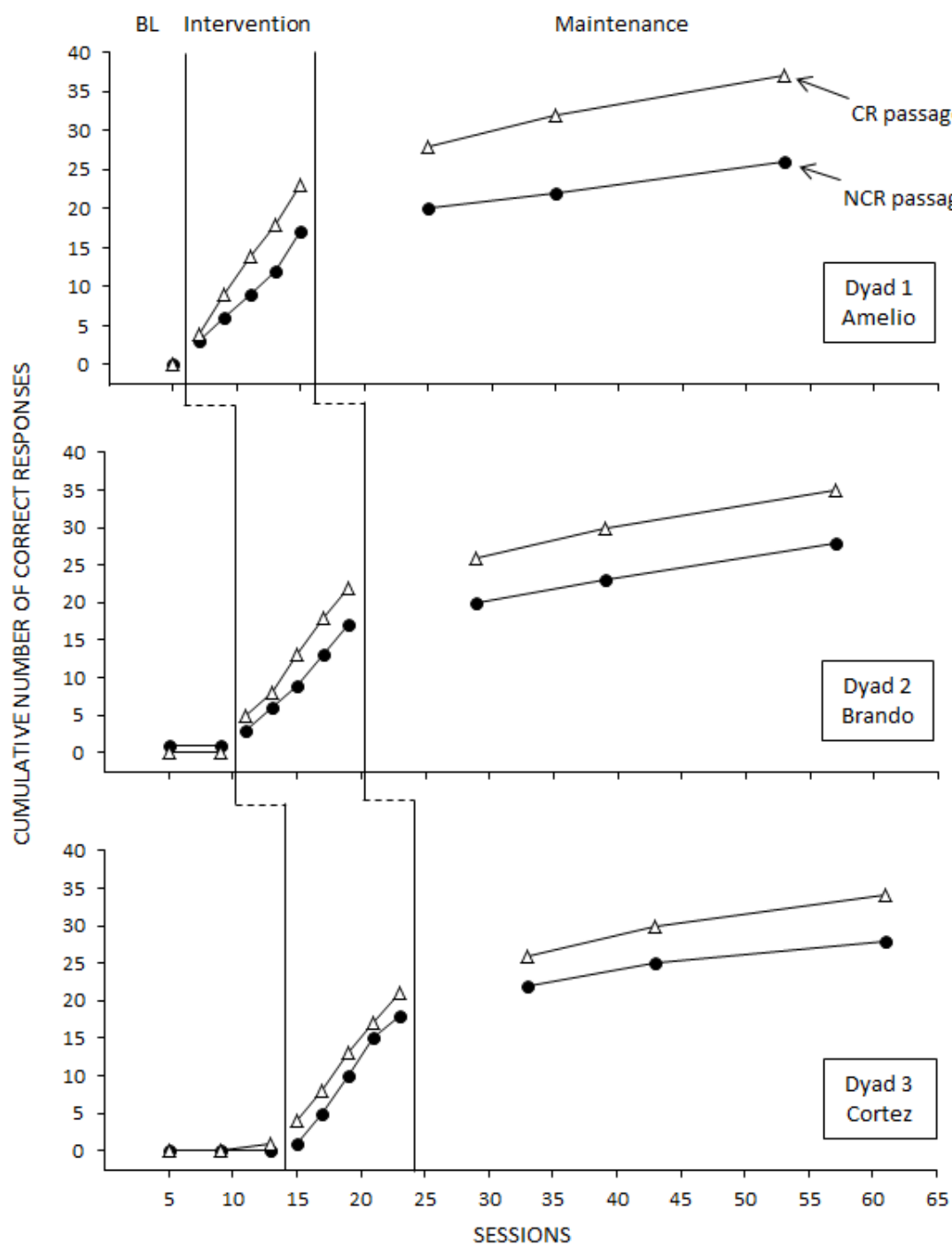
FIGURE 4: Correct responses on CR and non-CR passages for initial tutors.

Social Validity Results

Consumer satisfaction questionnaires. Social validity questionnaires were distributed to the general education teachers, special educator, and families of the student participants. Questionnaires were administered to student participants by the experimenter. All questionnaires were completed on a voluntary basis and distributed after the completion of the last intervention session of the study.

Participants. All six student participants completed the questionnaire. The student questionnaire included 10 items. Participants rated each statement using a five-point scale (from "Strongly Disagree" to "Strongly Agree"). All six participants rated the items "I liked the computer vocabulary lessons," "I thought it was helpful to learn new words based on my life experiences," and "The computer sessions were easy to use" as "Strongly Agree." All six participants agreed that "Learning prefixes and suffixes helped me figure out the meanings of words that I did not know," "The lessons helped me learn new words," and "I can understand what I read better because of these computer vocabulary lessons." Two of the six participants rated "I liked working with my partner" as "Strongly Agree;" the other two participants rated this item as "Agreed." Four of the six participants rated "When words were in Spanish and English, I understood the meanings better" as "Agreed;" the remaining two participants were undecided. Table 4 includes summary information of student ratings.

TABLE 4: The participants' social validity questionnaire responses

Questionnaire item	SD	D	U	A	SA
1. I liked the computer vocabulary lessons.					6
2. The computer sessions were easy to use.					6
3. I liked working with my partner.				4	2
4. When words were in Spanish and English I understood the meanings better.			2	4	
5. Learning prefixes and suffixes helped me figure out the meanings of words that I did not know.				6	
6. I thought it was helpful to learn new words based on my life experiences.					6
7. The lessons helped me learn new words.				6	
8. I feel more comfortable reading harder words because I may already know another word that has the same meaning.				6	
9. I can understand what I read better because of these computer vocabulary lessons.				6	

Note. SD = Strongly Disagree; D = Disagree; U = Undecided; A = Agree; SA = Strongly Agree

Educators. Three general education teachers and one special educator completed the teacher questionnaire. All four teachers reported that they strongly agreed (a) it is important for students who speak English as a second language to acquire grade-level

academic vocabulary, (b) the acquisition of grade-level academic vocabulary will enhance the reading skills of the students in the study, and (c) they have noticed improvement in the participant's vocabulary skills since their involvement in the intervention. Three teachers rated agreement that (a) they may try computer-assisted peer tutoring to enhance the vocabulary skills of students in my classroom, (b) the use of morphemes is a good strategy when teaching vocabulary to students who speak English as a second language, and (c) computer-assisted, peer-delivered vocabulary instruction can be practical for them to use in the classrooms. Three teachers neither agreed nor disagreed with the statement that using culturally responsive materials and teaching practices are important for Latino English learners to learn new vocabulary. Table 5 includes summary information of the teacher ratings.

TABLE 5: The teachers' social validity questionnaire responses

Questionnaire item	SD	D	U	A	SA
1. It is important for students who speak English as a second language to acquire grade-level academic vocabulary.					4
2. The acquisition of grade-level academic vocabulary will enhance the reading skills of the students in the study.					4
3. The use of morphemes (e.g., prefix, suffix, base words) is a good strategy to use to teach vocabulary to				3	1

students who speak English as a second language.

4. Using culturally responsive materials and teaching   3   1

    practices are important for this population to learn new

    vocabulary (for example, use Spanish cognates,

    examples they can relate with from their home).

5. Computer-assisted, peer-delivered vocabulary   1   3

    instruction (as presented in the video) is practical for

    me to use in my classroom.

6. I may try computer-assisted peer tutoring to enhance   1   3

    the vocabulary skills of students in my classroom.

7. I've noticed improvement in the participant's   4

    vocabulary skills since their involvement in the

    intervention.

Note. SD = Strongly Disagree; D = Disagree; U = Undecided; A = Agree; SA = Strongly

Agree

Families. Four of the students' families returned the family questionnaire. The

questionnaire was sent home in Spanish following a personal phone call from the

researcher with a translator. All participating parents rated all nine items as "agree."

Table 6 presents the families' social validity questionnaire responses.

TABLE 6: The families' social validity questionnaire responses

	SD	D	U	A	SA

1. It is important for my child to learn English vocabulary.	4
2. It is important for my child to use Spanish to help him/her learn English.	4
3. It is important to use aspects of my child's culture in teaching to support my child's learning.	4
4. Having students work together to learn English vocabulary is a useful way of learning for my child.	4
5. Using computer program is a good way to teach English for my child.	4
6. I think my child likes learning from this program.	4
7. I think my child improves his/her vocabulary as a result of this program.	4
8. I think my child improves his/her reading comprehension as a result of this program.	4
9. I would recommend the program to others (parents, teachers) as a way to improve English learning.	4

CHAPTER 5: DISCUSSION

The purpose of this study was to extend preliminary research and examine the effects of a culturally relevant, explicit computer-assisted and peer-mediated intervention on vocabulary acquisition and generalization of English learners (ELs) with learning disabilities (LD) in upper elementary grades. In addition, this study sought to measure and compare data collected on the six participants' ability to generalize learned vocabulary on culturally responsive and non-culturally responsive passages using a cloze procedure. The intervention design provided multidimensional (a) representations of taught vocabulary (written, audio, English, Spanish, graphics), (b) expression of student learning (hear, say, read, write), and (c) active engagement (active student responding, choice, feedback, media-prompted responses). Results indicated a functional relation between the intervention and academic vocabulary acquisition and generalization for all six participants. All participants also performed slightly better when responding to the culturally responsive passages. In addition, teachers reported that the intervention was valuable and overall, feasible; the participants reported a higher level of known vocabulary that have improved reading comprehension and all participants liked working with peers and using a computer program to learn new, sophisticated vocabulary. Discussion points related to these results will be presented in this chapter, along with specific contributions of the study, limitations, recommendations for future research, and implications for practice.

Effects of the Intervention on the Dependent Variables

Two analyses were used to determine the results of this study. As standard for interpreting results of single case design research, visual analysis of the data was used to determine level, trend, variability, overlap, and immediacy of effects. In addition, nonoverlapping data (PND) method was used to determine data overlap between phases (i.e., baseline and intervention) counting the number of data points in the intervention phase that do not overlap with the highest or lowest data points in the baseline phase, dividing by the total number of data points in the intervention phase, and multiplying by 100 (Scruggs & Mastropieri, 1998, 2013). However, because PND for all participants in this study was 100%, the results confirmed what could be determined using visual analysis alone. Discussion below will be provided with regards to each research question.

Research Question 1: What are the effects of culturally relevant, peer-delivered, computer-assisted vocabulary instruction on academic vocabulary acquisition of Latino ELs with LD?

The results of this study demonstrate a functional relation between the intervention and the number of acquired academic vocabulary. For all six participants, the data paths indicate an immediate change in both level and trend during the intervention condition when compared to their baseline performance. Overall, the treatment effects were consistent across participants. When results from all participants in this study were aggregated, the baseline mean for correct responses on acquired academic vocabulary was consistently low ($M = .425$; $R = 0-1$). All six participants' correct responses on acquired academic vocabulary immediately increased upon entering the intervention phase of the study ($M = 8.9$; $R = 6-10$). During the maintenance condition, all six

participants were observed to show a gradual decreasing trend indicating fewer correct responses on the acquired academic vocabulary probes over time ($M = 6.6$; $R = 5\text{-}10$) than during the intervention phase; however, all participants remained substantially above baseline levels for all five maintenance sessions over an 8-week period. A possible reason for the gradual decline may be related to the number of words being taught per session. In this study, a total of 10 words were taught. Most research on effective vocabulary instruction recommends teaching a set of academic vocabulary words with intensity across instructional sessions (Beck et al., 2002; Carlo et al., 2004; Vaughn et al., 2009). It may be that high level of maintenance data will require more repetition and more intensity of practicing the same words.

Despite the data evident to support an increase in acquired academic vocabulary knowledge of Latino ELs with LD, a descending trend was observed during the maintenance phase for all six participants. One reason may be the lack of embedded use of the taught vocabulary across environments. All participants reported that they did not like to raise their hand to answer teacher-directed questions during class even if they felt like they knew the answer. This could be a very telling statement in that newly learned information must be practiced in a comfortable learning setting until firmly known, otherwise, what was learned can easily be forgotten. This is consistent with findings and suggestions from past research regarding the importance of fluency building once acquisition has been achieved (August et al., 2009; Carlo et al., 2004; Lesaux, 2010; Vaughn, 2009). However, the positive outcomes from all of the six participants present important contributions to the field. First, these findings are consistent with previous research for both populations of ELs and students with LD showing the effectiveness of

providing explicit vocabulary instruction that (a) targets both breadth and depth of word knowledge (e.g., Jitendra et al., 2004; Lesaux et al., 2010),(b) teaches the use of word-learning strategies (e.g., Calderon et al., 2011; Carlo et al., 2004; Ciullo et al., 2014; Goodwin & Ahn, 2010), and (c) uses peer delivered computer-assisted instruction (Anderson et al., in preparation; Wood et al., 2010).

To date, no other study has included participants who were dually identified as both ELs and students with LD for vocabulary instruction that addressed cultural, linguistic and disability needs. This study included participants who were Latino ELs with identified disabilities in reading. Prior studies have shown that vocabulary instruction that move beyond simple definitions that require rote memorization to focus on building depth of word knowledge presents promise in strengthening vocabulary and comprehension skills of students in upper grades (Nagy et al., 2014). Consistent with previous research found on academic vocabulary emphasizes the importance of teaching general academic vocabulary that is found in content-area classes and textbooks, and explicit teaching of word morphology. According to multiple authors (e.g., Bailey, Butler, Stevens, et al., 2007; Beck et al., 2002; Calderón et al., 2005), general academic vocabulary is frequently neglected in both language and content instruction. The literature suggests that this general academic vocabulary is critical for students to understand the concepts associated with academic content and demonstrate their understanding of what is read (Beck et al., 2002; Calderón, 2007). This study adds to the paucity of research on implementing such intensive vocabulary instruction for ELs with LD that show the importance of explicit instruction in the structure of words, which involves knowledge of roots and affixes, and how these units work to change the

meaning and usage of words. Findings are also consistent with Wong Fillmore and Snow (2000) in that students can learn words faster and more efficiently if they are instructed in the relationships between word forms.

Second, using word learning strategies with the use of instructional tools to teach vocabulary has shown promising effects for ELs and those with LD (Anderson et al., in preparation, August et al., 2009; Proctor et al., 2011; Silverman & Hines, 2009; Vaughn et al., 2009; Wood et al., 2012). Similarly, in this study, the intervention included explicit instruction with embedded, student friendly definitions, Spanish cognates, multiple examples and nonexamples, visual representations of taught vocabulary and graphic organizers. These were used in effort to accelerate English academic vocabulary learning by anchoring newly learned content from familiar context that was also engaging and tailored specific for the participants. Additionally, this study extends current literature (Anderson et al., in preparation; Wood et al., 2012) and further supports the use of computer-assisted, peer-mediated instruction found to be an evidence-based practice for both ELs and students with LD. This is the first empirical study that has embedded effective vocabulary instruction (i.e., teach academic vocabulary explicitly using word learning strategies) for both ELs and students with LD while simultaneously implementing a culturally relevant peer-mediated program delivered on a computer. The combination of these three components complimented the feasibility in which the intervention was delivered.

An important part of the intervention in this study, involved peers delivering the instruction. Specifically, participants served as both teachers and learners in this study, lending the student pairs multiple opportunities to interact, respond, and stay actively

engaged. One of the many benefits of peer interventions are the increased number of opportunities students have to actively participate in their learning which shows to greatly improve performance outcomes (Heron et al., 1983; Saenz et al., 2005; Stenhoff & Lignugaris, 2007). Furthermore, all content within the lessons were relevant to their lives in some capacity, which perhaps, made the lessons more engaging and easier to learn new vocabulary. This is consistent with research supporting that students, particularly, culturally and linguistically diverse students, need to make meaningful connections to vocabulary by first reflecting on prior knowledge and then linking what is known to new information (Beck et al., 2002; Tompkins, 2004). Finally, the intervention was delivered on the computer through the PowerPoint program. Computer-assisted instruction ultimately was the vehicle that navigated the students to deliver the intervention to their peers errorless and with high fidelity. All lessons through the PowerPoint program allowed for each dyad to (a) teach at a comfortable pace, (b) provide immediate feedback, (c) click audio prompts for English and Spanish vocabulary, (d) see visual representations of vocabulary taught, and (e) stay consistent with delivering the lesson. This is consistent with research that supports using computer-assisted instruction with students who need additional specialized instruction (Clarfield & Stoner, 2005; Okolo & Bouck, 2007; Stetter & Hughes, 2010). It should be noted the participants in the current study all received specially designed instruction provided by a special educator for an hour per day, 5 days per week in a resource classroom throughout the study; however, their progress prior to the intervention was limited. The implementation of the intervention provided clear evidence that the participants learned new vocabulary at an accelerated rate with the support of the intervention.

Research Question 2: What are the effects of culturally relevant, peer-delivered, computer-assisted vocabulary instruction on academic vocabulary generalization of Latino ELs with LD?

In the current study, participants responded to two passages in a cloze format during each generalization data collection session. Results of this study show that a functional relation between the intervention and the number of generalized academic vocabulary. For all six participants, the data paths indicate an immediate change in both level and trend during the intervention condition when compared to their baseline performance. Overall, the treatment effects were consistent across participants. When results from all participants in this study were aggregated, the baseline mean for correct responses on generalized academic vocabulary was consistently low (M = .583; R = 0-2). All six participants' correct responses on generalized academic vocabulary immediately increased upon entering the intervention phase of the study (M = 8.06; R = 4-10). During the maintenance condition, all six participants' data were observed to remain high indicating participants correctly responded on the generalized academic vocabulary probes over an 8-week period.

An important component of the intervention was the culturally relevant features added to the study. Prior to implementing the study, informal interviews were conducted with each of the participants and family members to collect information that could not be gathered otherwise, known as, "funds of knowledge" (Moll et al., 2001). Collectively, the information gathered and categorized "culturally and contextually relevant" (Sugai et al., 2001) features. Specifically, themes included: ethnicity, disability, race, gender, age, socioeconomic status, religion, geographic context, immigration status, and nationality.

In addition, themes were also generated from the participants' history of lived experiences. These experiences were extremely valuable to provide contextual relevance for creating the instructional lessons and culturally relevant passages. The combination of these components may have contributed to the increased acquired vocabulary knowledge and ability to generalize learned vocabulary to grade level connected text. First, all lessons were developed by introducing an English vocabulary word that was confirmed as known by the students as a vehicle to learn more sophisticated words with the same meaning; also, content such as graphics, examples, nonexamples were tailored to ensure relevance to the participants' personal lives. For example, each of the participants either regularly attended or sold merchandise each Saturday during the warmer months of the year at a local Farmer's Market. Perhaps this component allowed the participants to retain novel vocabulary at a faster rate and allowed for the participants to generalize their knowledge to connected text. In addition, the presence of other same grade level tutor(s) and tutee(s) interacting with other peers who have similar experiences and "funds of knowledge" may have prompted participants to transfer the skill from intervention sessions to generalization measure. Second, all lessons were prepared and taught in English. Perhaps students became more comfortable using novel English vocabulary because of the multiple opportunities students responded during the peer-mediated instruction. It is likely that the combination of speaking English in a controlled environment with a similar peer in a similar situation contributed to the participants' increased acquired English academic vocabulary and generalization on passages.

Research Question 3: To what extent are there differential effects of the intervention on targeted vocabulary generalization of the participants using culturally relevant (CR) and non-CR passages?

A unique feature of this study was to examine if the participants generalized their vocabulary learning to both culturally relevant (CR) and non-culturally relevant (non-CR) passages and whether the participants performed better on one type of passage than on the other type. This study used a simultaneous treatment design to examine differences on vocabulary generalization between two passage variations. Cumulative data on the participants' correct responses on both types of passages showed that the generalization of academic vocabulary was slightly higher for all six participants during the CR passage condition, when compared to the non-CR passage condition. Visual analysis of the data indicated a noticeable separation between the two conditions during the intervention condition for all six participants, and the discrepancy broadened across the maintenance condition.

The results from this study are preliminary findings that show culturally relevant passages that were accustomed to the participants show better outcomes than the non-culturally relevant passages across all participants. Researchers have convincingly argued that allowing students to explore how content learning informs and connects with their own lives and local community can increase interest and motivation in authentic critical thinking and problem-solving in content area classes (Cartledge et al., 2008; Ford, 2012; Gay, 2002; Proctor, Carlo, August, & Snow, 2005). Evidence from this study's findings indicates that participants were better able to understand and use semi-familiar or newly taught vocabulary when used in familiar context, but most fascinatingly participants were

better able to retain and recall vocabulary that was learned. Data from this study show that the most significant results shown are during the maintenance phase of the vocabulary generalization measure using the culturally relevant passage condition. In addition to making the curriculum more relevant and inclusive, providing ELs with texts that are validating of their identities is another way of connecting the curriculum to students' lives. Perhaps culturally responsive passages can serve as an assessment tool to measure prior knowledge of students as well as serve as a springboard to anchor known or relevant concepts to unknown concepts such as informational text.

Another interesting finding, although anecdotal, was the amount of time the participants spent on completing each passage. Overall, participants finished CR passages 1 min and 3 s faster than non-CR passages. This time difference could be attributed to a number of reasons. First, it may be that the participants found the CR passages to be more personal, familiar, and relevant to their daily lives; as a result, they showed a higher level of engagement in completing the CR passages. Second, using content that was culturally relevant based on the participants' lived experiences may have primed the participants' background knowledge that further increased their comprehension and ease of passage completion, Third, anecdotal observations of the participants' nonverbal responses showed that participants demonstrated higher levels of concentration when completing the CR passages than when completing the non-CR passages. For example, during one of the sessions, Andres look away from the non-CR passage seven times compared to zero times from the CR passage. In another instance, during a session, Cortez grabbed his hair twice, shook his head, and used his finger to swipe under each word for two sentences on three different occasions when completing the non-CR passage, and did not engage in

any of these behaviors when reading the CR passage. Although these are isolated examples of two scenarios, the experimenter observed many instances similar to these examples in other participants. An educational assumption may be that the non-CR passages were boring, the vocabulary was too difficult, or the content was contextually unfamiliar. It is important to note that regardless of the assumed reasons, all of these assumptions can and do affect one's motivation to read (Cooper, Heron, & Heward, 2007). Specifically, participants who found a passage that was interesting, easy to read, and/or relevant to their own personal lives engaged in the reading more intensively; the reading itself in turn became the reinforcement. These explanations could have also contributed to the increased performance data during maintenance phase, supporting the benefits of reading CR passages.

Research Question 4: What are the teachers' perspectives on the importance, acceptance, and effectiveness of the intervention?

All teachers indicated that teaching academic vocabulary to Latino ELs with LD is critical. Importantly, all teachers noted marked improvement in the participants' reading comprehension skills and use of oral language in the classroom. These results are consistent with research on teacher preferences regarding computer-assisted instruction (Cheung & Slavin, 2012). Cheung and Slavin (2012) conducted a review of literature and found the majority of teachers indicated computer-assisted instruction was most effective in helping them provide additional instructional support for at-risk learners. Cheung and Slavin suggests embedding evidence-based instruction within a computer-assisted program may be an effective method to ensure at-risk learners receive regular interventions provided with fidelity. Teachers in this study indicated, "the sample lessons

were helpful and they plan to use the intervention to increase vocabulary of other students." Although all teachers noted a marked improvement in the participants' comprehension and oral language in the classroom, three of four teachers were undecided whether using culturally responsive materials and teaching practices was important. The fourth teacher did agree using culturally responsive materials and teaching practices was important. Perhaps there is a reason for such results. One possibility for the indecisiveness from the teachers is that this particular school delivers English-only instruction, meaning all teachers and students are expected to speak English when communicating within the school environment. The ESL teacher also speaks English only during instruction. Within the school, there were three fluent Spanish-speaking employees, two office staff, and one administrator. This could deter teachers within this particular school from using instructional enhancements such as providing Spanish cognates along with English vocabulary. Furthermore, most staff were White, female, and not local (i.e., 10 min driving distance or more), sharing a very different profile from that of the participants. However, when showing the sample lessons, all teachers seemed enthusiastic about the authenticity of the lessons. Perhaps, the cultural expectations of the school world's view of curriculum, and lifestyle differences between staff and participants had an effect on the teachers' perspective of the intervention and importance of culturally relevant aspects.

Research Question 5: What are the participants' perspectives on the importance, acceptance, and effectiveness of the intervention and preference of the passages for generalization?

Through a consumer satisfaction questionnaire, all six participants reported their perceptions about the intervention. All participants felt that they had improved their English vocabulary and reading comprehension. The participants also indicated that they enjoyed learning with a peer and via a computer. Additionally, all participants preferred reading passages that were culturally relevant over the non-culturally relevant passages. Of the more fascinating findings were the consistent responses of the participants with the data. There was a clear differentiation between the culturally relevant and non-culturally relevant passage conditions. It seems that above and beyond the evidence that supports students in this study were able to generalize learned vocabulary to grade level passages, participants showed greater knowledge when responding to passages that were relevant to their life experiences which also included culture, family and the community in which they live. Participants were clear in their responses on the consumer questionnaire that they preferred the passages that related to their lives. Perhaps these data support that students are better able to recall previously learned vocabulary when fostered with connected text that uses background knowledge and personal experiences of the learner. Also, perhaps this led to participants' increases in the number of correct responses and then their becoming more confident in vocabulary acquisition and reading comprehension.

Research Question 6: What are the perspectives of the parents of the participants on the culturally relevant features that address language and ethnicity of the intervention (i.e., adding Spanish cognates and reading Latino specific literature)?

Through a consumer satisfaction questionnaire, four of the six participants' mothers reported their perceptions about the intervention. All mothers indicated that they

felt it was important for their child to learn English. The mothers also indicated that including Spanish and aspects of their child's culture into the lessons would support their child's learning. All mothers enjoyed that their child worked with a peer to learn vocabulary and believed that working with a peer was useful teaching method. All mothers agreed the intervention improved their child's reading comprehension and would recommend the intervention to others as a means to improve English learning. These findings are ambiguous yet telling for a few reasons. There are a number of reasons this could be. First, the experimenter did not speak fluent Spanish. Although, this was not bothersome to the experimenter and did not appear to be bothersome to the mothers, fluid verbal communication was obstructed because translation was needed. Additionally, this questionnaire was conducted within the confinement of the school, which set the tone for a more formal and austere conversation. However, it should be noted that the experimenter attempted to take a stroll with the mothers, but the translator was confined to the building (for potential translation emergencies in the office). One potential and unforeseen barrier was the response format of the questionnaire. Three of the four mothers had a difficult time distinguishing a meaningful difference between strongly agree and agree. Andres' mother reported that she could either agree or disagree, the other options made it too complicated. One or a culmination of these factors could have influenced the mothers' responses as either being not as forthcoming or as accurate on the social validity questionnaire.

There were important comments made by two mothers that cannot be used for generalization purposes, but nonetheless, are relevant. As stated previously, all mothers' selected "agreed" for all responses. However, an open-ended question was asked related

to adding any questions or comments about the intervention. Although, there were only two responses, they shed insight from the perspective of two of the participant's parents. First, Cortez's mother wanted to send gratitude. She said, "thank you so much for helping my son with his disability; my family helps Cortez with his disability at home because I don't read in English, just in Spanish." The second comment was made by Andres' mother who said, she "was so happy the other day when Andres told his little brother, who was cold to "visualizer en la play." She laughed and could not believe he had learned that in school. Cortez's mother's comment, although cannot be generalized, coincides with lines of research on cultural differences and views of disability (Harry, 2008), gratitude for educational support (Ceballo, 2004), and language barriers that connect home and school (Pena, 2000). Both mother's comments coincide with research that suggests Latino parents and students value instruction that includes English and Spanish that can support development beyond language development (Lee, 2006).

Specific Contributions of this Study

This study adds to the preliminary body of research that indicates Latino ELs with LD can learn academic vocabulary and generalize this knowledge in order to better understand grade-level sophisticated text (Anderson et al., in preparation; August et al., 2009; Carlo et al., 2004; Lesaux et al., 2010; Vaughn et al., 2009).

This study makes a significant contribution as the first study to investigate the effects of culturally relevant, computer-assisted peer-mediated vocabulary instruction with Latino ELs with LD. As a result, the study provides empirical evidence that can be used as a model for use in schools to support teachers' to use efficient, low cost research-based strategies that improve academic vocabulary of Latino ELs.

First, participants included in this study were Latino ELs with LD in reading. To date, no other study has included participants who were dually identified as both ELs and students with LD for vocabulary instruction that addressed cultural, linguistic and disability needs. This study adds to the paucity of research on implementing such intensive vocabulary instruction for ELs with LD that show the importance of explicit instruction in the structure of words, which involves knowledge of roots and affixes, and how these units work to change the meaning and usage of words.

Second, this is the first study to use a culturally relevant vocabulary instruction in an empirical study. This is the first empirical study that has embedded effective vocabulary instruction (i.e., teach academic vocabulary explicitly using word learning strategies) for both ELs and students with LD while simultaneously implementing a culturally relevant peer-mediated program delivered on a computer. The combination of these three components complimented the feasibility in which the intervention was delivered. Most importantly, the current study provides evidence that contributes to the limited literature on the effectiveness of culturally relevant instruction (Brophy, 2011; Lo et al., 2011; Robinson-Ervin, 2012) and presents the first empirical study that clearly defines culturally relevant components within the vocabulary intervention that can be systematically replicated to involve Latino ELs with LD.

Third, results from the social validity data were overall positive in supporting the usefulness, importance and noticing the improvement in students' performance. Due to new accountability requirements Common Core State Standards (CCSS) for English Language Arts (ELA), most general education teachers feel pressured to focus on the language demands of each content area; students who meet the Standards are described as

those who "develop the skills in reading, writing, speaking, and listening that are the foundation for any creative and purposeful expression in language" (Standards, p. 3). Culturally relevant peer delivered computer assisted instruction may offer a way to provide an intensive intervention for ELs who are LD that is feasible enough to be implemented in the general education and the special education classroom.

Limitations and Future Research

There are several limitations of this study. First, participants in this study were all males. The inclusion of all male participants was not purposeful; however, because there were a limited number of students who were dually identified as ELs and LD and who also met inclusionary criteria, participants happed to be all male students. Although having all male participants strengthens this study's internal validity, gender may have given an exaggerated sense of feasibility for developing culturally relevant theme-based instruction. For example, all participants had recently watched a newly released action movie titled, Robocop, about a cyborg (robot-man) that has to defeat a corrupt society's evils. This is an action-packed "boy movie," as Amelio so eloquently categorized the film. This is a basic example of a broader limitation. The participants had many characteristics in common in that they were all Latino, males, and from the same neighborhood. Since cultural features were used to derive assessment and instructional materials, sorting features into thematic culturally relevant content that can be used with multiple students may not be as feasible with more diverse students within Latino ELs as was done in this study. Furthermore, it is unknown how these particular cultural features intersect or precede in value over another, or if any at all. Future research should replicate this study with other populations. For example, including students who are Latino ELs

identified as having a Speech Language Impairment (SI), or Latina ELs will broaden subject generality. This particular intervention also lends flexibility for use with younger Latino students for prevention measures. For example, research has found that although not identified as having a disability, many at-risk Latino EL readers are noticeably behind grade level in kindergarten and the discrepancy widens in higher grades (Artiles et al., 2005; Hosp & Reschly, 2004; Klingner et al., 2006). Future research is warranted to examine how the culturally relevant, peer-delivered vocabulary instruction may be suitable for younger Latino students.

Second, the data collected were limited to multiple choice or fill-in-the-blank responses in English that was controlled by script delivered on the computer or a cloze passage on a sheet of paper. Often times, peers wanted to share experiences with each other. Perhaps offering interactive grouping to promote sharing of their experiences would positively affect vocabulary acquisition. It seems natural in a peer-mediated situation using content that is relevant to both students. Future research may include adding discussions that are sophisticated and promote opportunities to use novel words during these discussions for data collection (e.g., counting the number of instances in which the participants used the learned vocabulary words correctly in the context of verbal discussions in a group setting). It is also important to further document and analyze the vocabulary words that are most often used within the interactions. Furthermore, future research may include measuring the number of pages read over a period of time and having participants retell, counting differences among CR words retold versus non-CR words retold, in order to have a more direct measure of the participants' reading comprehension of CR and non-CR passages.

The third limitation is that because this study used a packaged intervention it is unclear as to which components were most relevant or important for the change in the dependent variables. Future research could parse out one variable at a time to measure the effectiveness of the intervention without one of the strands.

Fourth, this study did not prescreen for Spanish cognate knowledge. For example, Spanish cognates were included in the intervention when teaching a novel sophisticated vocabulary word. In certain instances, the Spanish cognates did provide an added foundation of knowledge for the students. Andres explained that the Spanish version of the word infer, *infierie* was confusing because he "didn't know [he] was coming to these classes to learn new Spanish words too!" Although descriptive analyses were not conducted in this study, Andres point is well clearly made. Adding Spanish cognates to English vocabulary alone may not be the most effective use of infusing students' native language into lessons but perhaps, assessing cognate knowledge prior to instruction can serve as a formative measure to (a) serve as baseline of cognate knowledge, (b) drive instructional methods, and (c) measure Spanish vocabulary growth over time. A hypothetical scenario might be a student who has prior knowledge of the Spanish word, *ilustra,* however, does not know the English version illustrate (e.g., doesn't recognize it and cannot figure out the meaning within context of a sentence). Instruction could begin by stating "illustrate is the English word for ilustra" which already connects and provides meaning for the students. This is a much faster process of teaching and learning as opposed to a situation when the English and Spanish vocabulary word is unfamiliar. Assessing cognate knowledge prior to the intervention may provide a number of benefits. First, because Spanish cognates are already a recommended practice when teaching ELs

vocabulary (Baumann et al., 2014), it is best to not haphazardly use them without thoughtful consideration as why, when, how they should be used within the instruction. Also, the goal of special education is to ameliorate skill deficits with intensity and urgency. Perhaps sorting important vocabulary to be taught by Spanish cognate proficiency levels may hold the potential to increase important English vocabulary at an accelerated rate. Lastly, it has long been a concern that many Latino ELs who are educated in English-only schools lose their native language over the years (Baca & Cervantes, 1998r). Future research should collect data on novel Spanish vocabulary that is learned in conjunction with English vocabulary. This in turn, may offer benefits such as increasing native vocabulary of our linguistically diverse students, increasing teacher awareness, knowledge and use of languages other than English, and potentially increase second language use of English-only speaking students. On a broader scale, these suggestions for future research align perfectly as an effort in preparing students to be college and career ready (CCSS, 2010). For example, one of the English Language Arts Standards (CCSS-ELA, 2010) addresses the importance of college and career ready students coming "to understand other perspectives and cultures." The statement continues:

> Students appreciate that the twenty-first-century classroom and workplace are settings in which people from often widely divergent cultures and who represent diverse experiences and perspectives must learn and work together. Students actively seek to understand other perspectives and cultures through reading and listening, and they are able to communicate effectively with people of varied backgrounds. (p. 3)

Fifth, in this study, a reading expert and an ESL teacher served as content "experts" to validate the appropriateness of all lessons. Although highly qualified based on the state's teacher credential standards, the ESL teacher was unfamiliar with five of the six participants in the study, did not speak Spanish (native language of all participants), and was unfamiliar with the lived experiences of these children. As a result, the ESL teacher may not have been a "true" expert to provide validation on the cultural and linguistic sensitivity of the lessons. Future research should include more than one expert with knowledge in cultural and linguistic characteristics of Latino students in order to provide the most valid assessment of the materials.

The final limitation relates to the experimenter being responsible for training and serving as the interobserver, presenting possible observer bias. As an attempt to minimize observer bias, an educational stakeholder who was unaffiliated with the study was the primary data collector and conducted procedural fidelity data collection. Future studies may be structured so that outside stakeholders not involved in providing the training serve as data collectors.

A final consideration for future research is to consider conducting mixed methods research. This particular research approach offers the flexibility to employ rigorous quantitative research by assessing magnitude and frequency of dependent variables and rigorous qualitative research by exploring the meaning and understanding of these variables (Johnson, Onwuegbuzie, & Turner, 2007). One possibility would be to conduct in-depth interviews with parents, students, and teachers exploring "funds of knowledge" (Moll et al., 2001) and "funds of identity" (Esteban-Guitart & Moll, 2014) themes between and within groups using the results from the interviews to create lessons for the

intervention that are culturally and contextually relevant to students, parents, and/or teachers. Then proceed with a single case research design to measure the effects of the culturally relevant vocabulary intervention. By including qualitative investigation, future investigators can study new questions and initiatives, complex phenomena, hard-to-measure variables, and interactions across settings focused on culturally and contextually relevant instruction for Latino ELs in U.S. schools.

Implications for Practice

The results of this study indicate a number of recommendations for practice. First, results indicate culturally relevant peer-delivered, computer-assisted vocabulary instruction as an effective and practical method of teaching grade-level vocabulary to EL students with learning disabilities in the classroom settings. This may be an important implication in that this intervention shows promise as an avenue for teachers to provide specially designed instruction (special education) to students with the highest needs with very little teacher supervision. The lessons in PowerPoint format could be used for whole class peer tutoring, or small group instruction to enhance or remediate vocabulary. For example, the peer-delivered computer-assisted instruction could be used to preteach critical vocabulary before an upcoming lesson or used as judicious review of previously learned vocabulary. Both general education and special education teachers could use this intervention as a literacy station; this is where students rotate among learning stations that are focused on teaching the same big idea yet receive multiple modes of explicit delivery (e.g., teacher directed, peer-mediated, active student responding). Students learn and remember more when they are familiar with the content they are reading. Additionally, all lessons through PowerPoint allowed for each dyad to (a) teach at a comfortable pace,

(b) provide immediate feedback, (c) click audio prompts for English and Spanish vocabulary, (d) see visual representations of vocabulary taught and (e) stay consistent with delivering the lesson. This format may provide a useful framework for teachers to adapt to address individual students' needs.

Second, students are more interested in reading texts with engaging and relevant topics and are able to understand when reading meaningful and familiar content that provided context for the concepts they were learning (Klingner & Boardman, 2012). Perhaps culturally responsive passages can serve as both an assessment tool and a springboard to anchor known or relevant concepts to unknown concepts such as informational text. In this study, the participants were Latino ELs with LD who received typical classroom instruction from a general education teacher and specially designed instruction from a special education teacher. The participants' vocabulary learning did not improve until the intervention was implemented. As supported from the data in this study, at-risk Latino ELs with LD can benefit from more intensive level of support in building their vocabulary knowledge. Another possible implication is to use culturally relevant passages as materials for a tier 2 reading intervention to supplement the core curriculum for students exhibiting at-risk data and those with disabilities. Using curriculum based measurement (CBM) procedures, students could be given standardized reading probes (passages) at regular weekly or bi-weekly intervals that are scored for reading accuracy and speed. Additionally, a comprehension retell procedure, that calculates the number of words retold and level of vocabulary sophistication used in each passage retell can be helpful. In higher grades, students could create a written product with the same vocabulary and comprehension measures. Furthermore, teachers can use

the results to quantify short- and long-term student gains toward end-of-year goals. This would serve as a feasible and technically strong approach for quantifying student progress frequently as a prevention technique

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APPENDIX A: SAMPLE GENERALIZATION PROBE CLOZE PASSAGES

Culturally Relevant Passage

Prepare	deport	rigorous	portable	reverse	Incredible	intermediate

My parents are thrilled with the speed and pace in which I have learned English while in school. They often admit that they feel good that they have provided an opportunity for me to earn a quality education in a second language. They are very proud of me and say I amaze them that I am incredible. Next year I'll be going to middle school at Porter Ridge. I hear this is relatively a new school. I'm very thankful that my teachers are paying extra attention to help me prepare for the courses and transitions that I'll experience next year. Since 6th through 8th grades are in between elementary and high school grades, my teacher always calls Porter Ridge an intermediate school; My teachers says that I should expect that work harder than what I am used to now. Although middle school might be hard work and the classwork rigorous, I am excited because one of my friends that already is in middle school told me that we get portable laptops that we carry around with us!

Non-Culturally Relevant Passage

prepare	deport	rigorous	portable	reverse	incredible	intermediate

No one can predict when an earthquake will occur. Some earthquakes are barely felt and cause little damage. Others are disastrous and damage is extensive. One earthquake in San Francisco, California in 1906 was expected to be an intermediate earthquake, which means somewhere in between a mild and a severe earthquake. However, the people living in San Francisco found the earthquake to be incredible; they were shocked by the massive destruction to their city. Gas leaks triggered explosions that ruined homes. People were not able to prepare for this life transition and many took what was portable from their destroyed homes and abandoned the rest. Although the city was destroyed, the victim's spirit could not be broken. People worked under rigorous circumstances to rebuild the city of San Francisco.

APPENDIX B: STUDENT SURVEY FORM

APPENDIX C: CONTENT VALIDITY CHECKLIST

Evaluator: _____   Date: _____

Does the lesson include the following components in the PowerPoint slides (Yes or No)? _____
Lesson #: _____

Component	1st set of words (e.g., edible, inedible, etc.)	2nd set of words (e.g., digest, digestible, etc.)	3rd set of words (e.g., ingest, ingestible, etc.)
Circle Y or N			
Selection of Vocabulary			
1. Includes target vocabulary that is 5th grade appropriate	Y / N	Y / N	Y / N
2. Includes target morphemes (prefixes, suffixes and roots) that are 5th grade appropriate.	Y / N	Y / N	Y / N
Structure of the PowerPoint® Lesson			
3. Includes a title slide with the purpose of the lesson.	Y / N	Y / N	Y / N
4. Introduces 1-3 basic word as a previously known word (e.g., eat).	Y / N	Y / N	Y / N
5. Provides a sentence for each word using the known word (e.g., eat).	Y / N	Y / N	Y / N
6. Contains an audio prompt for the target word (e.g., edible).	Y / N	Y / N	Y / N
7. Directs tutee to say the target word (edible) (2x).	Y / N	Y / N	Y / N
8. Provides a student-friendly definition with pictures.	Y / N	Y / N	Y / N
9. Prompts participants to highlight the target word on the "chart."	Y / N	Y / N	Y / N
10. Introduces the Spanish version of the target word with an audio prompt.	Y / N	Y / N	Y / N
11. Prompts to underline similar topography of the English and Spanish cognate.	Y / N	Y / N	Y / N
12. Introduces question 1 and provides two possible responses. (e.g., Is an apple edible or not edible?)	Y / N	Y / N	Y / N
13. Provides correct response to the question above with feedback.	Y / N	Y / N	Y / N
14. Introduces question 2 that addresses the target word and provides two possible responses.	Y / N	Y / N	Y / N
15. Provides correct response to the question above with feedback.	Y / N	Y / N	Y / N
16. Introduces a short selection with question 3 that is open-ended (does not offer response options).	Y / N	Y / N	Y / N
17. Prompts tutor and tutee to draw a quick sketch to relate to the target word.	Y / N	Y / N	Y / N
18. Introduces a morpheme that connects to the target word (e.g., in+edible).	Y / N	Y / N	Y / N
19. Defines morpheme separately then with the target word.	Y / N	Y / N	Y / N
Cultural and Linguistic Responsiveness			
20. The lesson targets examples and literature that is important to Latino students.	Y / N	Y / N	Y / N
21. The lesson uses language and Spanish cognates appropriate for Latino students	Y / N	Y / N	Y / N
22. The lesson materials are culturally relevant and sensitive to Latino students.	Y / N	Y / N	Y / N

APPENDIX D: PROCEDURAL RELIABILITY CHECKLIST

Date: _____
Direction: Check/mark under Yes or No for each step to be completed by the tutor

Tutor's name:		
Instructional Steps	**Yes**	**No**
Vocabulary Instruction		
affixes: _____ words: _____		
Tutor introduces the lesson (*Tutor says*: "We are going to use words we know to learn new words").		
Tutor activates audio of an example sentence using the new word (*Audio says*: "A laptop is portable.")		
Audio pronounces the word (*Audio says*: "Port..ub..le; Portable")		
Tutor prompts tutee to say the word together (*Tutor says*: "Let's say portable"… "one more time…")		
Tutor provides a student-friendly definition of the word (*Tutor says*: "Portable means something that can be carried")		
Tutor prompts tutee to respond to questions (*Tutor says*: What means something that can be carried? [then] *Tutor says*: What does portable mean?")		
Tutor provides feedback (*Tutor says*: "Yes! Portable means something can be carried")		
Tutor provides examples pictures (*Tutor says*: "laptops, phones, bookbags, and purses are all portable").		
Tutor prompts tutee to highlight the word on the graphic organizer.		
Tutor activates Spanish cognate if available (*Tutor says*: "The Spanish word for edible is comestible.")		
Tutor prompts tutee to underline the parts that are the same in Spanish and English (e.g., Comest<u>ible</u> [and] Ed<u>ible</u>)		
Tutor provides 3 examples and nonexamples for guided practice (*Tutor says*: "My mom makes tacos for dinner. Are tacos edible or not edible?")		
Tutor provides praise/feedback for correct responses (*Tutor says*: "Yes! Tacos are edible; we can eat them") or activates error correction procedure for 3 examples (tutor clicks option for tutee's response [e.g., edible or not edible])		
Tutor prompts tutee to draw a quick sketch of a personal example (tutor and tutee)		
Tutor prompts tutee to write a quick sentence using the target word (tutor and tutee [e.g., Sopapillas are edible and I love them!])		
Tutor introduces affixes (*Tutor says*: "Now we are going to learn prefixes that mean "not" or "opposite")		
Tutor provides definition of affix and uses it with new word (e.g., *Tutor says*: "In means *not*; so, *in*edible means not able to eat.")		
Tutor prompts tutee to respond to questions (*Tutor says*: What means not able to eat? [then] *Tutor says*: What does inedible mean?")		
Tutor provides feedback (*Tutor says*: "Yes! Inedible means not able to eat.")		
Tutor provides 2 examples and nonexamples for guided practice (*Tutor says*: "Trashbags; edible or inedible?")		
Tutor provides praise/feedback for correct responses (*Tutor says*: "Trashbags are inedible; we are not able to eat them") or activates error correction procedure for 2 examples (tutor clicks option for tutee's response [e.g., edible or inedible])		
Tutor reviews target words and provides overall feedback for the lesson.		
Fidelity = (#s of Yes / 22) x 100% =		

APPENDIX E: LESSON FORMAT SAMPLE

We are going use words we already know to learn new words that will help us sound smarter and help other people understand us easier.

We what it means to:
make someone believe

When we try to make someone believe, we try to **persuade**

Persuade

Say persuade_____   One more time_____

Persuade means to try and make someone believe what you say.

What does **persuade** mean?_____

Right!

Persuade means to make someone believe what you say.

What word means to make someone believe what you say?_____

Right!

Persuade means to make someone believe what you say.

Highlight **persuade** on your glossary

The Spanish word is:

◀ **persuadir**

Underline the parts that are the same in Spanish and English.

persuadir

persuade

Listen.

A man is telling someone to buy his bike because it has good tires.

Is the man trying to persuade or not persuade?

---

persuade

The man is trying to make someone believe he should buy the tires.

Good Job!

---

persuade

The man is trying to make someone believe he should buy the tires.

Try again.

Try this one.

In the story about Jose who worked on the farm in Mexico, his brother told him he would love to go fishing and asked him to go.

Which **sentence shows that Jose's brother is trying to persuade him**?

...his brother told him he would love to go fishing and asked him to go.

Good Job!

Jose's brother tried to make him believe he would love to go fishing.

Good Job!

Quick Sketch

* Any of the pictures may help us to remember the word persuade. Draw a different picture that can help you remember the word persuade. I will draw a picture too.

* We have one minute to draw a quick sketch.

The same model lead test format would continue for the four other words.

Now we are going to learn prefixes that mean "not" or "opposite".

Try this one.

In the story about Jose who worked on the farm in Mexico, his brother told him he would love to go fishing and asked him to go.

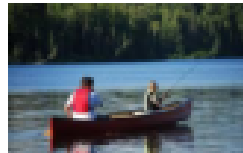Which **sentence shows that Jose's brother is trying to persuade him?**

...his brother told him he would love to go fishing and asked him to go.

Good Job!

Jose's brother tried to make him believe he would love to go fishing.

Good Job!

Quick Sketch

* Any of the pictures may help us to remember the word persuade. Draw a different picture that can help you remember the word persuade. I will draw a picture too.

* We have one minute to draw a quick sketch.

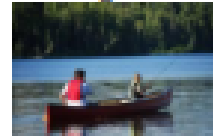*The same model lead test format would continue for the four other words.*

Now we are going to learn prefixes that mean "not" or "opposite".

dis- means <u>not</u>

- So, **disuade** means to try not to make someone believe.

What does **disuade** mean?_____

Right!

disuade means to not try and make someone believe.

What word means to not

try and make someone believe?_____

Right!

disuade

Listen.
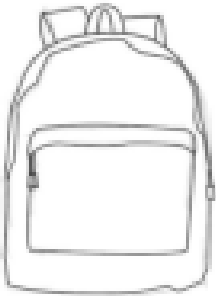
Felipe's parents will try to make him not believe he should drop out of school.

Are **Felipe's** parents trying to persuade or disuade?

APPENDIX F: SAMPLE GRAPHIC ORGANIZER

Graphic Organizer (sample)

Word/Define	Morphographs
Port → carry Portáil → levar	ex- out im- in can -able
Quick-Sketch	Sentence
	This bookbag is portable

APPENDIX G: ACADEMIC VOCABULARY KNOWLEDGE PROBE SAMPLE

If Jose <u>carries</u> his laptop to his bedroom; I know the laptop is:

A. deflected

B. portable

C. deflated

D. predictable

APPENDIX H: TEACHER NOMINATION FORM

The information you provide will remain confidential.

1. Do you have students in your classroom who (a) qualify for special education services, AND (b) are native Spanish speakers and speak Spanish in the home?

    _____ YES   _____ NO

    If you checked **YES**, please continue. You may stop here if you marked NO.

2. Please provide **first name**, most recent **DRA level**, and **EC eligibility** for those students who meet the above criteria.

    Name:_____   DRA level:_____   EC category:_____

    Name:_____   DRA level:_____   EC category: _____

    Name:_____   DRA level:_____   EC category: _____

    Name:_____   DRA level:_____   EC category: _____

    Name:_____   DRA level:_____   EC category:_____

    Name:_____   DRA level:_____   EC category:_____

    Name:_____   DRA level:_____   EC category:_____

    Name:_____   DRA level:_____   EC category:_____

3. If you teach using a specific Reading Curriculum, please specify:

    _____

    _____

    _____

4. What does your typical Language Arts instruction include?

    _____

    _____

    _____

5. How many days per week do these students receive <u>additional</u> Language Arts instruction?
   - How long (min/hr) per day? _____ and, By whom?_____

6. Do you know if these supports use a specific curriculum?

   _____

   _____

   _____

7. In your own words, describe what instruction looks in the classroom that provide additional supports for these students.

   _____

   _____

   _____

8. Please feel free to provide any additional information that may be helpful to know:

   _____

   _____

   _____

Thank you!

APPENDIX I: PARTICIPANT SOCIAL VALIDITY FORM

Consumer Satisfaction Questionnaires: Participant Form

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. I liked the computer vocabulary lessons.	1	2	3	4	5
2. The computer sessions were easy to use.	1	2	3	4	5
3. I liked working with my partner.	1	2	3	4	5
4. When words were in Spanish and 5. English I understood the meanings better.	1	2	3	4	5
6. Learning prefixes and suffixes helped me figure out the meanings of words that I did not know.	1	2	3	4	5
7. I thought it was helpful to learn new words based on my life experiences.	1	2	3	4	5
8. The lessons helped me learn new words.	1	2	3	4	5
9. I feel more comfortable reading harder words because I may already know another word that has the same meaning.	1	2	3	4	5
10. I can understand what I read better because of these computer vocabulary lessons.	1	2	3	4	5

11. What did you like MOST about the lessons?

12. What did you NOT like about the lessons?

13. What was part was MOST helpful?

14. What was NOT helpful?

APPENDIX J: PARENT SOCIAL VALIDITY FORM

Consumer Satisfaction Questionnaires: Parent Form

Question	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. It is important for my child to learn English vocabulary.	1	2	3	4	5
2. It is important for my child to use Spanish to help him/her learn English.	1	2	3	4	5
3. It is important to use aspects of my child's culture in teaching to support my child's learning.	1	2	3	4	5
4. Having students work together to learn English vocabulary is a useful way of learning for my child.	1	2	3	4	5
5. Using computer program is a good way to teach English for my child.	1	2	3	4	5
6. I think my child likes learning from this program.	1	2	3	4	5
7. I think my child improves his/her vocabulary as a result of this program.	1	2	3	4	5
8. I think my child improves his/her reading comprehension as a result of this program.	1	2	3	4	5
9. I would recommend the program to others (parents, teachers) as a way to improve English learning.	1	2	3	4	5

10. What did you like MOST about the lessons?

11. What did you NOT like about the lessons?

12. Please provide any additional comments you would like to share about this program.

APPENDIX K: TEACHER SOCIAL VALIDITY FORM

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. It is important for students who speak English as a second language to acquire grade-level academic vocabulary.	1	2	3	4	5
2. The acquisition of grade-level academic vocabulary will enhance the reading skills of the students in the study.	1	2	3	4	5
3. The use of morphemes (e.g., prefix, suffix, base words) is a good strategy to use to teach vocabulary to students who speak English as a second language.	1	2	3	4	5
4. Using culturally responsive materials and teaching practices are important for this population to learn new vocabulary (for example, use Spanish cognates, examples they can relate with and Latino books).	1	2	3	4	5
5. Peer tutoring is practical for me to use in my classroom.	1	2	3	4	5
6. Computer-assisted, peer-delivered morphograph instruction (as presented in the video) is practical for me to use in my classroom.	1	2	3	4	5
7. I may try computer-assisted peer tutoring to enhance the vocabulary skills of students in my classroom.	1	2	3	4	5
8. I've noticed improvement in the participant's vocabulary skills since their involvement in the intervention.	1	2	3	4	5

Please provide any additional comments that were not addressed in this questionnaire that you would like to share.

APPENDIX L: TEACHER CONSENT

Teacher Consent

The University of North Carolina at Charlotte
Department of Special Education and Child Development
9201 University City Boulevard
Charlotte, NC 28223-0001

Project Title and Purpose
You are invited to participate in a research study. This is a study to examine the effects of peer-delivered computer -assisted instruction on vocabulary acquisition and generalization of fifth-grade Latino students with learning disabilities.

Investigator (s)
This study is being conducted by Adrienne Anderson, Department of Special Education and Child Development, as part of the requirements for a doctoral degree. The responsible faculty member is Dr. Ya-yu Lo, Associate Professor, Department of Special Education and Child Development.

Description of Participation
You will be asked to: (a) identify students who meet the inclusionary criteria by completing a short survey; (b) allow access to educational records of participants for the investigator to verify the students' participation eligibility; and (c) watch a 15-20 min recording of the intervention session to complete a survey (that will take about 10 minutes) indicating your opinions of the intervention.
Six students will be selected to participate in the study. Students will be paired to tutor each other on

vocabulary words. Each tutoring session will take about 30 minutes. The tutoring will take place outside of the students' classroom and will be a time agreed upon by you without interference with core content instruction. The participants will be assessed on vocabulary at the beginning of the study (pretest) and every session afterward. The pretest will take 20 minutes in four sessions across two days. At the end of the study, the students and their parents will also be asked to complete a survey to give their opinion of the program. Some tutoring sessions will be videotaped but the recording will exclude direct footage of the students' face to maintain confidentiality. I will do my best to not interfere with valuable instructional time.

Length of Participation
This project will begin in October 2013 and end March 2014.

Risks and Benefits
There are no known risks to participation in this study. However, there may be risks which are currently
unknown. The students participating in this study will likely benefit from improved vocabulary knowledge and improved reading comprehension.

Volunteer Statement

You are a volunteer. The decision to participate in this study is completely up to you. If you decide to be in the study, you may stop at any time. You will not be treated any differently if you decide not to participate or if you stop once you have started.

Confidentiality
Any information about your participation, including your identity, will be kept confidential. The following steps will be taken to ensure confidentiality:
- Participants will not put their names on survey
- Pseudonyms will be used in all reports
- Participants can end their participation at any time
- Participants can choose not to respond to any question

Only the principal investigator and research staff will have access to the raw data. All gathered data will be stored in a locked cabinet and on a password protected computer, and be destroyed 5 years after the study has ended.

Fair Treatment and Respect
UNC Charlotte wants to make sure that you are treated in a fair and respectful manner. Contact the University's Research Compliance Office (704.687.1871) if you have any questions about how you are treated as a study participant. If you have any questions about the project, please contact Adrienne Anderson (980.328.0106), or Dr. Ya-yu Lo (704.687.8716).

Participation Consent
I have read the information in this consent form. I have had the chance to ask questions about this study, and those questions have been answered to my satisfaction. I am at least 18 years of age, and I agree to participate in this research project. I understand that I will receive a copy of this form after it has been signed by me and the Principal Investigator.

_____
Participant Name (PRINT)

_____   _____
Participant Signature   DATE

_____   _____
Investigator Signature   DATE

APPENDIX M: STUDENT ASSENT

Student Assent

UNCCHARLOTTE

The University of North Carolina at Charlotte
Department of Special Education and Child Development
9201 University City Boulevard
Charlotte, NC 28223-0001

My name is Mrs. Anderson and I am a student at The University of North Carolina at Charlotte. I am doing a
study to see if children can learn English words to help them read better.

If you want to be in my study, I will ask you to work with a partner in vocabulary tutoring sessions on the
computer. You and your partner will take turns being the tutor. During the sessions, you will take turns teaching each other new words. I will video record your sessions so that I can be sure that the both of you are doing everything needed to teach the new words. After each session, you will answer questions about the words you learned in the session. This is not a test and you will not be graded. I will ask you to answer a few questions when the study is over to know what you thought of it. Also, I will be asking you a few questions about yourself so I can make sure I make lessons fun for you.

You can ask questions at any time. You do not have to be in the study. If you start the study, you can stop any time you want and no one will be mad with you.

I hope that this new way of learning words will help you and other students learn to read better, but I can't be sure it will. This study will not hurt you but it could give you good vocabulary skills to use in the future.

When I am done with the study, I will write a report. I will not use your name in the report. Some of the sessions will be videotaped.

If you want to be in the study, please sign your name.

_____
Participant Name (PRINT)

_____   _____
Participant Signature   DATE

_____   _____
Investigator Signature   DATE

APPENDIX N: PARENT CONSENT

Parent Consent

UNCCHARLOTTE

The University of North Carolina at Charlotte
Department of Special Education and Child Development
9201 University City Boulevard
Charlotte, NC 28223-0001

Project Title and Purpose
Your child is invited to participate in a research study that will use a peer-delivered, computer-assisted vocabulary instruction that will address specific books and examples that your child is familiar with. The purpose is to see if students learn more English vocabulary with this type of instruction.

Investigator (s)
This study is being conducted by Adrienne Anderson, Department of Special Education and Child Development, as part of the requirements for a doctoral degree. The responsible faculty member is Dr. Ya-yu Lo, Associate Professor, Department of Special Education and Child Development.

Description of Participation
Your child's teacher has nominated your child as an eligible participant for this study. Your child may or may not be selected to participate in the study if parental consent is granted. If your child is not selected to participate in the study, all information collected for this study about your child will be destroyed immediately after the selection is completed. If your child is selected, your child will be asked to participate in computer-assisted vocabulary tutoring sessions with a student partner to learn important vocabulary words. Each tutoring session will take about 30 minutes. Some tutoring sessions may be videotaped to allow us to collect data. Your child will be assessed on vocabulary at the beginning of the study (pretest) and every day when this study's instruction occurs. The assessments are solely for the purpose of this study and will not be used as a part of the classroom grades your child receives. Your child will not be pulled from core instruction to participate in the study. Before the intervention begins, I will ask you and your child to participate in a survey that will help me make the instruction better for your child. You do not have to answer any questions you do not want. At the end of the study, you and your child will be asked to complete another survey to tell us about your opinion of the program. The survey will take about 10 minutes. Your child's educational record will be reviewed. All data as well as you and your child's participation will be kept confidential. The particular steps to ensure this confidentiality include maintaining all collected data in a locked file cabinet which is only accessible by the investigator and the immediate research staff. Video recording will exclude direct footage of your child's face. All paper data will be shredded and electronic data will be deleted 5 years after the study has ended. Video recording will be edited and may be used in future professional development.

Length of Participation
Your child's participation in this project will begin in October 2013 and end March 2014. If you decide to provide consent for your child to participate, your child will be one of 6 participants in

this study.

Risks and Benefits

There is no risk associated with this study. There may be risks that are currently unknown. The benefits of participation in this study may include improved English vocabulary knowledge and improved reading comprehension for your child.

Volunteer Statement

Your child is a volunteer. The decision to participate in this study is completely up to you and your child. If you decide for your child to be in the study, your child may stop at any time. Your child will not be treated any differently if you and your child decide not to participate, or if your child stops once he or she has started.

Confidentiality

The data collected by the Investigator will be kept confidential. The following steps will be taken to ensure
this confidentiality:

- Participants will not put their names on the pretest or weekly assessment. Instead, pseudonyms will be used.
- Participants can end their participation at any time. Participants can choose not to respond to any question.
- Only the principal investigator and research staff will have access to the raw data. All gathered data will be stored in a locked cabinet and on a password protected computer, and be destroyed 5 years after the study has ended.
- Video recordings will not have direct footage of your child's face.

Fair Treatment and Respect

UNC Charlotte wants to make sure that you are treated in a fair and respectful manner. Contact the University's Research Compliance Office (704-687-1871) if you have any questions about how you are treated as a study participant. If you have any questions about the project, please contact Adrienne Anderson (980.328.0106), or Dr. Ya-yu Lo (704.687.8716). Should you decide at any time that you no longer want your child to be in the video recordings after giving your consent, please contact Dr. Ya-yu Lo in the Department of Special Education and Child Development at UNC Charlotte.

Participation Consent

My child:

      (YES) can participate   (NO) cannot participate

      (YES) can be video recorded   (NO) cannot be video recorded

_____
Participant Name (PRINT)

_____   _____
Participant Signature   DATE

_____   _____
Investigator Signature   DATE

Parent Consent (Spanish)

UNCCHARLOTTE

The University of North Carolina at Charlotte
Department of Special Education and Child Development
9201 University City Boulevard
Charlotte, NC 28223-0001

Efectos de la Enseñanza de Vocabulario Académico en los Estudiantes de Inglés con Dificultades de Aprendizaje la Adquisición y Generalización de Vocabulario

Propósito del Proyecto:
Su hijo está invitado a participar en un estudio de investigación titulado Estrategias Didácticas de Vocabulario para
la adquisición y generalización de palabras en Inglés en los estudiantes Latinos." Este es un estudio para ver qué tipo de instrucción de vocabulario (enseñar de la palabra completa o enseñar parte de la palabra) es más eficaz en la mejora de habilidades del vocabulario de los estudiantes Latinos con discapacidades de aprendizaje.

Investigador
Este estudio es dirigido por Adrienne Anderson, del Department of Special Education and Child Development (Departamento de Educacion Especial and Desarrollo del Niño), como parte de los requerimientos para obtener el título de doctorado. La profesora responsable es Dr. Ya-yu Lo, del Department of Special Education and Child Development (Departamento de Educacion Especial and Desarrollo del Niño).

Descripción of Participación:
El maestro de su niño ha nombrado a su hijo como un participante elegible para este estudio. Su niño puede o no puede ser seleccionado para participar en el estudio si se concede el consentimiento de los padres. Si su hijo no es seleccionado para participar en el estudio, toda la información recopilada para este estudio acerca de su hijo serán destruidos / rallado inmediatamente después de completada la selección. Si su niño es seleccionado, su hijo será invitado a participar en las sesiones de tutoría vocabulario asistida por ordenador con un compañero estudiante de aprender importantes palabras del vocabulario.El vocabulario de su hijo será evaluado al inicio del estudio y después dos veces por semana. La evaluación que se hará al principio tomará 30 minutos cada una durante cuatro sesiones en dos días. Las evaluaciones semanales tomarán alrededor de minutos cada una. Las evaluaciones serán utilizadas únicamente para este estudio y no se utilizaran como parte de las calificaciones en las clases que recibe su hijo. Su hijo no será sacado de instrucción básica para participar en el estudio. Al final del estudio, su hijo tendrá que completar una encuesta para dar su opinión sobre el programa. La encuesta le tomará aproximadamente 30 minutos. El expediente educativo de su hijo será revisado. Los datos recogidos durante las evaluaciones serán mantenidos conocida por los investigadores, así como usted y la participación de su hijo se mantendrá confidencial. Los pasos concretos para garantizar esta confidencialidad incluyen el mantenimiento de todos los datos recogidos en un archivador cerrado al que sólo el investigador y el personal trabajando para el investigador tendrán acceso. La cara de su hijo será excluida de las grabaciones de vídeo. Todos los datos que estén escritos en papel serán triturados y datos electrónicos que estén grabados en la computadora serán borrados 3 años después de haber terminado el estudio. Los vídeos grabados serán editados y pueden ser utilizados en actividades para el desarrollo profesional futuro.

Duración de Participación:
La participación de su hijo en este proyecto comenzará en Octobre del 2013, y terminara a finales de Februaro del 2013. Si usted decide dar su consentimiento para que su hijo participe, su hijo será uno de 8 participantes en este estudio.

Riesgos y Beneficios de la Participación:
No hay riesgo asociado con este estudio. Pueden haber riesgos que son desconocidos actualmente. Los beneficios de la participación en este estudio incluyen la mejora de los conocimientos de vocabulario y la mejora de la comprensión de lectura.

Declaración de Voluntariado:
Su hijo es un voluntario. La decisión de participar en este estudio es totalmente de usted y de su hijo. Si usted decide que su hijo participe en el estudio, su hijo o usted pueden decidir retirarse del estudio en cualquier momento. Su hijo no será tratado de forma diferente si usted y/o su hijo deciden no participar, o si usted o su hijo decide retirarse una vez que él o ella ha comenzado.

Confidencialidad:
Los datos colectados por el investigador serán mantenidos confidencialmente. Los siguientes pasos serán tomados para asegurar la confidencialidad:
- Los participantes no pondrán sus nombres ni en las evaluaciones iniciales ni en las semanales. En vez de usar nombres, se utilizaran números para identificar los datos recogidos.
- Seudónimos se utilizarán en todos los informes
- Los participantes pueden escoger retirarse del estudio en cualquier momento
- Los participantes pueden optar por no responder a ninguna pregunta
- Sólo el investigador principal y el personal de investigación tendrán acceso a los datos. Todos los datos recogidos se almacenaran en un gabinete cerrado protegido con contraseña, y serán destruidos 3 años después de terminar el estudio.
- Las grabaciones de vídeo no tendrán toma directa de la cara de su hijo.

Trato Justo y Respeto:
UNC Charlotte quiere asegurarse de que usted sea tratado de una manera justa y respetuosa. Comuníquese con la Oficina de Cumplimiento de Investigación de la Universidad (704-687-1871) si tiene alguna pregunta acerca de cómo se le trata como un participante del estudio. Si usted tiene alguna pregunta sobre el proyecto, por favor póngase en contacto con Adrienne Anderson (980.328.0106), or Ya-yu Lo (704.687.8716).

Formulario de Permiso
Por favor, marque en una de las casillas de abajo indicando su decisión acerca de la participación de su hijo en este estudio. Si está de acuerdo que su hijo participe debe marcar una de las casillas que indican que usted permite que su hijo sea grabado en video. Por favor devuelva este formulario al maestro de su hijo en el sobre adjunto. Mantenga la carta de arriba para sus registros.]

(Sí) mi hijo puede participar   (NO) mi hijo puede participar

(Sí) mi hijo puede ser grabado en vídeo   (NO) mi hijo puede ser grabado en vídeo

_____
Nombre del Padre/Madre (Escrito)

_____   _____
Firma del Padre/Madre   Fecha

_____   _____
Firma del Investigador   Fecha