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I, Jean F Rivera Perez, hereby submit this original work as part of the requirements for the degree of Doctor of Philosophy in Communication Sciences and Disorders.

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Abstract

Many English language learners (ELL) show a significant vocabulary gap when compared to their monolingual peers. Due to this, many of these children are at risk of not being able to meet academic standards. To ameliorate this vocabulary gap, bilingual instruction has been recommended as an alternative English-only instruction in order to promote second language learning and specifically bilingual vocabulary acquisition (Mancilla-Martinez, & Lesaux, 2011).

Professionals who are fluent in more than one language commonly administer these bilingual interventions. However, the number of bilingual professionals who can provide bilingual instruction to ELL children is limited, and many children miss the benefits of this type of instruction. The purpose of this research is to determine the effectiveness of using the first language (L1), specifically Spanish, with an online text-to-speech computer program used by a monolingual clinician to enhance vocabulary growth in both the L1 and second language (L2) of children who are ELLs.

Forty-three Spanish-speaking preschoolers in English-only-instruction-classrooms were randomly assigned to one of three-conditions addressing vocabulary and definition: (a) Spanish-English intervention (SEI, n=14) using text-to-speech for supplemental translation into Spanish; (b) English-only intervention (EI, n=14); and (c) Control (n=15). In SEI and EI, a monolingual speaker of English provided intervention that taught vocabulary and definition. The clinician in the SEI group used text-to-speech technology (TTS) to deliver translations of the target words and definitions. All children were tested for expressive knowledge of the vocabulary targets and definitions before intervention, after intervention, and six weeks post intervention.
The SEI and EI groups showed significantly greater gains in English naming when compared to the control group. The SEI group showed significantly greater gains in English definitions when compared to the control group. The SEI group showed significantly greater gains in Spanish naming and definition when compared to the EI and control group. The results support the use of Spanish/English intervention to promote the acquisition of Spanish expressive vocabulary and definitions in Spanish and English. TTS was found to be a useful method to support mono English SLPs in providing this intervention.

In this project we also addressed shyness in ELLs. ELLs who are shy have demonstrated lower L2 competency as well as slower L1 development when compared with their non-shy peers (Keller et al., 2013). However, the impact of shyness on vocabulary gains during vocabulary intervention is a topic less reported in the literature. This research examined the relationship between scores on the Assertive Social Skills and Shyness/Anxiety rating scale of the Teacher Child Rating Scale 2.1 (T-CRS 2.1), and gains in naming vocabulary following English-only intervention (EI, n=14) or Spanish-English intervention (SEI, n=14) for ELLs. Our results indicated that Assertive Social Skills and Shyness/Anxiety rating scale percentiles predicted English vocabulary gains in both the EI and SEI groups and Spanish vocabulary gains in the SEI group for naming and definition. Children who achieved lower percentile scores on the Assertive Social Skills and Shyness/Anxiety rating scale (reflecting greater shyness) learned fewer new words than children who demonstrate high levels in social assertiveness. ELLs may benefit from additional support to overcome shyness to facilitate vocabulary acquisition during intervention.

*Keywords:* Bilingual intervention, expressive vocabulary, English language learners, computer assisted learning, text to speech, shyness, silent period.
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"If I have seen further, it is by standing on the shoulders of giants."–Sir Isaac Newton

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# Table of Contents

Abstract ........................................................................................................................................... 3

Acknowledgements ............................................................................................................................ 5

List of Tables ..................................................................................................................................... 11

Chapter I Literature Review ............................................................................................................. 13

  Background ................................................................................................................................... 15

  Vocabulary Gap .............................................................................................................................. 16

  Advantages of Maintaining L1 ........................................................................................................ 20

  Theoretical Models of Bilingual Acquisition ............................................................................... 22

  Issues Surrounding Language of Intervention/Instruction ......................................................... 24

  Vocabulary Strategies for ELLs ...................................................................................................... 32

  Promoting Vocabulary with Text-To Speech (TTS) .................................................................... 35

  Shyness and Vocabulary Intervention ....................................................................................... 38

  Shyness and Language Development in ELLs .............................................................................. 40

  Strategies to Help Children Overcome Shyness ........................................................................ 45

  Summary and Conclusions ........................................................................................................... 46

Chapter II The Use of Text-To-Speech to Teach Vocabulary to English Language Learners. .... 48

  Vocabulary Development in ELLs ............................................................................................... 49

  Issues Surrounding Language of Intervention/Instruction ......................................................... 51

  Vocabulary Strategies for ELLs .................................................................................................... 53

  Methods ....................................................................................................................................... 56

  Participants ................................................................................................................................... 56

  Procedure ..................................................................................................................................... 58
THE USE OF TEXT-TO-SPEECH TO TEACH VOCABULARY

Participants .................................................................................................................................................................................. 97

Procedures ..................................................................................................................................................................................................................... 98

Selection of Target Words ........................................................................................................................................................................... 99

Testing of Target Words .................................................................................................................................................................................................... 99

Shyness Measure ........................................................................................................................................................................................................ 100

Intervention ....................................................................................................................................................................................................... 101

Fidelity and Reliability .................................................................................................................................................................................. 103

Results .............................................................................................................................................................................................................. 104

Relationship Between Assertive Social Skills and Shyness/Anxiety Rating Scale, and English Naming Gains for the English-only Intervention Group .......................................................... 104

Relationship Between Assertive Social Skills and Shyness/Anxiety Rating scale, and English Definition Gains for the English-only Intervention Group ........................................................................ 105

Relationship Between Assertive Social Skills and Shyness/Anxiety Rating scale, and English Naming Gains for the Spanish-English Intervention Group ........................................................................ 106

Relationship Between Assertive Social Skills and Shyness/Anxiety Rating scale, and English Definition Gains for the Spanish-English Intervention Group ........................................................................ 107

Relationship Between Assertive Social Skills and Shyness/Anxiety Rating scale, and Spanish Naming Gains for the Spanish-English Intervention Group ........................................................................ 108

Relationship Between Assertive Social Skills and Shyness/Anxiety Rating scale, and Spanish Definition Gains for the Spanish-English Intervention Group ........................................................................ 109

Discussion ..................................................................................................................................................................................................... 110

Shyness/Anxiety and Vocabulary Learning .......................................................................................................................................................................................... 111

Limitation and Future Directions ........................................................................................................................................................................ 113
## List of Tables

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Distribution of children by classroom and intervention group.</td>
<td>78</td>
</tr>
<tr>
<td>2</td>
<td>Family Characteristics and Language Spoken at Home (First Article)</td>
<td>79</td>
</tr>
<tr>
<td>3</td>
<td>Parents’ Report of Language(s) Used and Child’s Language Proficiency at Home (First Article)</td>
<td>80</td>
</tr>
<tr>
<td>4</td>
<td>Pretest, Posttest, and Follow Up Mean Scores and Standard Deviations for English and Spanish Vocabulary Naming and English and Spanish Definitions for the Spanish-English Intervention, English-Only Intervention, and Control Groups (First Article)</td>
<td>81</td>
</tr>
<tr>
<td>5</td>
<td>Distribution of children by classroom and intervention group.</td>
<td>117</td>
</tr>
<tr>
<td>6</td>
<td>Family characteristics and language spoken at home (Second Article)</td>
<td>118</td>
</tr>
<tr>
<td>7</td>
<td>Parents’ Report of Language(s) Used and Child’s Language Proficiency at Home (Second Article)</td>
<td>119</td>
</tr>
</tbody>
</table>
Chapter I

Overarching Literature Review

This chapter provides a literature review for two research projects: “The Use of Text-To-Speech to Teach Vocabulary to English Language Learners” and “Assertiveness and Shyness as Predictors of Vocabulary Intervention Outcomes for English Language Learners”. More specifically, this chapter includes a review of the relevant literature for the two research projects, addressing the research questions, significance of the projects, and theoretical background in which these research projects are situated. Review of these issues provides a structured framework for undertaking each of the projects.

Background

Individuals learning English as a second language (L2) while continuing to develop their first language (L1) at home are known as English Language Learners or ELLs (Flores, 2016). Of the 11.2 million school-aged ELLs in the United States, 2.7 million have limited English proficiency (Aud et al., 2011). Hispanics or Latinos are the largest minority group in United States, comprised of approximately 50 millions of people. A vast majority of this group speaks Spanish as their first language (Passel, Cohn, & Lopez, 2011). Over the next decade it is anticipated that the Hispanic American population in the U.S. will double in size (Colby & Ortman, 2015). Due to the importance of English proficiency for academic success, ELLs are at risk of not being able to meet the academic demands required to succeed in school. In order to support the communication needs of this growing population new instructional approaches that include the home and school languages are necessary.

Many ELLs begin kindergarten lagging behind their peers in the areas of language and literacy development. Unfortunately, statistics indicate that ELLs continue to struggle throughout
their academic careers performing below their peers in reading in Grades 4 and 8 (Aud et al., 2011). ELLs underperform in all content areas and show higher rates of school dropout (Aud et al., 2011; Hernandez, 2011). ELLs face a higher risk for academic failure when they have limited English proficiency and many come from socioeconomically disadvantaged homes (Kieffer, 2008). As the number of ELLs in the United States continues to increase, national attention has focused on promoting the academic success of this group through the development of intervention programs targeting early language and literacy skills, particularly in preschoolers. Because ELLs frequently communicate in two languages, clinicians and educators need to find ways to support both, the language of the mainstream classroom and the language at home.

While various language and literacy skills are critical to the academic success of ELLs, vocabulary has been consistently identified as essential for the development of reading competency and proficiency (Lee, 2011; Parra, Hoff, & Core, 2011). As such, educators have examined the effectiveness of approaches for teaching vocabulary to ELLs. Research comparing vocabulary instruction for children who speak two languages supports teaching both L1 and L2 vocabulary to increase word learning in both languages. This approach has been shown to result in greater vocabulary acquisition in both L1 and L2 (Lugo-Neris, Jackson, Goldstein, 2010; Méndez, Crais, Castro, & Kainz, 2015; Restrepo, Morgan & Thompson, 2013). The nature of this recommended instruction requires the educator to be bilingual. However, this can create a challenge as many educators, including speech language pathologists (SLPs), do not possess this capability.

It is the position of the American-Speech-Language-Hearing Association (ASHA) that SLPs play a critical role in the design and execution of interventions for ELLs. Due to their extensive training in L1 and L2 acquisition, culturally-responsive assessment methods and
intervention techniques, and competencies for working with families and other professionals, SLPs possess the qualifications necessary to provide English language instruction for ELLs (ASHA, 1998). Despite the fact that SLPs have the essential knowledge and skills to work with ELLs, many SLPs employed in the United States are monolingual English-speakers and lack the ability to deliver intervention services in Spanish. A demographic profile of ASHA members in 2015 revealed that only 6,594 SLPs identified themselves as Spanish-English bilingual, with a high concentration of bilingual members in Texas, New York, California, and Florida (ASHA, 2016). The dearth of bilingual SLPs to serve children in the United States who need L1 or both L1 and L2 instruction has created a significant problem. New evidence-based strategies to support monolingual SLPs in the delivery of vocabulary interventions are essential to ensure Spanish-speaking ELLs can achieve academic success.

**Importance of Vocabulary for ELL Instruction**

Vocabulary is an essential component of comprehension, speaking, reading, and writing. The National Reading Panel (National Institute of Child Health and Human Development [NICHHD], 2000) has argued that vocabulary is one of the most important components of reading success. This means that for children to succeed in school they need to demonstrate adequate vocabulary acquisition in order to be effective readers and meet the academic standards. Vocabulary knowledge plays an essential role in reading development in two ways: the identification of words (decoding words and recognition) and the process of understanding a written message (Adlof & Perfetti, 2014). Research suggests that vocabulary is positively associated with the development of early accuracy in reading words (Nation & Cocksey, 2009) and later reading comprehension (Duff, Reen, Plunkett, & Nation, 2015; Elleman, Lindo, Morphy, & Compton, 2009; Lee, 2011).
Research regarding ELLs indicates that the level of vocabulary knowledge in L2 (English) is related to L2 reading comprehension (Proctor, Carlo, August, & Snow, 2005). Furthermore, vocabulary knowledge in L1 (Spanish), is also positively associated with reading comprehension and fluency in L2 (English; Proctor, Carlo, August & Snow, 2006). Proctor and colleagues (2006) are able to demonstrate this point by measuring English and Spanish alphabetic knowledge of 135 Spanish-English bilingual fourth graders using computer-administered tests of pseudo-word recognition. In this investigation, reading comprehension was measured in both languages with the English Woodcock Word Attack subtest (Woodcock, 1991), and the Woodcock–Muñoz Spanish Word Attack measure (Woodcock & Muñoz-Sandoval, 1995). When controlling for factors such as language of instruction, English decoding, and English oral language proficiency, Spanish L1 vocabulary was a significant factor that impacted English L2 reading comprehension and fluency. The authors argue that their data indicates that literacy skills can be transferred to both languages, suggesting that ELL children might transfer certain skills across languages (Proctor et al., 2006). Because vocabulary knowledge in L1 is important for reading comprehension and fluency in English L2, it is important to support both L1 and L2 in ELLs.

**Vocabulary Gap**

Educational policy including No Child Left Behind ([NCLB], 2001) prioritizes the role of literacy instruction to ensure that every child can read by third grade. Because vocabulary is so important for the expansion of literacy skills, NCLB promotes research to ascertain effective ways to teach and support English vocabulary development in the classroom. However, this legislation also creates a dichotomy for teachers and clinicians. ELLs face deficits in English vocabulary knowledge needed to succeed in school. As such, educators must improve vocabulary
development in an environment that makes it difficult to determine what works to achieve this goal (Páez, Tabors, & Lopez, 2007; Umbel, Pearson, Fernandez, & Oller, 1992).

A significant vocabulary gap between ELLs and their monolingual peers has been reported in the literature (Mancilla-Martinez & Lesaux, 2011; Páez, Tabors, & Lopez, 2007; Umbel, Pearson, Fernandez, & Oller, 1992). This gap is characterized by a disparity in English vocabulary and literacy skills that markedly impacts the success of ELLs in the classroom. This has led to an increase in research to address the gap in children who are at risk. For example, Páez Tabors, and Lopez (2007) illuminate the scope of this problem by comparing vocabulary acquisition of 319 preschool ELLs (Spanish-English speakers) in Massachusetts and Maryland with 144 monolingual Spanish-speaking preschoolers in Puerto Rico. Bilingual children were educated in classrooms where English was the dominant language. The children’s language skills were assessed at the beginning and end of the academic year. Bilingual children received Spanish and English versions of the same standardized language test while monolingual Spanish speakers were assessed only in Spanish. Normative tests evaluating early literacy and spoken language were utilized along with picture naming to assess expressive vocabulary. ELLs performed two standard deviations below the national mean in English vocabulary. When the mean Spanish vocabulary of bilingual children was compared to the mean of monolingual Spanish speaking children, ELLs performed below the monolingual Spanish speaking children at both the beginning and end of the academic year (Páez Tabors, & Lopez, 2007).

The gap between ELL vocabulary skills and the vocabulary demands of school may be partially explained by environmental factors such as quantity and quality of parent-child interactions, parent’s socioeconomic status, and parent’s education level (Biemiller & Slonim, 2001; Capps, et al., 2005; Rowe, Jacobson, & Van den Oord, 1999; Shneidman, Buresh, Shimpi,
Knight-Schwarz, & Woodward, 2009). While these variables may account for some of the variance in vocabulary performance, research indicates that there are additional factors that may be responsible for this gap. In particular, scholars have reported that ELLs typically distribute their vocabulary across two or more languages depending on exposure to and use of each language (Oller, Pearson, & Cabo-Lewis, 2007). Because vocabulary is distributed across two languages, vocabulary growth in one language may occur more slowly (Hammer et al., 2014). This may result in a smaller vocabulary in each language (Conboy & Thal, 2006); however researchers have suggested that vocabulary size of ELLs may be comparable to monolinguals when vocabulary in both languages is taken into account (Lundén & Silvén, 2011).

Unfortunately, research indicates that the English vocabulary gap persists even after years of English-only education (Mancilla-Martinez & Lesaux, 2010). Limited vocabulary knowledge in the child’s L2, when that language is the mainstream language, can have a detrimental effect on the child’s communication needs, ultimately leading to academic failure. New methods of instructional support are needed to promote vocabulary acquisition and L2 proficiency in ELLs.

Even though vocabulary plays an important role in the adequate development of children’s language, ELLs consistently demonstrate vocabulary and language skills that lag behind their monolingual peers in both languages. Vocabulary interventions in English-only instruction have not been effective for ameliorating this disparity. For example, Marulis and Neuman (2010) conducted a meta-analysis investigating the effectiveness of vocabulary intervention in monolingual and bilingual children from birth to six years of age. The meta-analysis included 67 studies of vocabulary intervention with the results indicating a strong effect size of 1.21 when measuring the gains of children in target vocabulary after intervention. In contrast an effect size of .71 was seen after vocabulary instruction when standardized
(normalized) tests were used to measure general vocabulary gains rather than only the words that were taught. Children from middle and upper income homes benefited more from the vocabulary intervention than children from low income homes. The authors concluded that vocabulary interventions do not necessarily close the vocabulary gap, especially for children from low income homes (Marulis & Neuman, 2010). New strategies to support vocabulary acquisition are needed to help ELLs to close the gap in both languages and minimize the loss of L1. Models and approaches that incorporate vocabulary to support both L1 and L2 may help children to close the gap while supporting the acquisition of L1.

Vocabulary plays an important role in the adequate development of children’s language. However, ELLs have been reported as having vocabulary and language skills behind their monolingual peers in both languages. Vocabulary interventions in English-only have not been effective to close the gap for children at risk. For example, Marulis & Neuman (2010) conducted a meta-analysis investigating the effectiveness of vocabulary interventions in monolingual and bilingual children from birth to 6 years-old. The meta-analysis included 67 research studies of vocabulary intervention and the results indicated a strong effect size of 1.21 when measuring the gains of children in target vocabulary after intervention. In contrast an effect size of .71 was seen after vocabulary instruction when standardized (normalized) tests were used to measure general vocabulary gains rather than only the words that were taught. Children with middle and upper SES benefited more from the vocabulary instruction than children with low SES or with lower SES. The authors concluded that vocabulary interventions do not necessarily close the vocabulary gap, in particular between children that come from homes with low socio-economic status (SES) and those children that come from homes with middle and upper SES. New strategies to support vocabulary acquisitions are needed to help ELLs to close the gap in both
languages and minimize the loss of the L1. Models and approaches that incorporate vocabulary to support both L1 and L2 may help children to close the gap while supporting the acquisition of the L1.

**Advantages of Maintaining L1**

An emerging issue of concern for the instruction of ELLs is whether a clinician should use L1 during intervention. There are many advantages of retaining L1. Literature suggests that bilingualism confers significant benefits that range from cognitive and educational advantages to socioeconomic and socio-emotional advantages (Adesope, Lavin, Thompson, & Ungerleider, 2010; Bialystok, Majumder, & Martin, 2003; Carlson & Meltzoff, 2008; Grin, Sfreddo, & Vaillancourt, 2010; Prior & MacWhinney, 2010; Zelasko & Atunez, 2000). Understanding these benefits further supports the need to maintain L1 and create instructional supports that integrate L1 and L2.

**Cognitive advantages.** The cognitive advantages of bilingualism are an important focus for supporting this type of language development for ELLs. Adesope and colleagues (2010) analyzed 63 studies of bilingualism to determine factors correlating bilingualism and cognition. The analysis involved 6,022 participants and analyzed areas of cognition that included attentional control, working memory, metalinguistic awareness, metacognitive awareness, abstract symbolic reasoning, creative and divergent thinking, and problem solving. Subjects in these studies had similar levels of proficiency in both languages. A control group of monolingual speakers was used for comparison to measure one or more of the specific outcomes. Positive, significant effects were observed where bilinguals outperformed monolinguals in specific areas including: metalinguistic and metacognitive awareness skills, abstract and symbolic representation, attentional control, and problem solving (Adesope et al., 2010).
Additionally, scholars have found a correlation between bilingualism and a delay in the aging process of the brain as well as a delay in onset of dementia (Bialystok, 2011; Bialystok, Craik, & Luk, 2012).

**Educational advantages.** The educational advantages of bilingualism have been shown to be quite systemic and profound for the individual. In particular, Grosjean (2011) argues that individuals who are multilingual are often more adept at understanding other cultural views of the world. Benefits of bilinguals includes how the individual views the world, facilitating the ability to make critical connections to foster learning. Language and culture are so integrally intertwined that multilingual capabilities may expand the ability of the individual to understand more complex and interconnected phenomenon (Grosjean, 2011). Research also suggests that bilingual children may be more capable when compared with their monolingual peers in mastering word problems in mathematics (Prior & MacWhinney, 2010).

**Socioeconomic benefits.** Socioeconomic benefits for bilingualism have also been reported in the literature. In particular, Agirdag (2013) investigated the long-term effects of bilingualism on immigrant students in the United States. The researcher analyzed data from the National Education Longitudinal Study (NELS) from 1988 to 2000 and from the National Center for Educational Statistics and the Children of Immigrant Longitudinal Study from 1991 to 2003. Children were divided by the language proficiency in each language: limited bilingual, balanced bilingual, and English dominant. Approximately 29,000 participants were monitored from eighth grade to 26-years-of-age with a focus on employment status and income. After controlling for educational status, cognitive abilities, and socioeconomic status (SES), the balanced bilingual group was found to have annual earnings of about $2,000 to $3,200 more than the English dominant group. Additionally, Grin, Sfreddo, and Vaillancourt (2010) investigated
THE USE OF TEXT-TO-SPEECH TO TEACH VOCABULARY

the positive consequences of multilingualism in Switzerland. Findings from this research suggest that multilingualism was positively correlated with personal income, productivity, and gross domestic product (Grin et al., 2010).

**Socio-emotional benefits.** A cursory overview of the literature regarding the socio-emotional benefits of bilingualism indicates that preservation of L1 helps to maintain emotional links through communication with the family members that speak L1. It has been reported that parents cannot effectively communicate with their children if they do not share a common language (Anderson, 1999a; Anderson, 1999b). When children lose their native language, parents may find it difficult to communicate making it difficult to convey values, experiences, beliefs, and advice (Fillmore, 1991). Over time this can have a negative effect on the family leading to dysfunction in the absence of intimacy and the ability to transmit and share beliefs and values. (Fillmore, 1991).

**Theoretical Models of Bilingual Acquisition**

Lexical and vocabulary acquisition can be more complicated when children are learning two languages (Patterson & Pearson, 2012). Principal models of language acquisition that are pertinent to this research are discussed in this section including the Interdependence Model (Cummins, 1984), the Word Association Model, the Concept Mediation Model (Potter, So, Von Eckardt, & Feldman, 1984), and the Revised Hierarchical Model or RHM (Kroll & Stewart, 1994). Examination of these models is required to provide understanding of how bilingual acquisition occurs supporting the need for L1 and L2 instruction in the classroom.

The Interdependence Model proposed by Cummins (1984) suggests that the bilingual lexical systems in children who are learning two languages are interdependent. This model
proposes that the knowledge of one language facilitates the acquisition of the other language. In other words, acquisition of the L1 is influenced by knowledge of the L2. In this model languages interact with each other. Evidence to support this model can be found in studies of French-English interactions in Canada (e.g. Saub & Wesche, 1975) and Spanish-English in the U.S. (e.g. Lugo-Neris et al., 2010). Researchers investigating the interdependence of several aspects of language and literacy have described the relationship as occurring across languages (Lugo-Neris et al., 2010).

Theories of cross-language transfer have evolved over time. Three well known theories of vocabulary acquisition are the Word Association Model, the Concept Mediation Model (Potter et al., 1984), and the Revised Hierarchical Model (Kroll & Stewart, 1994). The RHM merges the other two aforementioned models of lexical organization and attempts to explain the interaction of lexical access based on the bilingual’s previous L1 and L2 experience (Kroll, Van Hell, Tokowicz, & Green, 2010). This model suggests that a bilingual possesses one conceptual representation that is shared in two languages and that rests on the phonological and lexical system of the L1 and L2. In the Word Association Model children begin to learn L2 through the concepts they know in L1. This model primarily explains learning in sequential bilinguals who learn L1 first and then are exposed to L2. Once language becomes formalized the Word Association Model takes over. The Word Association model describes how children are able to make links between the two lexicons and concepts without the mediation of L1. Children link concepts of each language to the same representation. Both models also occur in children who are simultaneous bilinguals (Kroll et al., 2010).

Bedore, Peña, and Boerger (2010) explain four vocabulary representations in cross-language interactions that incorporate RHM. When first using the Concept Mediation Model,
children have strong word knowledge in L1 and low lexical overlapping as they begin to acquire L2. Learning L2 vocabulary relies on children’s phonological skills to learn patterns and meaning in that language. At this stage, children make mistakes in accessing their phonological representation of the other language. This can happen receptively (i.e. confusing the terms: her/heard) or expressively (using the word “bark” for the concept of “boat” using the Spanish structure of the word “barco”). Gradually children increase vocabulary in both languages with some lexical overlapping (Bedore et al., 2010).

**Issues Surrounding Language of Intervention/Instruction**

The language used for teaching vocabulary in school plays an important role in the vocabulary development of ELLs (Simón-Cereijido, Gutiérrez-Clellen, & Sweet, 2013). Researchers have evaluated the effect of the language of instruction/intervention to understand the approach that best supports vocabulary development in this group (Simón-Cereijido et al., 2013). Two main approaches are compared here and include: monolingual instruction (L2-only) and bilingual instruction (L1 and L2).

**Monolingual instruction.** The use of an L2-only model is supported by the premise that the more a child is exposed to a language the more proficient the child will become in that language (Hammer, Lawrence, & Miccio, 2008; Hoff et al., 2012; Pearson, Fernandez, Lewedeg, & Oller, 1997). Marchman and Martínez-Sussmann (2002, 2004) studied 113 two-year-olds exposed to Spanish and English from birth, investigating the relationship between vocabulary and grammar development. Parents reported children’s Spanish and English vocabulary using reports of standardized (normalized) vocabulary in English: the MacArthur Communicative Development Inventory (CDI; Ferson, 1993) and a standardized vocabulary test in Spanish, El Inventario del Desarrollo de Habilidades Comunicativas: Palabras y Enunciados (IDHC;
Jackson-Maldonado, Thal, Marchman, Newton, Fenson, & Conboy, 2003). Correlation was found between children’s vocabulary size and grammar complexity in English and Spanish and the proportion of that language used at home. Similarly, Hammer, Lawrence, and Miccio (2008) examined receptive vocabulary of ELLs as a result of the exposure to Spanish and English. Preschoolers from Spanish-speaking homes showed an increase in English and a decrease in Spanish receptive vocabulary after exposure to more English instruction and less contact with their native Spanish language.

The use of L2-only instruction has been questioned based on two main concerns. The first concern is that L2-only models have failed to close the English vocabulary gap when children participate in L2-only instruction at school. The second concern is that L2-only instructional methods jeopardize the maintenance and growth of L1. Mancilla-Martinez and Lesaux (2011) followed Spanish-speaking ELL’s beginning at age four through 11-years-of-age to determine their spoken language and reading abilities at six time points. Expressive vocabulary skills of ELLs were examined using Spanish and English versions of the same standardized language test. ELLs who received English-only instruction, performed below the national monolingual norm on the expressive vocabulary tests in English and Spanish across all six evaluations (Mancilla-Martinez & Lesaux, 2011).

Because English-only instruction can jeopardize the maintenance and growth of L1, loss of L1 can create problems in family communication, family dynamics, cultural identity, and emotional well-being (Anderson, 2012; Barnett, Yarosz, Thomas, Jung, & Blanco, 2007; Restrepo et al., 1993). Fillmore (1991) interviewed 690 families, including 311 families that spoke Spanish, in a national survey of minority language use in the United States. Analysis of data from these interviews demonstrated that immigrant children in the United States began to
lose their native language once they came in contact with English. Parents presented concerns about native language loss in their children. Specifically, parents reported that communication with their children started to deteriorate at home, with some acknowledging conflicts with their children. Language loss was found principally in those children who participated in English-only education, regardless of the family’s English language proficiency (Fillmore, 1991).

Anderson (2012) reported factors leading to L1 loss in ELLs. Specifically, this author argued that L1 loss occurs as a result of a lack of exposure and use to maintain the L1 language in the community. The status of a language in the community thus influences L1 loss. For example, the more prominence a language has in a population the more it is used, decreasing the potential for losing the language (Anderson, 2012). Another factor contributing to loss of the first language is the disparity between L1 and L2 use. If children speak L1 only at home and L2 at school and in the community, they will have more opportunities to learn new concepts in the L2 rather than in the L1. Language loss occurs due to various factors that have the same common characteristic: a decrease of input and output in diverse scenarios. Anderson (2012) also reports that gender, early immersion in English-only programs, low parent education and SES, poor contact with peers who speak the L1, prestige status of the L1 versus L2, limited contact with the L1 outside of the home, bilingual parents, and a small bilingual community are important factors influencing language loss.

Lexical development is particularly vulnerable when language loss occurs. Anderson (1999a), in a two-year longitudinal study, followed a four-year-old to examine the impact of L1 loss on grammar. The child participated in English-only instruction and Spanish was spoken at home. Parent-child interactions were video recorded every one to two months during a 22 month period. Mean length of utterance and mean of length response were analyzed to determine
morphological complexity. In addition, Spanish vocabulary was sampled to analyze the number of Spanish words in the child’s vocabulary across time. The findings indicate the presence of Spanish attrition, particularly in morphologic and syntactic complexity, as well as a significant decline in the production of noun phrases and verbs (Anderson, 1999a). With this in mind, it may be important to use nouns and verbs in bilingual interventions that target maintenance and acquisition of vocabulary in L1.

In addition, Anderson (1999b) studied two siblings from Puerto Rico beginning when they were four and seven-years-of-age. The children participated in English-only instruction and Spanish was spoken at home. Parent-child interactions in Spanish at home were video recorded for 22 months. Mean length of utterance, use of Spanish nouns, and grammatical gender agreement (grammatical gender) errors in Spanish were analyzed. Results showed that the older sibling who had mastered gender agreement experienced an increase in gender agreement errors in Spanish at the end of the study. This research also demonstrated a negative correlation in the number of nouns used, suggesting that the loss of vocabulary in Spanish occurs over time (Anderson, 1999b).

Losing L1 threatens the communication of ELLs at home when L1 is minimally supported at school. SLPs are responsible to deliver culturally and linguistically appropriate services to ELLs (ASHA, 2007). These services include supporting language and literacy skills and preventing communication risk factors such as language loss. Recommended practices from three associations—the American Speech-Language-Hearing Association (ASHA), the Canadian Association of Speech-Language Pathologists and Audiologists (CASLPA), and the International Association of Logopedics and Phoniatrics (IALP)—were studied by Thordardottir (2010). As reported by this author, the recommendations made by each organization indicate different views
regarding the specific interventions that should be used for the instruction of ELLs. The CASLPA and IALP positions related to language of intervention recommended the use of both languages during intervention, which is supported by research Thordardottir (2010). CASLPA recommends the use of L1 with the aid of a bilingual, bicultural collaborator. IALP recommends bilingual interventions for every bilingual child to support both languages. In contrast, the ASHA recommends the use of English when the clinician considers it appropriate, without the mention of bilingual intervention. However, Thordardottir (2010) does report that the ASHA provided this recommendation in light of the small number of bilingual SLPs in relation to the large number of ELLs currently residing in the United States.

Recommendations for SLPs to include L1 during intervention have increased in recent years (Kohnert & Derr, 2012; Kohnet et al., 2005; Thordadottir, 2010; Gutierrez-Chellen, 1999). Anderson (2012) asserts that when parents want to maintain L1, it is important to make every effort to preserve the home language to facilitate interaction and communication between family members and the child. The benefits of bilingualism have been well established, yet monolingual practices continue to be utilized placing a socio-emotional and academic burden on children and families (Kohnert et al., 2005). In support of the importance of L1 acquisition Kohnert et al., (2005) stated:

“… it is crucial that SLPs and early childhood educators go beyond simply encouraging continued use of the home language by families of young children with LI to actively promote its development. Facilitating, rather than just maintaining, skills in the home language should be a fundamental objective of intervention programs with preschool-age children with LI.” (p. 254).

When only L2 is used for instruction, the child may not be able to access their language strengths
in L1 and may experience a decrease in spoken language, vocabulary growth, literacy skills, and language learning in both L1 and L2. Further, use of L2-only for instruction may make it more difficult for ELLs to learn classroom scripts (Combs, Evans, Fletcher, Parra, & Jiménez, 2005; Guiberson, Barrett, Jancosek, & Itano, 1991; Hamilton et al., 2010; Reyes, 2012; Simon-Cereijido, Gutierrez-Clellen, & Sweet, 2010).

Bilingual instruction. Historically, bilingual approaches were thought to have a negative impact on ELL’s language development with many arguing that bilingualism was responsible for poor academic performance in this group (Baker & Jones, 1999). However, recent literature suggests that bilingual interventions may actually increase a child’s linguistic resources in both languages. Studies that compared language of instruction/intervention (English-only compared to English and Spanish) have found no significant differences in English vocabulary gains suggesting that bilingual instruction does not harm L2 development (Barnett, et al., 2007; Durán, Roseth, & Hoffman, 2010; Lugo-Neris et al., 2010; Méndez et al., 2015; Restrepo et al., 2013).

Barnett, et al (2007) compared the outcomes of bilingual (Spanish-English) and monolingual (English) education in a preschool program. Children were randomly selected to participate in two groups: a Spanish/English immersion group (n = 47) and English-only instruction (n = 28). Receptive vocabulary skills in English and Spanish were assessed with the Peabody Picture Vocabulary Test (PPVT–III; Dunn & Dunn, 1997) and Test de Vocabulario en Imagenes Peabody (TVIP; Dunn, Lugo, Padilla, & Dunn, 1986). The group that received Spanish and English rotated between these two languages every week over 200 days. All participants were from homes where Spanish and English were used. The groups were compared in terms of language growth, emergent literacy, and mathematics. Barnett and coworkers found that children in both groups made gains in English language, mathematics, and literacy. No
significance differences were found between the groups with regard to English language skills or vocabulary. However, the group of children assigned to the dual language condition showed more gains in Spanish when compared to the English only group. Greater gains were found for vocabulary in Spanish for the group that received Spanish vocabulary with an effect size of .61 (Barnett et al., 2007).

In a similar vein of inquiry, Durán, Roseth, and Hoffman (2010) evaluated the effect of English-only instruction and bilingual instruction (English and Spanish instruction). Thirty-one Spanish speaking preschoolers were assigned to one of two conditions: transitional bilingual instruction or English-only instruction. Children were assessed in the following areas: receptive and expressive vocabulary, letter-word identification, alliteration, and rhyming. Assessments were made before and after the academic year and included the Picture Vocabulary Test-4 (PPVT-4; Dunn & Dunn, 2007), Test de Vocabulario en Imágenes Peabody (TVIP; Dunn, Lugo, Padilla, & Dunn, 1997), and the Woodcock-Muñoz Language Survey-Revised (WMLS-S; Alvarado, Ruef, & Schrank, 2005). The group that received instruction in Spanish and English gained significantly more vocabulary in Spanish than the group that received English-only instruction. Further, there were no significant differences in English word learning in both groups (Durán et al., 2010). These studies indicate that there was no decline in English vocabulary gains when comparing English-only and bilingual instruction/intervention. Bilingual interventions have been found to not only increase vocabulary in English as effectively as English-only interventions, but also to provide significant gains in Spanish vocabulary.

Some researchers have suggested that teaching vocabulary with the bilingual approach may facilitate the acquisition of vocabulary in L2. Lugo-Neris and coworkers (2010) examined the use of Spanish L1 bridging in a storybook reading intervention to increase English L2
naming vocabulary and definition. Twenty-two ELL preschoolers were randomly assigned to two conditions: English storybook vocabulary intervention or English storybook intervention with supplemental Spanish. ELLs’ naming and defining targets in English were measured with a researcher-developed test utilized before and after instruction. The interventions consisted of storybook reading for 15-20 minutes a day, three times a week during four weeks of intervention. Researcher-created tests of English examined naming, definition, and identification. More precisely, children were asked to distinguish the target word from three foil pictures of targets before and after the intervention. ELLs who participated in the group that received supplemental Spanish demonstrated significant growth in English naming, English receptive vocabulary, and expressive vocabulary when compared to the group that received English instruction only (Lugo-Neris et al., 2010).

Similarly, Méndez et al. (2015) examined the acquisition of receptive vocabulary by ELLs as a result of the language of vocabulary instruction. Forty-two ELL preschoolers were randomly assigned to one of two conditions: instruction in English-only or Spanish and English instruction. The intervention consisted of storybook reading, word explanation, repeated exposure, and multimodal presentation, in a culturally relevant context. Children were pulled from the classroom in small groups of three to four children to receive instruction. The intervention took place over five weeks, using the same book three times a week for 20 minutes. Measures of receptive language created by the researchers were used to determine target achievement during the intervention period. Children were asked to distinguish the target word from three other foil pictures. Results suggested that children who received Spanish and English vocabulary instruction obtained significantly higher receptive target gains in English and Spanish during the post-test when compared to the group that received English-only instruction (Méndez
et al., 2015). Benefits of vocabulary interventions or instruction that incorporate L1 and L2 can promote the acquisition of L1 and L2. Further, L1 may facilitate L2 vocabulary learning, supporting the interdependence model of second language acquisition (Cummins, 1981).

**Vocabulary Strategies for ELLs**

A variety of vocabulary instructional strategies can be combined to increase the word knowledge of ELLs. In the current study five evidence-based instructional strategies to promote vocabulary were employed: shared book reading, repeated vocabulary, child-friendly definitions, exposure to the vocabulary in multiple modalities, and the use of supplemental L1 for naming and definition. Shared book reading has been shown to provide a strong context for vocabulary development for monolingual and ELL children (Biemiler & Boote, 2006; Kindle, 2009; Restrepo et al., 2013; Whitehurst et al., 1999). Children who are engaged in adult-mediated storybook reading learn novel words both incidentally (Carey, 1978; Biemiller & Boote, 2006) and as the reader stops and elaborates on the vocabulary targets, providing an explanation, demonstration, and/or example (Justice, 2002). Studies examining the use of L1 during instruction or intervention with preschool-aged ELLs have suggested growth occurs in vocabulary in L1 and L2 through storybook reading (Lugo-Neris et al., 2010; Méndez et al., 2015; Restrepo et al., 2013).

Interactive storybook reading is one of the most investigated vocabulary interventions for preschoolers. Simply listening to storybooks is effective in acquiring vocabulary (NICHD, 2000). However, researchers have found that when storybook instruction is supported with other vocabulary strategies, the acquisition of vocabulary can be more substantial. For example, Whitehurst et al. (1994) investigated the use of book reading at home and book reading with phonological awareness strategies in the classroom to assess emergent literacy skills in children.
This research includes dialogic reading instruction of vocabulary. This is a strategy that increases the participation of the child when a book is shared by the adult and the child. The strategies used in this research included Completion prompts, Open-ended prompts, Wh-prompts, and Distancing prompts (CROWD). Parents and teachers were also trained to Prompt the child’s response, Evaluate child’s response, Expand the child’s response, and Repeat the child’s utterance (PERR). Children who participated in the study were split into two groups: home and school book reading intervention (n = 110) or no instruction (n = 97). Receptive and expressive vocabulary were assessed using the Peabody Picture Vocabulary Test—Revised, Form M (PPVT-R; Dunn & Dunn, 1981), the Expressive One Word Picture Vocabulary Test (EOWPV; Gardner, 1981), and sound letter identification normative tests. During the year-long intervention period, 30 books were used, one book per week. When pre- and post-test means were compared children in the intervention group showed significantly better results on the vocabulary tests. Scores for students in the intervention group were further augmented when parents were actively involved in instruction (Whitehurst at al., 1994).

Using shared book reading with additional instructional strategies (i.e., repeated stories, computer assisted story reading, and vocabulary related activities) appears to be more effective than shared book reading alone (Silverman, 2007; Swanson, et al., 2011). Strategically repeating vocabulary targets at the beginning, during, and at the end of the book can provide additional support in the acquisition of the target words (Biemiller & Boote, 2006). Coyne, Simmons, Kame'enui, and Stoolmiller (2004) explored the use of shared storybook reading with explicit vocabulary instruction for kindergarteners at risk of reading failure. Ninety-six children from seven schools were assigned to one of three groups: storybook intervention, phonologic and alphabetic skills (code-based group), and sound and letter module (control group). Children in
the intervention group received 30 minutes of storybook intervention for six months. Three vocabulary words were taught each week using explanations during the storybook group. Researchers also used strategies of word consciousness by asking children to raise their hands to identify vocabulary words in the story. The intervention group (storybook with explicit vocabulary) showed an increase in expressive vocabulary when compared to the code based group and the control group (Coyne et al., 2004). Similar findings were noted by Justice, Meier, & Walpole (2005) who investigated the acquisition of vocabulary words in 57 kindergarteners. Teachers provided repetition of storybook readings in small groups of six children. Children were divided in two groups, treatment and control. They were exposed to ten words per book across six books, with the instructor providing an explanation of the meaning of 30 of the 60 target words. Children in the intervention group showed significant vocabulary gains when the vocabulary was elaborated or explained (Justice et al., 2005). These findings suggest that repeated storybook readings are effective for increasing children’s vocabulary.

Repeated exposure has also been found to be an effective strategy for increasing children’s vocabulary. Research suggests that when the book reading is repeated and vocabulary is explained there is a better chance that preschoolers will acquire vocabulary words. Biemiller and Boote (2006) studied the effect on vocabulary acquisition when children received repetition of the storybook and direct explanation of word meanings. Forty-three kindergarten, first, and second grade students participated in this research. Children were read storybooks and provided with twelve target words using meaning explanation and twelve other words with no explanation. A sequence of five days of instruction was developed for each storybook. Findings suggest that of the total of words learned by the children, 12% were acquired by the repetition of the storybooks and 10% were acquired as a result of word explanation. A second analysis was done
with same methods the following year. Results indicated that from the total of words learned, more than 40 percent were acquired as a result of word meaning explanation (Biemiller & Boote, 2006).

Providing supplementary opportunities to hear and say the vocabulary item outside of the book reading experience may also facilitate vocabulary acquisition (Gutiérrez-Clellen et al., 2013; Sénéchal, Thomas, & Monker, 1995; Ukrainetz, 2006). The use of child-friendly definitions represents another strategy to expand children’s vocabulary. Simple definitions help children to make connections between new vocabulary words and their already established lexicon as well as their experiences (Collins, 2005; Hickman, Pollard-Durodola, & Vaugh, 2004; Lugo-Neris et al., 2010; Penno, Wilkinson, & Moore, 2002; Silverman & Hines, 2009). The use of vocabulary in multiple modalities such as reading, writing, pictures, and especially meaningful activities further enhances contextual learning (Beck & McKeown, 2007; Gutiérrez-Clellen et al., 2013; Méndez et al, 2015). Combining a variety of techniques to teach vocabulary with the inclusion of both L1 and L2 may be an effective vocabulary intervention (Restrepo et al., 2010; Lugo-Neris et al., 2010; Méndez et al., 2015). Supplementary word naming and definitions in L1 during intervention may facilitate expressive vocabulary in both L1 and L2 (Collins, 2010; Lugo-Neris et al., 2010). These outcomes may be possible even when the intervention is primarily delivered in L2.

Promoting Vocabulary with Text-To Speech (TTS)

Vocabulary interventions for ELLs that use L1 may be difficult for monolingual SLPs and educators to implement since these professionals often do not speak the child’s first language. Fortunately, advances in technology may help monolingual SLPs design interventions that target vocabulary in both L1 and L2 (Dalton & Grisham, 2011; Durkin, Conti-Ramsden,
2013; Gillam, et al., 2008). Computers have become ubiquitous in schools across the US. The number of devices and the availability of media is increasing creating an impetus to explore new ways in which clinicians can use technological approaches in ELL instruction (Urkin & Conti-Ramsden, 2013). Computer assistance in intervention is a promising tool that may help to facilitate speech and language intervention (Durkin & Conti-Ramsden, 2013; Dalton, & Grisham, 2011). With these issues in mind, this section reviews research that has investigated the use of technology to increase vocabulary.

Computer software has been shown to be an effective tool for increasing vocabulary knowledge in L2 preschoolers. In particular, software incorporates prerecorded voice presentations of multiple repetitions of words and translations as well as video and images that can be used without the presence of an instructor (Leacox & Jackson, 2012; Silverman & Hines, 2009). Silverman and Hines (2009) investigated the use of multimedia-enhanced book reading in a vocabulary instruction for ELLs and monolingual children in prekindergarten through second grade. Intervention was provided for 12 weeks using two conditions: traditional shared book reading and multimedia-enhanced storybook reading. The vocabulary knowledge gap that existed between ELLs and monolingual children before intervention was eliminated for the target vocabulary and reduced for general vocabulary following the multimedia-enhanced condition (Silverman & Hines, 2009). Likewise, Leacox and Jackson (2012) examined Spanish and English vocabulary word acquisition under two conditions. One group of children received book reading by an adult to teach vocabulary by incidental exposure and the second group listened to an electronic book with Spanish-bridging vocabulary instruction. The electronic book had embedded Spanish vocabulary definitions. Preschoolers who received vocabulary instruction with Spanish-bridging via computer (i.e. listening to a voice recorded e-book) gained greater
receptive and naming knowledge of English words when compared with children who received adult English-only reading of a storybook (Leacox & Jackson, 2012).

Text-To-Speech (TTS) is a computer feature that transforms text into synthetic voice. This application is most often used for translation, to aid individuals who are visually impaired, or to aid in the pronunciation of new words. The use of TTS facilitates word learning by providing the correct pronunciation of new words (Baker & Jones, 1998; Huang & Liao, 2015; Olsen & Wise, 1992). It has been identified as a useful tool to increase vocabulary in children (Proctor et al., 2011). TTS can enable monolingual SLPs to include vocabulary in L1 for ELLs (Augustyn, 2013; Dalton, Proctor, Uccelli, Mo, & Snow, 2011; Durkin & Conti-Ramsden, 2013; Garg, 2011; Olson & Wise, 1992; Proctor, et al., 2011). For example, Dalton and colleagues (2011) examined reading comprehension strategies using an interactive vocabulary program known as Improving Comprehension Online (ICON). Participants included 75 monolinguals and 31 bilinguals (Spanish-English bilinguals) from fifth grade. Children were assigned to one of three conditions: comprehension strategy (received digital text, and audio-recording), vocabulary strategy (with strategies that support vocabulary such as digital glossaries, and Spanish English cognates), or combination strategy including comprehension and vocabulary components. Students were asked to complete tasks within their ICON condition which included the use of Spanish text translation with TTS for the bilingual group. Dalton et al. report that monolingual and bilingual children in the English vocabulary strategy group outperformed students in the comprehension strategy group.

Further, Proctor and colleagues (2011) examined the use of the ICON program to teach vocabulary intervention in both English and Spanish-English children. Two hundred forty students participated in the study including 118 Spanish-English bilinguals. The intervention
took place over a 16-week period and consisted of multimedia text with 40 targets (5 words per text) and reading strategies to support vocabulary and comprehension. TTS in both Spanish and English languages was made available for bilinguals. Breath of vocabulary (vocabulary size) and the depth of word knowledge were assessed through a multiple choice test created by the researchers and administrated before and after the intervention. All children participating in the intervention showed significant vocabulary depth when compared to children who did not receive vocabulary intervention. Children did not show the same effect with regard to increases in vocabulary size (Proctor et al., 2011).

As the Hispanic population in the U.S. increases, there is an urgent need to support language learning for children whose native language is Spanish (Hammer, Jia, & Uchikoshi, 2011). This suggests the need to develop techniques that help monolingual SLPs increase vocabulary in both languages to assist children who are at risk for school failure, including those with speech/language impairments (Kohnert, Yim, Nett, Kan, & Duran, 2005). The use of technology such as TTS to provide spoken vocabulary words and definitions in L1 may be an appropriate tool to help clinicians support vocabulary enrichment during intervention.

**Shyness and Vocabulary Intervention**

Vocabulary strategies that have been used during shared book reading include: introducing new vocabulary before, during, and after storybook readings (Biemiller & Boote, 2006); including L1 during the reading to promote greater gains in English vocabulary (Lugo-Neris et al., 2010); and the use of multiple modalities and varied vocabulary encounters during intervention (Beck & McKeown, 2007; Gutiérrez-Clellen et al., 2013; Méndez et al, 2015). However, there is limited data regarding whether these strategies benefit shy children compared with those who are more extroverted. Research is needed to determine if vocabulary instruction
during shared book reading which is targeted to children who are ELLs is equally successful for children who are identified as shy and those who are not. The following section investigates the effect of shyness on ELLs.

Shyness has been defined as a form of social withdrawal in which social interactions become more infrequent (Keller, Trosech, & Grob, 2013). Shyness is the manifestation of anxiety and avoidance of social interactions characterized by limited participation in conversation and restrained use of language (Coplan & Rubin, 2010). Monolingual children who are shy demonstrate more limited expressive language skills (less complex narratives, fewer sentences, and fewer questions) when compared to children who are not shy (Reynolds & Evans, 2009; Crozier & Perkins, 2002). Children who are shy typically have language skills below their age norms especially in the areas of receptive (Spere & Evans, 2009) and expressive language (Spere, Schmidt, Theall-Honey, & Martin-Chang, 2004), phonemic awareness (Spere et al., 2004), and pragmatic language (Coplan & Weeks, 2009).

Shyness has been extensively reviewed in the psychological literature, with scholars demonstrating that this trait can have a deleterious impact on the child and his or her social development. Caplan and Armer (2005) explored the role of shyness in expressive language development in first language acquisition, noting that shyness typically results in maladjustment and the inability of children to engage in vital social interactions where expressive language capabilities are most commonly developed. Howarth, Guyer, and Perez-Edgar (2013) consider the general implications of shyness for the child’s social development. This research suggests that shyness typically impacts the ability of the child to initiate social interactions, often resulting in peer rejection. This situation can have systemic implications for the child, leading to poor mental health trajectories as well as isolation from social environments including school and the
community (Howarth et al., 2013). Coplan, Kingsbury, and Doey (2014) further review shyness and its implications for child and adolescent development, noting that this factor can lead to significant problems with social adjustment which, in turn, result in difficulty with peer relationships which can lead to academic difficulties.

Two approaches have been suggested to explain the link between language skills and shyness. First, language assessments used in research studies have been shown to increase anxiety in children, and in consequence, shy children may achieve lower scores on language tests (Crozier & Hostettler, 2003). Research indicates that shy children who were recorded at home showed better language performance when compared to performance on a language assessment administered by an unfamiliar person (Crozier & Meier, 1993). A second explanation suggests that children who are shy present lower language ability because they avoid social interactions and conversations, which could increase their language competence (Keller et al., 2013). Limited social interactions may also contribute to reduced language skills since teachers and peers offer less communication support to shy children, when compared to those who are not shy (Rudasill & Rumm-Kaufman, 2009). Although these theories attempt to explain the connection between shyness and language skills, the relationship is still not clear (Spere et al., 2004; Keller et al., 2013). However, the reality is that children who are shy underperform in comparison to their peers who are not shy in receptive and expressive language tasks. If shyness is present in ELLs, who already have limited language skills, it might be an additional factor hindering their language development.

**Shyness and Language Development in ELLs**

The dramatic increase in the number of ELL students has served as the impetus for educators and clinicians to better understand the needs of children, and how to develop better
strategies to serve this population (Cena et al., 2013). Low academic performance of ELLs in English across all grades has prompted concern over what can be done to enhance outcomes for this population (Cena et al., 2013; NCES, 2012). A wide range of variables have been identified to explain the challenges facing this group, including poverty, lower graduation rates, limited English proficiency, limited vocabulary knowledge, and lack of systemic and explicit vocabulary instruction in schools (Cena et al., 2013; Shatz & Wilkinson, 2010).

Although it is evident that a myriad of variables may influence academic success for ELLs, scholars have more recently begun to focus on the behavior of ELLs. In particular, scholars have noted that ELLs with language competence may fail to engage in language tasks or to have academic performance commensurate with their English-speaking peers (Tong, Ting, & McBride-Chang, 2011). Ash, Rice, and Redmond (2014) highlight these issues, suggesting that shyness and unsocial behavior are characteristics of ELLs resulting in poor peer interactions that are similar to those experienced by children identified as withdrawn. Even competent ELLs may lack conversational initiation as well as social assertiveness, manifesting a higher level of anxiety during recreational language activities with peers (Ash et al., 2014).

Preston (2014) indicates that there are a number of components of second language acquisition that are being overlooked in attempts to understand the process and the factors related to second language acquisition. Some second language developmental theories suggest that children in the early stages of second language development enter a stage where expressive communication is limited while they are acquiring sufficient second language competence to communicate. This stage is called the nonverbal period (Tabors, 1997). However, Roberts (2014) analyzed evidence of research regarding the nonverbal period and found that there is limited research to support this assertion. Another characteristic observed in ELLs is selective
mutism. Selective mutism is characterized by failure to speak in one setting while being able to speak in others (APA, 2013). ELLs have been identified as having a higher rate of selective mutism when compared with their monolingual peers. Prevalence reports in Canada, Switzerland, Germany, and Israel have found higher rates of selective mutism in immigrant children than nonimmigrant children. Selective mutism can be differentiated from the nonverbal period as mutism is prolonged and present in both languages (Preston, 2014; Toppelberg, Tabor, Coggins, Lum, & Burger, 2005). ELLs with selective mutism do not talk in either their first or second language.

It has been proposed that shyness in ELLs is a characteristic that pertains only to certain cultures (Gudiño & Lau, 2010); however, although shyness might not be considered as a negative outcome in non-western cultures (Ash, Rice, & Redmond, 2014; Coplan, Weeks, & Chen, 2012), researchers suggest that shyness is actually found in many countries including the United States, China, Canada, Russia, Saudi Arabia, and India (Bowker, & Raja, 2011; Coplan, Zheng, Weeks, & Chen, 2012; Crozier & Badawood, 2009; Prakesh & Coplan, 2007). This suggests that the phenomenon is not culturally bound and may have implications for all ELLs regardless of their native culture.

Research regarding the impact of shyness on language development is still in its early stages; however, the existing literature does provide some important insight into the issue and warrants consideration. ELLs at English-only schools, may present shyness and anxiety as they have to face interactions with the unfamiliar language used by educators and peers (Hoff, 2006; Keller et al., 2013). Recent research suggests that shyness and unsociability can be notable in ELLs, particularly when children participate in non-native language contexts. Ash and colleagues (2014) examined the effect of language context on shy school-aged ELLs to
determine if shyness could be identified and measured within this group in the US. Children who participated in this research were born in twelve different countries and spoke nine languages. The authors examined the level of shyness in ELLs with parent and child questionnaires. ELLs were shy in English contexts and more sociable when speaking their native language. Ash and coworkers go on to note that recognition of shyness in ELLs can and should be used as a foundation for investigating the influence of internal social attitudes like shyness on language to facilitate comprehensive support for the student. Evaluation of shyness in different settings is needed to fully understand the impact of shyness and its implications for language acquisition (Ash et al., 2014).

Few studies have investigated the effects of shyness in second language acquisition. These studies have found a correlation between ELLs’ shyness and language development in L1 and L2. Strand, Pula, Parks, and Cerna (2011) studied the relationship between receptive language skills and shyness in ELLs who were native Spanish speakers in the US. This research included 340 preschoolers that were assessed with a receptive vocabulary test and the Peabody Picture Vocabulary Test, Third Edition (PPVT; Dunn & Dunn, 1997). The researchers used the Listening and Speaking Subscale of the Developmental Continuum Assessment System (DCAS; Dodge, Colker, & Heroman, 2002) to determine child’s capacity to communicate appropriately with others. They used a shyness scale, The Shy–Anxious Subscale of the Teacher–Child Rating Scale (T-CRS; Hightower et al., 1986) to assess children’s shyness–anxiousness. Correlation analysis showed that shyness predicted the future receptive language acquisition of ELLs, and not vice versa; current receptive language performance did not predict shyness levels in this population. Similarly, Tong et al. (2011) examined the relationship between shyness and vocabulary skills in Chinese kindergartners learning English as a second language. Children’s
receptive and expressive vocabularies were assessed in Chinese and English, and children’s shyness was measured with a parent rating scale. In this study, shyness was associated with deficits in receptive language for L1 and L2. Shyness may limit motivation and willingness to engage in communication, resulting in deficits that impact the child over the long-term (Tong et al., 2011).

Shyness in ELLs has been shown to have a negative impact on receptive and expressive language in both L1 and L2. Keller et al. (2013) provided important insight into the implications of shyness for second language learning. These authors begin their discussion of shyness with its effect on first language development, asserting that shy children typically demonstrate less favorable language development when compared with non-shy peers. In the context of second language development, Keller and coworkers hypothesized that shyness will also have a strong and negative effect on outcomes. In an effort to test this hypothesis, Keller and colleagues utilized standardized testing and parental ratings to assess language competence in a sample of 330 immigrant preschoolers. The results suggested that shy ELLs demonstrated lower L2 competency as well as slower L1 development when compared with their non-shy peers (Keller et al., 2013). Based on these findings, Keller et al. contend that contextual, as well as personality factors, must be taken into consideration when providing second language instruction for ELLs. Finding ways to support children who are shy in learning language is imperative to ensure that expressive language deficiencies do not persist and impact the child’s language development over the long-term.

Synthesis of the research indicates that shyness is an issue of concern, which should be assessed and incorporated into efforts to meet the educational and language needs of ELLs. Given this relationship, it is imperative to determine if the language strategies used to support
language learning in ELLs are effective for improving the language development of all ELLs and if children who are shy benefit from the same instruction as those who are not. Expressive vocabulary is one aspect of language learning that is essential the success of ELLs in school. Further, a number of specific interventions have been found to be useful for enhancing expressive vocabulary for ELLs (Lugo-Neris, et al., 2010; Méndez et al., 2015). However, there is a paucity of empirical research that addresses how shyness might impact the outcomes of intervention.

Failure to address the possible impact of shyness on progress in language learning will continue to limit the ability of clinicians to overcome pertinent second language barriers that may currently be viewed as recalcitrant to change. The need for research that provides information about the effect of vocabulary teaching strategies with shy and non-shy ELLs will provide insight regarding how to target the individual needs of ELLs in the future. Understanding what works to meet the needs of shy ELLs is critical to ensuring that comprehensive supports are provided to this population.

**Strategies to Help Children Overcome Shyness**

Evans (2001, 2010), and Coplan and Arbeau (2008) suggested several strategies for helping shy children overcome barriers to social interaction. Some of these strategies may support teachers and clinicians who work with ELLs who are shy. For instance, clinicians can help reduce stress associated with committing language mistakes. Encouraging children for trying or praising them discreetly with a verbal affirmation or a smile may help children to feel more socially competent (Chang, 2003). Children may also benefit from working in small groups targeting their individual needs, being able to predict the classroom routine, participating in activities that promote the imagination (i.e., fantasy activities), and having more time to respond
to questions.

Improving social encounters during intervention could be a successful way to improve language skills in children who are shy. For example, the use of scripted speech, verbal games, and board games that require verbal turn-taking is recommended to improve the child’s confidence in communication exchanges. Teaching children pragmatic skills can support children to know how to react in different social situations (i.e. asking for help, entering a group conversation, starting conversation). Children seem to benefit from having the support of a friend who can provide emotional support to interact with peers (Hodges, Boivin, Virao, & Nukowski, 1999). Having a friend who speaks L1 may help to improve a shy student’s interactions with L2. As previously mentioned, ELLs could benefit when L1 is used in the classroom as it may support the ability of the child to communicate his or her feelings and emotions further supporting the acquisition of L2 (Winsler, Kim, & Richard, 2014). The use of these strategies with ELLs who are shy may support their confidence to interact in the classroom and to perform in a more social atmosphere that promotes the development of both languages.

Summary and Conclusions

The benefits of a bilingual approach for children who are learning two languages have been suggested in a number of studies (Lugo Neris et al., 2010; Méndez et al., 2015; Restrepo et al., 2013). However, the number of bilingual professionals working in schools and clinical settings is limited, and thus children may not have access to bilingual teaching approaches that target their L1 and L2 language needs. The use of TTS with supplemental Spanish vocabulary used by SLPs and educators may facilitate Spanish and English expressive vocabulary for ELLs. Shyness may also be a factor shaping language development for ELLs. Research examining the relationship between shyness and vocabulary in monolingual and bilingual children demonstrates
that shyness represents a risk factor for the development of language and vocabulary skills (Coplan & Weeks, 2009; Keller et al., 2013; Prior et al., 2008; Spere & Evans, 2009). However, the impact of shyness on vocabulary gains during vocabulary intervention has not been reported.
Chapter II.
The Use of Text-To-Speech to Teach Vocabulary to English Language Learners

Children who are learning English as a second language (L2), while continuing to develop their first language (L1) at home, are known as English Language Learners [ELLs] (Flores, 2016). Of the 11.2 million ELLs in school in the United States, 2.7 million have limited English proficiency (Aud et al., 2012). Hispanics or Latinos are the largest minority group in United States with approximately 50 millions of people, and a vast majority speaking Spanish as their L1 (Passel, Cohn, & Lopez, 2011). Further, the Hispanic American population will double in size over the next decade (Colby & Ortman, 2015). Knowledge of the language of instruction, including vocabulary, is critical for success in school (Lee, 2011; Parra, Hoff, & Core, 2011). This is important because bilingual Hispanic children have been found to perform below their monolingual peers in English and Spanish (Mancilla-Martinez, & Lesaux 2011; Páez, Tabors, & Lopez, 2007; Umbel, Pearson, Fernandez, & Oller, 1992). Vocabulary intervention that includes the L1 of the child has been found to be preferable to English-only intervention as bilingual approaches support both L2 and L1 vocabulary growth. (Barnett et al., 2007; Lugo-Neris, Jackson, Goldstein, 2010; Méndez, Crais, Castro, & Kainz, 2015; Restrepo, Morgan, & Thompson, 2013). In light of the growth of this population and the importance of English proficiency for school success, the dearth of bilingual Speech-Language Pathologists (SLPs) in the United States to serve children who need instruction in their L1 or both L1 and L2 has created a national problem. A demographic profile of ASHA members in 2015 revealed that only 6,594 SLPs identified themselves as Spanish-English bilingual (ASHA, 2016). Many SLPs working in the United States are monolingual English-speakers and lack the ability to deliver intervention services in Spanish. New evidence-based strategies to support monolingual SLPs in
the delivery of vocabulary interventions to Spanish-speaking ELLs are essential to ensure their academic success.

**Vocabulary Development in ELLs**

Vocabulary is associated positively with the development of decoding of words (Nation & Cocksey, 2009) and later reading comprehension (Duff, Reen, Plunkett, & Nation, 2015; Elleman, Lindo, Morphy, & Compton, 2009; Lee, 2011). Researchers suggest that the level of vocabulary knowledge in L2 (e.g., English) is related to L2 reading comprehension (Proctor, Carlo, August & Snow; 2005). Furthermore, vocabulary knowledge in L1 (i.e., Spanish), is positively associated with reading comprehension, and fluency in L2 (i.e. English) (Proctor, Carlo, August & Snow, 2006). These findings suggest that children who are ELL may transfer certain skills across languages. Deficits in academic vocabulary knowledge may have a negative impact on child’s reading comprehension and consequently academic performance (Proctor et al., 2006).

A significant vocabulary gap between ELLs and their monolingual peers, impacts ELLs’ academic performance in school (Mancilla-Martinez & Lesaux, 2011; Páez et al., 2007; Umbel et al., 1992). This gap may be explained partially by environmental factors such as quantity and quality of parent-child interactions (Shneidman, Buresh, Shimpi, Knight-Schwarz, & Woodward, 2009), parents’ socioeconomic status (Biemiller & Slonim, 2001; Capps et al., 1999), and parents’ education level (Capps et al., 1999; Waldfogel, 2012). However, an additional factor is that ELLs distribute their vocabulary across two or more languages depending on the exposure to and use of each language (Oller, Pearson, & Cabo-Lewis, 2007). Because vocabulary is distributed across two languages, vocabulary growth in one language may occur more slowly (Hammer et al., 2014). This may result in a smaller vocabulary in each language (Conboy &
Thal, 2006), but researchers have suggested that vocabulary size of ELLs may be comparable to monolinguals when vocabulary in both languages is taken into account (Paradis, 2005; Umbel et al., 1992). Despite the fact that ELLs’ vocabulary is distributed across languages, research indicates that the English vocabulary gap continues after years of English-only education (Mancilla-Martinez & Lesaux, 2011). Limited vocabulary knowledge in the child’s L2, when that language is the mainstream language, can have a detrimental effect on the child’s communication needs, and ultimately lead to academic failure. New methods of instructional support are needed to promote vocabulary acquisition and L2 proficiency in ELLs.

A question that arises is whether a clinician should use L1 during intervention. There are many advantages associated with supporting the development of a child’s L1. The literature suggests that Spanish-English bilinguals’ advantage include better phonological abilities (Bialystok, Majumder, & Martin, 2003), executive functions (Carlson & Meltzoff, 2008), and deepening family relationships and cultural pride (Zelasko & Atunez, 2000). Although, the benefits of knowing a L2 are relevant in a globalized world, the reality is that children who face minimal academic opportunities, exposure, and encouragement for using L1 are in danger of L1 loss (Anderson, 2012; Fillmore, 1991, 2000). Explanations for the lack of use of L1, may include the limited number of providers who are able to deliver education and intervention in L1 and L2, skeptical views of bilingual instruction/intervention, and state legislation that regulates the language of instruction in school (McQuillan & Tse, 1996; Kohnert & Derr, 2012). New strategies that target the English L2 vocabulary gap while supporting the maintenance and growth of L1 in preschoolers are essential to support the communication needs of ELLs in the US.
Issues Surrounding Language of Intervention/Instruction

The language used for teaching vocabulary in school plays an important role in ELLs’ vocabulary development (Gutierrez-Clellen, 1999; Simón-Cereijido, Gutiérrez-Clellen, & Sweet, 2013). Researchers have compared the effect of the language of instruction or intervention to understand the approach that best supports ELLs’ vocabulary development. Two main approaches have been compared: monolingual instruction (L2-only) and bilingual instruction (L1 and L2).

Monolingual instruction. The use of a L2-only model is supported by the premise that the more a child is exposed to a language the better skills the child will have in that language (Hammer, Lawrence, & Miccio, 2008; Hoff et al., 2012; Marchman & Martínez-Sussmann, 2004; Pearson, Fernandez, Lewedeg, & Oller, 1997). However, the use of L2-only instruction has been questioned for two reasons.

Evidence suggests that L2-only models have failed to close the English vocabulary gap when children participate in L2-only instruction at school (Mancilla-Martinez & Lesaux, 2011; Páez et al., 2007; Umbel et al., 1992). For example, Mancilla-Martinez and Lesaux (2011), followed Spanish-speaking ELLs from 4- to 11-years, to determine their spoken language and reading abilities at six time points. Expressive vocabulary skills of ELLs were examined using Spanish and English versions of the same standardized language test. ELLs who received English-only instruction, performed below the national monolingual norm on the expressive vocabulary tests in English and Spanish across six ages.

Instructional methods that support only L2, not only have failed to close the gap in English only, but also can jeopardize the maintenance and growth of L1 (Anderson, 2012; Barnett, Yarosz, Thomas, Jung, & Blanco, 2007; Restrepo et al., 2010; Umbel et al., 1992). Páez
Tabors, and Lopez (2007) examined vocabulary acquisition in bilingual preschoolers in Massachusetts and Maryland and monolingual Spanish-speaking preschoolers in Puerto Rico. Bilingual children were in classrooms where English was the dominant classroom language. The children’s language skills were examined at the beginning and end of the academic year. Bilingual children received Spanish and English versions of the same standardized language test while monolingual Spanish speakers were examined only in Spanish. Expressive vocabulary was evaluated through picture naming. ELLs, who were educated in English-only, performed two standard deviations below the national mean in English vocabulary. When the mean Spanish vocabulary of bilingual children was compared to the mean of monolingual Spanish speaking children, ELLs performed below the monolingual Spanish speaking children at both test time.

**Bilingual instruction.** Historically, bilingual approaches were thought to have a negative impact on ELL’s English language acquisition, and bilingualism was considered to be responsible for poor academic performance in ELLs (Baker & Jones, 1998). However, studies have not found poorer English vocabulary gains when comparing English-only and bilingual instruction/intervention (Barnett et al., 2007; Lugo-Neris, Jackson, Goldstein, 2010; Méndez, Crais, Castro, & Kainz, 2015; Restrepo, Morgan, & Thompson, 2013). In addition, bilingual interventions have been found to not only increase vocabulary in English as effectively as English-only interventions, but also provide significant gains in Spanish vocabulary (Méndez, et al., 2015; Restrepo et al., 2013; Schwartz, 2014). In fact, some researchers have suggested that teaching children new vocabulary in the L1 may facilitate the acquisition of vocabulary in the L2 (Lugo-Neris et al., 2010; Méndez et al., 2015), and bilingual approaches promote the acquisition of other language skills in the L2 such as prepositions and pronouns (Perozzi & Chavez-Sanchez, 1992), as well as literacy skills (Farver, Loningan, & Eppe, 2009).
In summary, ELLs who participated in bilingual interventions have demonstrated greater gains in vocabulary in both L2 and L1 when compared to ELLs who participated in English-only intervention. English-only intervention has not been shown to promote the development of L1 vocabulary. (Barnett et al., 2007; Lugo-Neris et al., 2010; Méndez et al., 2015; Restrepo et al., 2013).

**Vocabulary Strategies for ELLs**

A variety of vocabulary instructional strategies can be combined to increase the word knowledge of ELLs. In this study, we used five evidence based instructional strategies to promote vocabulary: shared book reading, repeated vocabulary, child friendly definitions, exposure to the vocabulary in multiple modalities, and the use of supplemental L1 for naming and definition. Shared book reading has been shown to provide a strong context for vocabulary development for monolingual and ELL children (Biemiler & Boote, 2006; Kindle, 2009; Restrepo et al., 2013; Whitehurst et al., 1999). Children who are engaged in adult-mediated interactions around stories learn novel words both incidentally (Carey, 1978; Biemiller & Boote, 2006) and as the reader stops and elaborates on the vocabulary targets, providing an explanation, demonstration, and/or example (Justice, 2002). Studies examining the use of the L1 during instruction or intervention with ELLs have suggested growth in vocabulary in L1 and L2 when storybook reading is used with ELL preschoolers (Lugo-Neris, et al., 2010; Méndez, et al., 2015; Restrepo, et al., 2013). Using shared book reading with additional instructional strategies (i.e. repeated stories, computer assisted story reading, and vocabulary related activities) can be even more effective (Silverman, 2007; Swanson, et al., 2011). Strategically repeating vocabulary targets at the beginning, during, and at the end of the book can provide additional support in the acquisition of the target words (Biemiller & Boote, 2006). Also, providing supplementary
opportunities to hear and say the vocabulary item outside of the book reading experience may help a child acquire the vocabulary (Simón-Cereijido et al., 2013; Sénéchal, Thomas, & Monker, 1995; Ukrainetz, 2006). Using child friendly definitions is another strategy that helps children acquire new words. These simple definitions help children to make connections between the new vocabulary words and their already established lexicon as well as their experiences (Collins, 2005; Hickman, Pollard-Durodola, & Vaugh, 2004; Lugo-Neris et al., 2010; Penno, Wilkinson, & Moore, 2002; Silverman & Hines, 2009). The use of vocabulary in multiple modalities such as reading, writing, pictures and especially meaningful activities further enhances contextual learning (Simón-Cereijido et al., 2013; Méndez et al., 2015; Silverman, 2007).

Combining the use of a variety of techniques to teach vocabulary with the inclusion of both L1 and L2 may be an effective vocabulary intervention (Restrepo et al., 2010; Lugo Neris et al., 2010; Méndez et al., 2015). Supplementary word naming and definitions in L1 during intervention may facilitate expressive vocabulary in both L1 and L2 (Collins, 2014; Lugo-Neris et al., 2010) even when the intervention is primarily delivered in L2. However, vocabulary interventions for ELLs that use L1 may be difficult for monolingual SLPs and educators to implement since they do not speak the child's L1. Fortunately, advances in technology may help monolingual SLPs design interventions that target vocabulary in both L1 and L2 (Dalton & Grisham, 2011; Durkin & Conti-Ramsden, 2014; Gillam, et al., 2008).

The use of a computer has been found to be an effective tool to increase vocabulary knowledge in preschoolers who are learning L2 because it incorporates prerecorded voice presentations of multiple repetitions of words and translations as well as video and images that can be used without the presence of an instructor (Leacox & Jackson, 2012; Silverman & Hines, 2009; Traore & Kyei-Blankson, 2011). Silverman and Hines (2009) investigated the use of
multimedia-enhanced book reading in a vocabulary instruction for ELLs and monolingual children in prekindergarten throughout second grade. Intervention was provided for 12 weeks using two conditions: traditional shared book reading and multimedia-enhanced storybook reading. The vocabulary knowledge gap that existed between ELLs and monolingual children at pretest was closed for the target vocabulary and narrowed for general vocabulary following the multimedia-enhanced condition. Leacox and Jackson (2012) found that preschoolers who received vocabulary instruction with Spanish-bridging via computer (i.e. listening to a voice recorded e-book) gained greater receptive and naming knowledge of English words than children who received adult English-only reading of a storybook.

Text-to-speech (TTS) is a computer feature that transforms text into synthetic voice. This application is most often used for producing audio (spoken word) from electronic text. In school, it can allow students to listen to new vocabulary, narratives, academic content, etc. TTS can be found online as a free online web-based translator or can be downloaded as software for a computer or tablet, making this application readily available, inexpensive, practical, and easy to use. The use of TTS can provide auditory accessibility to a foreign language (Moon, 2012) and facilitate word learning for ELLs by providing the correct pronunciation of new words (Baker & Jones, 1998; Huang & Liao, 2015; Olsen & Wise, 1992), and TTS may be promising to allow monolingual SLPs to include vocabulary in L1 for ELLs (Augustyn, 2013; Dalton & Grisham, 2011; Durkin & Conti-Ramsden, 2014; Garg, 2011). The use of TTS using machine translator technology is not completely reliable because available programs may produce grammatically incorrect translations; however, it can be a powerful tool if the accuracy of the translation is verified and corrected by a proficient Spanish speaker.
Due to the increase of the Hispanic population in the U.S., there is an urgent need to support language learning for children whose native language is Spanish (Hammer, Jia, & Uchikoshi, 2011). This suggests the need for techniques that help monolingual SLPs increase vocabulary in both languages for children who are at risk for school failure, including those with speech/language impairments (Kohnert, Yim, Nett, Kan, & Duran, 2005). The use of technology such as TTS to provide spoken vocabulary words and definitions in L1 may be an appropriate tool to help clinicians support vocabulary enrichment during intervention. The purpose of this research was to determine the effectiveness of vocabulary intervention using an online text-to-speech computer program delivered by a monolingual clinician to provide vocabulary words and definitions in L1, for Spanish-speaking English language learners. This research addressed the following research questions:

1. Is there a significant difference among the pretest, posttest and follow-up vocabulary scores (naming and definition) in L2 (English) of ELLs in the Spanish-English intervention (SEI) group with the use of Text-to-Speech, the English-only intervention (EI) group, and the control group?

2. Is there a significant difference among the pretest, post-test and follow-up vocabulary scores (naming and definition) in L1 (Spanish) of ELLs in the Spanish-English intervention (SEI) group with the use of Text-to-Speech, the English-only intervention (EI) group, and the control group?

Methods

Participants

Participants in this study were 43 Spanish-speaking children recruited from six classrooms at one Head Start center in the Midwest. Approximately 50% of the children at this
Head Start program are Latino-Hispanic. Children in the selected classrooms attended Head Start half day and received English-only education. There were 17 boys and 26 girls between the ages of 3;1 and 5;0 years old with a mean age of 4;26 (SD = .55).

Children met the following inclusion criteria: (a) Parent consent was obtained for each participant. (b) Parent report confirmed the use of Spanish as the primary language of communication at home. (c) Children passed the speech, language, and hearing screening provided for all children at the Head Start center. (d) Children had normal nonverbal IQ (e.g. standard score of 90 or greater) on the Primary Test of Nonverbal Intelligence (PTONI; Ehrler & McGhee, 2008).

Children were randomly assigned to one of three groups using block randomization: Spanish-English intervention (SEI) (14), English-only intervention (EI) (14), and a control group that received no intervention (15). Subjects were entered into each group until two groups of 15 children and one group of 14 children were established. One child withdrew after the first week of intervention, leaving one group of 15 and two groups of 14 children. Univariate analysis of variance (ANOVAs) demonstrated no statistically significant differences between the ages of the children in the three groups F (2,40) = .758, p = .475, η² = .037. Table 1 contains the classroom and group distribution of children.

Parents completed a questionnaire to obtain demographic information including languages used at home and the child’s language proficiency in the language(s) used at home. Demographic information can be found in Table 2. No significant differences for demographic data were found between groups. Table 3 contains information related to language used at home and the child’s language proficiency among family members.
Procedure

The researcher contacted the parents via telephone and invited them to meet in a private room at the research site. In this meeting, the study was explained (in Spanish or English) with parental consent provided in Spanish and English. If the parent agreed to participate by telephone, the parent had the option of meeting in person with the PI to complete the written consent and the questionnaires for obtaining demographic information and languages used at home or the consent and questionnaires were sent home with the child to be completed, signed and returned. The PTONI was administered to each child individually in a quiet room at the Head Start center two weeks prior to initiation of the intervention. After participants met the inclusion criteria, they were randomly assigned to one of three conditions as explained previously.

Research design. Two groups received intervention to increase vocabulary. Twenty-four (24) words were targeted over six weeks (four new words per week). Children in the SEI group were taught the words in Spanish and English. Children in the EI group were taught the same words in English only. The control group received no intervention. The children’s ability to name photographs of all of the words and to define the words was tested before the intervention began (pretest), after the six weeks of intervention (posttest), and six weeks following the posttest (follow-up). ANOVAs demonstrated no statistically significant differences between the pretest scores of the children in the three groups F(2,40) = .209, p= .812, η² = .010.

Selection of Target Words

Target words were selected based on the following criteria: (a) All target words occur in the intervention book (image or text). (b) The research team (6 people) agreed that the words are Tier 2 vocabulary for preschoolers 3- to 5 years-old. The research team was composed of one
English-Spanish bilingual doctoral candidate with research and clinical experience in bilingual language and literacy intervention, four professors from the Department Communication Sciences and Disorders with research and clinical expertise and experience in language and literacy, and one professor from the department of Education with research, expertise and experience in language and literacy. Tier 2 words are words that are primarily learned in school and are important in order to understand school text (Beck, McKeown, & Kucan, 2002). (c) All words have translated equivalents in Spanish and English. (d) All words can be pictured, and the research team agreed that the selected photograph will elicit the target word (Cycowicz, Friedman, Rothstein, & Snodgrass, 1997). Six books were selected for the book reading based on interest to preschool children and presence of appropriate words for target vocabulary. Books selected in this research met the Hargrave and Senechel’s (2000) criteria. The books contained colorful illustrations, were not excessively long, were of narrative genre, were appropriate for the age range, and the targets appeared in the text and/or images in the book. One children’s book was selected for each week of intervention: Stuck (Jeffers, 2011), Pete the Cat and the New Guy (Dean & Dean, 2014), No David (Shanon, 1998), The Pigeon Needs a Bath (Willems, 2014), Mrs. McNosh Hangs Up Her Wash (Weeks, 1998), The Three Little Pigs (Goldman, 1996). Four target words (two nouns and two verbs) were selected per week/book for the English intervention group, and the respective Spanish translation equivalents were selected for the Spanish/English intervention group. Appendix A contains a list of the books and the vocabulary selected for each book. Similar vocabulary studies selected four to five target words per intervention week (Lugo-Neris et al., 2010; Leacox & Jackson 2012).
Testing of Target Words

In order to examine acquisition of expressive vocabulary in English and Spanish as a result of the intervention, an instrument to measure the children’s naming and definition of the target words at pretest, posttest, and follow-up was designed. The test included colored photographs representing each of the 24 target words. The fidelity of the translation of the vocabulary test from English to Spanish was reviewed by two bilingual (English-Spanish) researchers. Cronbach’s alphas were calculated to estimate internal consistency of the probe items. Good consistency was found for English naming (.83) and Spanish naming (.71) at pretest. There were no correct responses for English and Spanish definition at pretest. Four members of the research team reviewed the photographs in relationship to the Spanish and English words and agreed that the images are representative of the concepts. In addition, six school age children (7- to 10 years-old) correctly identified all words from the pictures to validate the picture representations.

Each child was invited to participate individually in one session lasting approximately 45 minutes in a quiet separate classroom in the Head Start center. The complete naming and definition task was administered in one language and then the other. The presentation of the language (English or Spanish first) was counterbalanced. Instructions were provided in Spanish. Color photographs of the target vocabulary were presented on a laptop computer. The order of pictures was randomized across presentations. The children were asked to label the picture using the language being assessed (Spanish or English) (i.e. “¿Qué es eso?” “What is this?”,”¿Qué está haciendo él?” “What is he doing?”). The examiner asked the child using Spanish or English to name the photograph in that language. If the child did not respond to the naming request, the question was asked again. If the child did not provide a response to the second request, feedback
THE USE OF TEXT-TO-SPEECH TO TEACH VOCABULARY

(i.e. using neutral terms “You are working hard.”) was provided and the next item was tested. Once the child was tested in one language, the examiner examined the other language following the same procedures. The child received a score of 1 for correctly naming the target word and 0 for an incorrect or no response. If the child labeled the photograph correctly, the child was then asked to provide a definition of the word. Definition was not requested if the child did not name the word. The examiner asked the child to provide a definition by saying “Puedes decir algo de esto?” or “Can you tell me something about this?” (Justice, Meier, & Walpole 2005; Lugo-Neris et al., 2010). If the child provided one descriptor or attribute, the definition was scored as 1 point; no definition or unrelated descriptors or attributes scored 0 points (Appendix B contains the scoring table). A similar method of measuring definitions has been used in related research with monolingual and bilingual preschoolers (Bedore, Peña, García, & Cortex, 2005; Justice et al., 2005; Lugo-Neris, et al., 2010; Leacox & Jackson, 2012).

Intervention

Both experimental groups received vocabulary instruction two days per week for 35 minutes each session during a period of six weeks. Children in both groups started and ended the intervention on the same day. Children were invited to a quiet room prepared for the vocabulary intervention at the Head Start center. The intervention for the EI and SEI groups addressed vocabulary learning through a shared book reading activity. English monolingual clinicians used the same instructional strategies with English as the language of instruction in both groups. The target words were presented by the clinician in English for the EI and SEI groups; however, intervention for the SEI group also included supplemental presentation of the target words and definitions in Spanish using a text-to-speech translator for each target word.

The intervention session included four steps: introduction, vocabulary explanation, book
reading, and individual activities (See Appendix C for instructional format). The introduction, vocabulary explanation, and book reading were provided in groups of three to four children. The introduction included an overview of the session activities described in English (e.g., Today we are going to learn some words, read a book, and create a picture book.). The vocabulary explanation consisted of the introduction of each word combined with a paper photograph (8.5' X 11'), photograph, followed by a child friendly definition of the word. The paper photograph to represent the word was different from the pictures in the book and from the pictures on the target word list used for testing vocabulary learning, which were presented on a laptop. The children were asked to repeat the target word in unison and listen to the word definition. If a child did not repeat the target word in unison, the teacher proceeded with the activity. The SEI and EI groups repeated the target word after listening to the English word provided by the clinician and then listened to the definition provided by the clinician in English. The SEI group also listened to the target word in Spanish using the TTS program with a tablet. Children repeated the target word in unison in Spanish after listening to the Spanish word and then listened to the definition in Spanish via the TTS program. The presentation of the English and Spanish words for the SEI group were counterbalanced across sessions.

Following the vocabulary presentation, the clinician read the book with the children. Target words appeared four times in a sentence or phrase during the book reading. Because some of the words did not appear four times in the book, the script was adapted to include additional use of those words in context to assure equal number of presentations of each word. Each target word appeared four times during clinician’s script for the book reading. For the EI group the clinician read the book and followed the script in English, emphasizing the target words in context. For the SEI group, when the target vocabulary words appeared in the book or
script, the children also heard the word used in the same sentence translated to Spanish by the TTS program. Only sentences that included the target words were translated with the TTS program.

In order to prevent variable exposure to the target words, the final part of the intervention session elicited expressive responses from each child individually without other children present. In this individual activity, the clinician engaged the children individually in an activity to elicit naming and definition of the target words. The first day of each week of intervention, each child placed the paper photograph of each target word on a vocabulary chart and named the paper photograph. These paper photographs were different than the images that appear in the storybook. After each paper photograph was placed on the chart, the child was asked to name all of the photographs. On the second day of each week, each child created a picture book with the photographs of the target words and was asked to name each photograph one time as they pasted it into the book. The clinician then stated the correct name and asked the child to repeat. When the book was completed, the clinician asked the child to write or draw something about each picture. The clinician then asked the child, “Tell me what you know about the picture”. The clinician gave the child-friendly definition and asked the child to repeat. After being asked to name and define the picture in English, children in the SEI group, were immediately asked to name and define the picture in Spanish in the same way. After being asked to provide their answers in Spanish, every child listened to the word or definition via the TTS program and then was asked to repeat the answer in Spanish. Children received positive feedback for all answers (i.e. using neutral terms “You’re such a good listener”). The language of the activities was counterbalanced for the SEI group across sessions.

**Technical specifications used for the SEI.** A free online text-to-speech translator
program (Bing translator) was used with a tablet computer (Window RT Surface) and two omnidirectional speakers (Logitech's Z-5) to produce words and definitions in Spanish for the SEI group. The computer program was not used for the EI group as the intervention for the EI group was presented in English-only.

Training

**Research assistants.** Five Spanish-English bilingual undergraduate and graduate students in speech language pathology administered and scored the pretest, posttest and follow-up measures with the supervision of the principal investigator (PI), who is an ASHA certified bilingual Spanish-English SLP. The examiners were blind to the participants’ group assignment. All examiners were trained by the PI during one week prior to initiation of the research. Training consisted of written and spoken explanation of the protocol, video clips of the PI administering the assessment protocol, and repeated practice of test administration. The students practiced giving the test to adults until they were 100% accurate in administration and scoring.

**Intervention assistants.** The intervention agents were two monolingual (English-speaking) first year graduate clinicians. The PI monitored, and assured consistency during intervention. Training for the intervention agents included demonstration of all components of the session, including introduction, vocabulary explanation, book reading, and individual activities, video clips of the PI providing the intervention, written intervention scripts, spoken explanation, and practice of the intervention protocol. A script describing each step of the intervention, questions, and ways to elicit vocabulary were practiced and discussed among the research assistants and PI. Any questions from the research assistants were answered before and after each intervention. To determine adherence to the intervention protocol, all 96 sessions were recorded; 32 videos of the interventions were examined by the PI and clinicians to ensure
the intervention protocol and script were followed in all sessions. The PI observed 33% of the intervention sessions and provided corrective feedback after each observation.

**Fidelity and Reliability**

A protocol checklist was developed to document fidelity that every step of the vocabulary intervention was followed. Twenty (20) of the 96 sessions (20%) were randomly selected and scored for accuracy of the intervention by two trained graduate clinicians who were not involved in the intervention. Adherence to the protocol included: the four parts of the vocabulary intervention: introduction, vocabulary explanation, book reading, and the individual activities; number of times each target was repeated by the clinician in the vocabulary explanation, book reading, and individual activities. Adherence to the protocol was accurate 100% of the time during the randomly selected sessions.

To determine if scoring of the vocabulary test in Spanish and English was consistent across examiners, 10% of the pretests were randomly selected for analysis. Two examiners scored the tests individually while examining the same child. Percentage of agreement for naming was 98% and for definition was 92%.

**Results**

This research examined the effectiveness of using L1 (Spanish) with text to speech technology by an English monolingual speaker to facilitate the acquisition of vocabulary naming and definition in Spanish and English. Pretest scores for naming and defining the target vocabulary in English and Spanish were compared to scores at posttest and follow up for the SEI, EI and control groups. Table 4 presents pretest, posttest, and follow up mean scores of each group.
A logistic regression model was used to measure changes in naming and definition of target vocabulary in English and Spanish (Jaeger, 2008). Since the scores represented a dichotomous variable (correct or incorrect response), a binominal logistic regression model was used to evaluate the effect of the intervention on vocabulary learning (Baayen, Davidson, & Bates, 2008; Jaeger, 2008). This model allowed us to investigate the effect of intervention on vocabulary acquisition in the two languages and on two vocabulary measures (naming and definition) during three time periods. With this model, we can relate each predictor variable to the dependent variables and predict the effect on vocabulary naming and definition in relationship to the intervention conditions.

Forty-three (43) children were asked to name 24 words and definitions in Spanish and 24 words and definitions in English at pretest, posttest, and follow up. This yielded a dataset of 12,384 responses for all tests administrated. Each answer was entered into the interactive program R Studio (version 2.1), and the lmer (Bates & Sarkar, 2005) function was used to run the logistic model to examine the effect of intervention on naming and definition. Positive β-coefficient represents a better performance in that condition as compared to the other conditions. The P values of the β-coefficients were indicators of whether this coefficient was significantly different than 0. Odds ratio (OR) were obtained by calculating the exponential of the coefficient. It is more likely that children demonstrated gains in the condition of interest if the OR is larger than 1. This model has been used as a substitute for ANOVA in similar research for lexical and L2 learning (i.e. Elgort, 2013; Guo, Owen, & Tomblin, 2010).

**Research Question 1: English Naming and Definition**

Comparison of pretest and posttest scores revealed significantly greater gains in English naming for the SEI (β= 3.636, SE=.568, z = 6.395, OR = 37.94, p  < .001) and EI (β= 3.078,
Comparison of pretest and posttest scores revealed significantly greater gains in expressive definition of English words for the SEI group when compared to the Control group (β = 4.098, SE = 1.449, z = 2.828, OR = 60.22, p = < .01). No significant differences in gains were found between the SEI and EI (β = -1.639, SE = 1.175, z = -1.394, OR = 0.19, p = 1) groups or between the EI and Control (β = 2.459, SE = 1.447, z = 1.700, OR = 0.09, p = 0.1) groups.

Follow up English naming scores indicated that gains were maintained after six weeks of intervention for both SEI (β = 3.231, SEI = .607, OR = 25.30, z = 5.323, p = < .001) and EI (β = 2.999 SEI = .607, z = 4.931, OR = 20.07, p = < .001) groups when compared to the Control group. In addition, gains in English expressive definition for the SEI group were maintained when compared to the Control group (β = 3.178, SE = 1.423, z = 2.333, OR = 23.99, p = < .05). There was no significant difference between maintained gains in English definition of the EI and Control groups (β = 1.333, SE = 1.450, z = 0.26, OR = 1.00, p = 1) and of the SEI and IE (β = -1.844, SE = 1.368, z = -1.349, OR = 0.158 p = 1) group. Figure 1 shows the English naming mean scores at pretest, posttest, and follow-up for the Spanish-English intervention, English-Only intervention, and control groups. Figure 2 shows the English definition mean scores at pretest, posttest, and follow-up for the Spanish-English Intervention, English-Only Intervention, and Control Groups.

Research Question 2: Spanish Naming and Definition

Comparison of pretest and posttest scores revealed significantly greater gains in Spanish naming for the SEI group when compared to the EI (β = 3.340, SE = .462, OR = 28.22, z = -7.217,
The use of text-to-speech to teach vocabulary

Comparison of pretest and posttest scores revealed significantly greater gains in expressive definition of Spanish words for the SEI group when compared to the EI (β= 2.830, SEI= 1.076, z = 2.631, OR=16.95, p= < .01) and Control (β= 3.589, SE= 1.18, z= 3.020, OR= 36.20, p = < .01) groups. No significant difference was found between the scores of the EI and Control groups (β= 0.7584, SE= 1.296, z = 0.585, OR= 2.13, p = 1).

Follow up English naming scores indicated that gains were maintained after six weeks of intervention for the SEI group when compared to the EI (β= 2.201, SE= .403, z = -5.46, OR= 9.03, p = < .001) and Control (β= 3.085, SE= .470, z = -6.566, OR= 21.87, p = < .001) groups. In addition, gains in Spanish expressive definition for the SEI group were maintained when compared to the EI (β= 3.117, SE= 1.395, z = -2.234, OR= 22.58, p = < .05) and Control (β= - 2.717, SE= 1.244, z = -2.184, OR=8.82, p = < .05) groups. No significant difference was found between the scores of the EI and Control groups (β= - 0.400, SE= 1.5907, z = - .252, OR= 1.49 p = 1). Figure 3 shows Spanish naming mean scores at pretest, posttest, and follow-up for the Spanish-English intervention, English-Only intervention, and control groups. Figure 4 shows the Spanish definition mean scores at pretest, posttest, and follow-up for the Spanish-English intervention, English-Only intervention, and control groups.

Discussion

This study examined the effectiveness of a vocabulary approach that included the use of supplemental Spanish by an English monolingual speaker to facilitate the acquisition of vocabulary in both languages by preschoolers who are Spanish speaking English Language
Learners (ELLs). Specifically, this study examined whether Spanish-English Intervention with the use of Text-to-Speech in Spanish facilitates the acquisition of vocabulary, as measured by naming and defining target words, in the first language (L1: Spanish) and second language (L2: English) when compared to English-only intervention and no intervention. Intervention in Spanish and English (SEI group) and in English-only (EI group) were conducted with identical vocabulary teaching strategies except that the vocabulary intervention for the SEI group included supplemental words and definitions in Spanish with the use of TTS. The clinician used TTS technology to provide the Spanish translation of the target words as well as a Spanish definition for each word.

Results showed that the SEI and EI groups both obtained greater gains in English naming when compared to the control group, but English naming gains in the SEI and EI groups were not statistically different. However, the SEI group showed greater gains in Spanish naming when compared to both the EI and control groups. These statistical differences in Spanish and English naming were maintained when follow up testing was administrated six weeks after the intervention concluded. It is considered positive when gains are maintained beyond the intervention period as this can be indicative of progress in language development (Yoder et al., 2011). In regard to word definitions, only children in the SEI showed greater gains in English definitions when compared to the control group. The EI group’s gains in English definitions were not statistically different from the control group, and there was no difference between the gains of two intervention groups. In regard to Spanish definitions, the SEI group showed greater gains when compared to both the EI and control groups. This section discusses the results related to naming in English and Spanish followed by definition in English and Spanish across the three intervention groups.
Naming

**English naming.** The gains in English naming vocabulary made by the SEI and EI groups when compared to the control group indicate that intervention using only L1 and using L1 and L2 are both effective methods of teaching vocabulary in L2. The combination of strategies used to increase English vocabulary was effective for both intervention groups. The five strategies used in this study included shared book reading (Biemiller & Boote, 2006; Kindle, 2009; Restrepo et al., 2013; Whitehurst et al., 1999), exposure to child-friendly definitions (Collins, 2005; Simón-Cereijido et al., 2013; Lugo-Neris et al., 2010), repeated vocabulary (Biemiller & Boote, 2006; Ukrainetz, 2006), and the use of multiple modalities (Simón-Cereijido et al., 2013; Méndez et al, 2015) to support English naming. The similarity in English naming gains of the SEI and EI groups suggests that using a bilingual approach does not negatively impact the acquisition of English naming in ELLs when compared to an English-only approach (Barnett et al., 2007; Lindholm-Leary, 2014; Restrepo et al., 2013; Rodriguez & Tamis-LeMonda, 2011; Thordardottir, Weismer, & Smith, 1997; Winsler, Díaz, Espinosa, & Rodríguez, 1999).

These results are different from research that suggested the use of a bilingual approach accelerated the acquisition of English words in comparison to an English-only approach (Kiernan & Swisher, 1990; Méndez et al., 2015; Perozzi & Sanchez, 1992). There are two factors that may explain why the English naming gains were similar for the SEI and EI groups in this study: prior knowledge of words in L1 leading to acquisition in L2, and the order of language of presentation during each session. First, research has suggested that prior knowledge of vocabulary in L1 is important for the acquisition of L2 (Conrad, Gong, Sipp, & Wright, 2004; Goodrich, Lonigan, & Farver, 2013). The words selected in this research were words that
preschool children commonly do not know in either language because one purpose was to
determine if children were able to learn new Spanish words with the use of TTS. Low frequency
(Tier 2) words were selected to diminish exposure to the Spanish word at home. The selection of
more mature and sophisticated vocabulary might reduce the opportunity to increase learning of
the words by exposure to them in other contexts outside the intervention. The fact that the
children did not know and were not exposed to the words in Spanish might have affected
acquisition of words in English because the children did not have an already existing knowledge
of the word in L1 to make a bridge to L2. Second, the order of language presentation may play
an important role in a bilingual approach. Intervention research has typically compared a
paradigm in which all targets are taught in L1 prior to presenting targets in L2 (Kroll & Stewart,
1994; Simón-Cereijido et al., 2013). Our research used a combined approach in which the
vocabulary was taught in both languages within each intervention session. Order of language
presentation is an important factor for making a bridge from the Spanish label to the English
label (Kroll & Stewart, 1994). Many bilingual approaches for vocabulary
instruction/intervention present vocabulary first in one session in L1 followed by a second
session targeting the same words in L2 (Lugo-Neris et al., 2010; Méndez et al., 2015; Restrepo et
al., 2010; Simón-Cereijido et al., 2013). In contrast to these studies, the current study presented
Spanish and English words in the same session because the English speaking clinician could not
provide Spanish-only intervention. Although previous research has suggested that there is
greater learning in L2 when L1 is presented first, in our study children learned new words in L2
when they had no prior knowledge of the word in L1.

Spanish naming. The increase in Spanish vocabulary naming by the SEI group in
comparison to the EI group and the control suggests the efficacy of this approach to promote
vocabulary in L1 while increasing vocabulary in L2. These findings contribute to previous research that suggests the advantage of bilingual approaches to increase Spanish naming (Farver, et al., 2009; Lindholm-Leary, 2014; Restrepo et al., 2010; Restrepo et al., 2013; Schwartz, 2014). Whereas previous bilingual approaches have sequenced Spanish first and English second, it is noteworthy that this study, which combined simultaneous Spanish and English intervention conducted by a monolingual clinician had a similar influence on Spanish vocabulary acquisition and English vocabulary, with a mean of eight words learned in Spanish and nine words learned in English.

As expected, children in the EI group demonstrated limited acquisition of Spanish naming vocabulary when compared to the SEI group. These results add to the corpus of evidence that indicates that without formal instruction or exposure to L1, vocabulary growth in L1 will be restricted at school (Castilla, Restrepo, & Perez, 2009; Gutierrez-Clellen, 1999; Schaerlaekens, Zink, & Verheyden, 1995; Simon-Cerejeido & Gutierrez-Clellen, 2013). This restricted growth in Spanish vocabulary can also interfere with family dynamics because parents may not be able to communicate with their children around more sophisticated academic school language (Anderson, 1999). Further when families feel that L1 is not supported at school, they may reduce their use of L1 at home (especially when talking about school), thus further reducing the child’s L1 and access to their parent’s “best teaching language” (because they are better Spanish language users). Limited acquisition of L1 vocabulary has been reported in previous work where English-only instruction was used (i.e. Castilla et al., 2009; Schaerlaekens et al., 1995; Simón-Cerejeido et al., 2013).
Definition

**English definition.** Only the SEI group demonstrated significant gains in English definitions when compared to the control group. This finding suggests that the use of TTS and supplemental vocabulary in Spanish also promotes vocabulary definitions in English. Gains in English definitions can be partly explained by the simplicity of the definitions presented to the children in L1 and L2. This definition strategy was used to facilitate the use of new words (Beck et al., 2002) because previous research has recommended the use of child friendly definitions to increase new vocabulary (Collins, 2005; Hickman, et al., 2004; Lugo-Neris et al., 2010; Penno et al., 2002; Silverman & Hines, 2009). All definitions presented to the children included simple language that children would be expected to know and understand in their L1. This prior understanding of the vocabulary and language used in the simple definition in L1 may have served as a scaffold for the acquisition of new English definitions. Gains in definitions with this bilingual approach suggest that prior knowledge of the words used in the definition in L1 is an important factor that may influence learning new words in L2. By using children’s L1 in teaching simple definitions of the word, children can have better opportunities to learn new definitions in L2. Children in the SEI group could use their newly learned child-friendly definition in Spanish to facilitate access to the new definitions in English.

This finding supports the cross-linguistic theories in which the L1 is used to facilitate acquisition of L2 (Cummins, 1991; Farver et al., 2009; Goodrich et al., 2013; Kroll & Steward, 1994). Simple definitions in L1 may be a facilitator for the understanding of novel words as children use these new definitions to create semantic maps and relationships between words that can facilitate learning of the L2 definition (Cummins, 1991). Similar findings of gains in English definitions were found by Lugo-Neris and colleagues (2010). She described how
children who were exposed to definitions in Spanish and English were able to improve the ability to define words in English better than those who were exposed to English only definitions. Other research has also found the advantages of using L1 to promote the acquisition of L2 (Farver et al., 2009; Kiernan & Swisher, 1990; Méndez et al., 2015; Perozzi & Sanchez, 1992).

**Spanish definition.** It is not surprising that the SEI group showed significantly greater gains in Spanish definitions when compared to the EI and control groups. However, it is interesting the preschoolers were able to comprehend and remember the definitions to demonstrate an expressive understanding of the meaning of the new words in L1 when these definitions were provided only by the computer voice. It is noteworthy that Spanish definition instruction was effective in increasing definitions in Spanish even when the instruction was supplementary to the English vocabulary instruction and produced through the use of TTS by a monolingual English clinician. This finding may suggest that children who are exposed to L1 in this way can make gains in L1 vocabulary knowledge even when they have only a short period of exposure (Leacox & Jackson, 2012; Marulis & Neuman, 2010). The use of TTS by a monolingual English clinician within the context of shared book reading further suggests that at least limited academic language learning may be possible using this method. This finding, which supports the use of technology such as TTS to increase Spanish vocabulary, can be adapted to other linguistic groups when the teacher does not speak the language of the child. In addition, this result suggests that the use of audio technology (TTS) can be used to teach young children in preschool. This finding adds evidence for the use of technology to support the language of home (Leacox & Jackson, 2012).

In summary, children who participated in the SEI approach outperformed the other groups in naming and definition in Spanish, and were the only group that outperformed the
control group in defining English words. Prior knowledge of words in L1 can be taken into consideration as a strategy to scaffold acquisition of new vocabulary in L2. The use of technology such as TTS can be an appropriate instrument to increase expressive vocabulary naming and definition in both languages for professionals with limited knowledge of a language spoken by ELL children in their homes. Use of this approach with inclusion of TTS can support children’s learning of L2 while increasing their vocabulary in L1 in order to maintain cultural communicative interactions with family members. In contrast, the English-only approach was effective only in promoting expressive vocabulary in English, particularly naming. Children who are ELLs may not benefit substantially since this approach does not promote their L1, and gains in English definition were limited. These outcomes also suggest that vocabulary in one language is not automatically transferred to another without appropriate exposure (Collins, 2010).

Limitations and Future Research

Our small sample size and the specificity of the target population may not allow for generalization of our findings to the entire Hispanic population that is learning English as L2. Our sample included children from only one urban Head Start program in Midwest, and most of the population is from Guatemala. Another limitation in regard to generalization to classroom instruction is that this instruction was provided outside the classroom in small groups. This model may differ from the way a SLP or especially a teacher might teach vocabulary. However, a similar group size has been used to measure vocabulary gain in previous research (Lugo-Neris et al., 2010; Méndez et al., 2015). Our findings are limited to naming and defining of target words taught in Spanish and English by an SLP in a small group. Generalization of knowledge
of the target words, including naming and defining in other environments such as home or classroom, is an important factor to examine in future research.

A concern is that machine translator technology is not completely reliable because the program may produce grammatically incorrect translations. In this study translation was verified by a bilingual SLP. The use of the online translator was used solely for the voice component that provides the TTS application to read the sentences and words in Spanish. Future research should examine the accuracy of the available translation programs, especially as they relate to appropriate vocabulary and definitions for children that will result in functional outcomes of the use of TTS.

Clinical Implications

The benefits of a bilingual approach for children who are learning two languages have been suggested in a number of studies (Lugo Neris et al., 2010; Méndez et al., 2015; Restrepo et al., 2013). However, the number of bilingual professionals working in schools and clinical settings is limited, and thus children may not have access to bilingual teaching approaches that target their L1 and L2 language needs. This research employed the use of text-to-speech with supplemental Spanish to address the limitations of monolingual clinicians and teachers in teaching vocabulary in Spanish and English. The use of TTS with supplemental Spanish vocabulary can be used by SLPs and educators as a tool to facilitate Spanish and English expressive vocabulary.

Findings from this research suggest that children can learn expressive vocabulary in Spanish with the use of TTS during an authentic book reading experience, even when the clinician does not speak Spanish. Gains in naming and definition of vocabulary in English and Spanish observed in the group that used the TTS with supplemental vocabulary suggest that this
approach can be used by monolingual clinicians to teach target vocabulary in Spanish and English. Gains in English definitions by the group that received this approach, suggested that children were able to draw from their new L1 knowledge to learn L2 definitions. This finding suggests that this intervention supported by TTS increased the acquisition of both English and Spanish languages and also suggests that this approach can allow monolingual teachers and clinicians to address the vocabulary gap between ELLs and their monolingual peers in both languages.
Table 1

Distribution of children by classroom and intervention group.

<table>
<thead>
<tr>
<th>Classroom</th>
<th>Total, (n=48)</th>
<th>EI, (n=14)</th>
<th>SEI, (n=14)</th>
<th>Control (n=15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classroom 1</td>
<td>7</td>
<td>5</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Classroom 2</td>
<td>7</td>
<td>1</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Classroom 3</td>
<td>10</td>
<td>4</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
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<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Classroom 5</td>
<td>6</td>
<td>2</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Classroom 6</td>
<td>11</td>
<td>2</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

*Note.* EI = English-only intervention group; SEI = Spanish English Group;
Table 2

Family Characteristics and Language Spoken at Home

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Total, % (n=43)</th>
<th>EI, % (n=14)</th>
<th>SEI, % (n=14)</th>
<th>Control % (n=15)</th>
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<tbody>
<tr>
<td>Origin country of the parents</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mexico</td>
<td>4.7</td>
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<td>7.1</td>
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<tr>
<td>Guatemala</td>
<td>86.0</td>
<td>85.7</td>
<td>92.9</td>
<td>80.0</td>
</tr>
<tr>
<td>Honduras</td>
<td>2.3</td>
<td>7.1</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>NR</td>
<td>7.0</td>
<td>0.0</td>
<td>0.0</td>
<td>20.0</td>
</tr>
<tr>
<td>Parent level of education</td>
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<td>Elementary School</td>
<td>32.6</td>
<td>50.0</td>
<td>28.6</td>
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<tr>
<td>Intermediate</td>
<td>44.2</td>
<td>35.7</td>
<td>35.7</td>
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<tr>
<td>High School</td>
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<td>University</td>
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<td>14.3</td>
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<td>Primary Language spoken</td>
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<td>Spanish</td>
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<tr>
<td>Maternal Language</td>
<td></td>
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<td>Spanish</td>
<td>81.4</td>
<td>85.7</td>
<td>85.7</td>
<td>73.3</td>
</tr>
<tr>
<td>Spanish and English</td>
<td>11.6</td>
<td>14.3</td>
<td>14.3</td>
<td>6.7</td>
</tr>
<tr>
<td>NR</td>
<td>7.0</td>
<td>0.0</td>
<td>0.0</td>
<td>20.0</td>
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<tr>
<td>Paternal language</td>
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<tr>
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<td>78.6</td>
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<tr>
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<td>21.4</td>
<td>20.0</td>
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<tr>
<td>Additional Language used at home</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Mam</td>
<td>20.9</td>
<td>35.7</td>
<td>14.3</td>
<td>13.3</td>
</tr>
</tbody>
</table>

*Note. EI = English-only intervention group; SEI= Spanish English Group; NR= Parent did not respond.*
Table 3

Parents’ Report of Language(s) Used and Child’s Language Proficiency at Home

<table>
<thead>
<tr>
<th>Parent reports of use and proficiency of their children’s language.</th>
<th>Total, % (n=43)</th>
<th>EI, % (n=14)</th>
<th>SEI, % (n=14)</th>
<th>Control, % (n=15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spanish used at home.</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Sometimes</td>
<td>14.0</td>
<td>14.3</td>
<td>14.3</td>
<td>13.3</td>
</tr>
<tr>
<td>Most of the time</td>
<td>79.1</td>
<td>78.6</td>
<td>85.7</td>
<td>73.3</td>
</tr>
<tr>
<td>NR</td>
<td>7.0</td>
<td>7.1</td>
<td>0.0</td>
<td>13.3</td>
</tr>
<tr>
<td>English used at home.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>4.7</td>
<td>0.0</td>
<td>7.1</td>
<td>6.7</td>
</tr>
<tr>
<td>Sometimes</td>
<td>76.7</td>
<td>78.6</td>
<td>85.7</td>
<td>66.7</td>
</tr>
<tr>
<td>Most of the time</td>
<td>9.3</td>
<td>14.3</td>
<td>7.1</td>
<td>6.7</td>
</tr>
<tr>
<td>NR</td>
<td>9.3</td>
<td>7.1</td>
<td>0.0</td>
<td>20.0</td>
</tr>
<tr>
<td>Mam used at home.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>65.1</td>
<td>50.0</td>
<td>85.7</td>
<td>60.0</td>
</tr>
<tr>
<td>Sometimes</td>
<td>14.0</td>
<td>28.6</td>
<td>14.3</td>
<td>0.0</td>
</tr>
<tr>
<td>Most of the time</td>
<td>14.0</td>
<td>14.3</td>
<td>0.0</td>
<td>26.7</td>
</tr>
<tr>
<td>NR</td>
<td>7.0</td>
<td>7.1</td>
<td>0.0</td>
<td>13.3</td>
</tr>
<tr>
<td>How well child speaks Spanish.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Used few words or phrases</td>
<td>2.3</td>
<td>7.1</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Speak the language with errors.</td>
<td>11.6</td>
<td>7.1</td>
<td>0.0</td>
<td>26.7</td>
</tr>
<tr>
<td>Speak the language with no errors.</td>
<td>76.7</td>
<td>78.6</td>
<td>92.9</td>
<td>60.0</td>
</tr>
<tr>
<td>NR</td>
<td>9.3</td>
<td>7.1</td>
<td>7.1</td>
<td>13.3</td>
</tr>
<tr>
<td>How well child speaks English</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Used few words or phrases</td>
<td>53.5</td>
<td>35.7</td>
<td>35.7</td>
<td>86.7</td>
</tr>
<tr>
<td>Speak the language with errors.</td>
<td>27.9</td>
<td>50.0</td>
<td>35.7</td>
<td>0.0</td>
</tr>
<tr>
<td>Speak the language with no errors.</td>
<td>9.3</td>
<td>7.1</td>
<td>21.4</td>
<td>0.0</td>
</tr>
<tr>
<td>NR</td>
<td>9.3</td>
<td>7.1</td>
<td>7.1</td>
<td>13.3</td>
</tr>
<tr>
<td>How well child speaks Mam</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do not uses the language</td>
<td>72.1</td>
<td>50.0</td>
<td>100.0</td>
<td>66.7</td>
</tr>
<tr>
<td>Speak the language with errors.</td>
<td>11.6</td>
<td>28.6</td>
<td>0.0</td>
<td>6.7</td>
</tr>
<tr>
<td>Speak the language with no errors.</td>
<td>9.3</td>
<td>14.3</td>
<td>0.0</td>
<td>13.3</td>
</tr>
<tr>
<td>NR</td>
<td>7.0</td>
<td>7.1</td>
<td>0.0</td>
<td>13.3</td>
</tr>
</tbody>
</table>

Note. EI = English-only intervention group; SEI= Spanish English Group; NR= Parent did not respond.
Table 4

Pretest, Posttest, and Follow Up Mean Scores and Standard Deviations for English and Spanish Vocabulary Naming and English and Spanish Definitions for the Spanish-English Intervention, English-Only Intervention, and Control Groups

<table>
<thead>
<tr>
<th>Dependent Measure</th>
<th>Spanish-English Intervention (n=14)</th>
<th>English-only Intervention (n=14)</th>
<th>Control group (n=15)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pretest M (SD)</td>
<td>Posttest M (SD)</td>
<td>Follow up M (SD)</td>
</tr>
<tr>
<td>English Naming</td>
<td>1 (1.79)</td>
<td>10.14 (6.27)</td>
<td>7.42 (5.45)</td>
</tr>
<tr>
<td>Spanish Naming</td>
<td>1.64 (1.73)</td>
<td>9.57 (4.79)</td>
<td>6.21 (4.22)</td>
</tr>
<tr>
<td>English Definition</td>
<td>0 (0)</td>
<td>3.43 (4.11)</td>
<td>2.36 (3.25)</td>
</tr>
<tr>
<td>Spanish Definition</td>
<td>0 (0)</td>
<td>3.43 (3.99)</td>
<td>1.36 (2.47)</td>
</tr>
</tbody>
</table>
Figure 1. English naming pretest, posttest, and follow-up mean scores for the Spanish-English intervention, English-Only intervention, and control groups.
Figure 2. English definition pretest, posttest, and follow-up mean scores for the Spanish-English intervention, English-Only intervention, and control groups.
Figure 3. Spanish naming pretest, posttest, and follow-up mean scores for the Spanish-English intervention, English-Only intervention, and Control groups.
Figure 4. Spanish definition Pretest, Posttest, and Follow Up Mean Scores for the Spanish-English Intervention, English-Only Intervention, and Control Groups.
Appendix A

List of Books and Target Words Taught in Each Language

<table>
<thead>
<tr>
<th>Book used each week.</th>
<th>Vocabulary in English</th>
<th>Vocabulary in Spanish</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>flinging</td>
<td>columpiando, lanzando</td>
</tr>
<tr>
<td>Dean, J., &amp; Dean K. (2015). *Pete the</td>
<td>squirrel, owl, juggling,</td>
<td>ardilla, buho, malabares,</td>
</tr>
<tr>
<td>Cat and the New Guy*. HarperCollins.</td>
<td>climb</td>
<td>trepando</td>
</tr>
<tr>
<td>Scholastic Inc.</td>
<td>reaching, splashing</td>
<td>salpicando</td>
</tr>
<tr>
<td>Willems (2014). *The Pigeon Needs a</td>
<td>pigeon, fly, swimming,</td>
<td>paloma, mosca, nadando,</td>
</tr>
<tr>
<td>Bath!* Disney-Hyperion.</td>
<td>flapping</td>
<td>aleteando</td>
</tr>
<tr>
<td>up her wash*. Harper Collins.</td>
<td>wringing</td>
<td>restregando exprimiendo,</td>
</tr>
<tr>
<td>Pigs*. Troll Communications.</td>
<td>boiling</td>
<td>hirviendo</td>
</tr>
</tbody>
</table>

*Note.* Vocabulary words each week consisted in two nouns and two verbs for each language.
## Appendix B

### Expressive Depth (Definition) Scoring

<table>
<thead>
<tr>
<th>Point</th>
<th>Criterion</th>
<th>English examples (i.e. firefighter)</th>
<th>Spanish example (i.e. bombero)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 point</td>
<td>No response</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>No knowledge</td>
<td>Incomplete definition</td>
<td>A firefighter goes…</td>
<td>El bombero va</td>
</tr>
<tr>
<td></td>
<td>Inappropriate definition</td>
<td>A firefighter is a car</td>
<td>El bombero es un carro</td>
</tr>
<tr>
<td></td>
<td>Restatement</td>
<td>A firefighter is firefighter</td>
<td>El bombero es bombero</td>
</tr>
<tr>
<td>1 Point</td>
<td>One or two descriptor or attribute.</td>
<td>Firefighter put off fire.</td>
<td>El bombero apaga fuego.</td>
</tr>
<tr>
<td>Partial Knowledge</td>
<td>Firefighter helps people.</td>
<td>El bombero ayuda a la gente.</td>
<td></td>
</tr>
</tbody>
</table>

Note: Adapted from Justice et al. 2005; Lugo-Neris et al., 2010.
## Protocol for Vocabulary Intervention

<table>
<thead>
<tr>
<th>Day 1</th>
<th><strong>Introduction</strong></th>
<th>Explain the purpose of the session and introduce the activities.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Vocabulary Explanation</strong></td>
<td>Show each paper picture. Clinician labels the word and children repeat three times. Clinician says the child-definition.</td>
<td>Clinician uses the TTS to label the word in Spanish. Clinician and children repeat the word three times and listen the child-definition.</td>
</tr>
<tr>
<td></td>
<td><strong>Book Reading</strong></td>
<td>Clinician read the book. Emphasize the sentence that has the target word.</td>
<td>Use the TTS to translate to Spanish the sentence read in English.</td>
</tr>
<tr>
<td></td>
<td><strong>Individual Activity</strong></td>
<td>In a vocabulary chart, each child places a paper picture of each word, name each word twice, and say child-definition with a vocabulary once.</td>
<td>The child is also asks to label the words again in Spanish two times and say child-definition once. The word and definition was always given with TTS after the child’s answer.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day 2</th>
<th><strong>Introduction</strong></th>
<th>Same as day 1</th>
<th>Same as day 1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Vocabulary Explanation</strong></td>
<td>Same as day 1</td>
<td>Same as day 1</td>
</tr>
<tr>
<td></td>
<td><strong>Book Reading</strong></td>
<td>Same as day 1</td>
<td>Same as day 1</td>
</tr>
<tr>
<td></td>
<td><strong>Individual Activity</strong></td>
<td>Clinician and child create a vocabulary book with pictures. While paste a picture the child names the picture twice. Then, the clinician ask the child “write” something that he knows (definition) about the word. The clinician always gave the word and definition after child’s answer. Child take the book home.</td>
<td>After complete the book in English the child is ask to name the pictures again, but this time in Spanish two times. Then, the clinician ask the child “write” something that he knows (definition) about the word in Spanish. The word and definition was always given with TTS after the child’s answer.</td>
</tr>
</tbody>
</table>

*Note: EI = English-only intervention group; SEI= Spanish English Group.*
Chapter III.

Assertiveness and Shyness

as Predictors of Vocabulary Intervention Outcomes

for English Language Learners

Over the course of the last two decades, the demographic composition of American schools has changed significantly. In particular, the number of English Language Learners (ELLs) 5- to 17 years-old has increased significantly, reaching an estimated 4.7 million students in 2010 (Aud et al., 2010). ELLs are children who are learning English as a second language (L2), while continuing to develop their first language (L1) (Flores, 2016). A wide range of variables has been identified to explain the challenges this group faces in regard to school success. Among these are poverty; limited English proficiency, including limited vocabulary knowledge; and lack of systemic and explicit vocabulary instruction in schools (Cena et al., 2013; Shatz & Wilkinson, 2010). Another variable that may be related to difficulty in school is low assertive social skills or shyness. Assertiveness refers to the child’s confidence to interact with peers (Perkins & Hightower, 2002). In contrast, shyness is defined as the manifestation of anxiety and avoidance of social interactions (Coplan & Rubin, 2010). Children who are ELLs have been found to exhibit shyness in contexts where English is spoken (Ash, Rice, & Redmond, 2014). This may represent an additional challenge to teachers and clinicians who work to increase language in ELL children. Children who speak a language other than English at home and who are shy have been found to have lower second language receptive and expressive language competence, and slower language development in both languages than non-shy children (Keller, Troesch, & Grob, 2013; Strand, Pula, Parks, & Cerna 2011).
Vocabulary Instruction

Children in the US who are ELLs have been found to have smaller vocabularies when compared to their monolingual peers in both their first language and their second language (Mancilla-Martinez & Lesaux, 2011; Páez, Tabors, & Lopez, 2007; Umbel, Pearson, Fernandez, & Oller, 1992). One explanation for this vocabulary gap is that the vocabulary of ELLs is distributed across two languages, resulting in a smaller vocabulary when vocabulary in only one language is examined (Hammer et al., 2014). Likewise, limited English exposure at home impacts ELL’s English proficiency, and, in consequence, children do not have the language to support the meaning of new words. Unfortunately, it is only the English vocabulary that is useful in supporting communication and academic success in many schools. The additional words that the child knows in L1 may support communication at home, but does not support school success. This English language gap continues after years of English-only education (Mancilla-Martinez & Lesaux, 2011).

Many research strategies have been proposed to ameliorate the vocabulary gap between ELLs and their monolingual peers. Research has shown that shared book reading is one activity that promotes the acquisition of new vocabulary (Biemiler & Boote, 2006; Kindle, 2009; Whitehurst et al., 1999). Shared book reading can promote interaction between the adult and child around the story and the words in the story book and has been used successfully with children who are ELLs in both bilingual and monolingual vocabulary interventions (Lugo-Neris, Jackson, & Goldstein, 2010; Méndez, Crais, Castro, & Kainz, 2015; Restrepo, Morgan, & Thompson, 2013). Combining shared book reading with other vocabulary teaching strategies has been shown to result in greater gains than the vocabulary teaching strategies alone (Biemiller &
Boote, 2006; Méndez et al., 2015). Vocabulary teaching strategies that have been used during shared book reading include introducing new vocabulary before, during, and after storybook readings (Biemiller & Boote, 2006), including L1 during the reading (Lugo-Neris et al., 2010), using varied vocabulary encounters while reading, and the use of multiple modalities such as visual aids, manipulatives, gestures and activities that support the learning of words (Méndez et al, 2013; Silverman & Hines, 2009). There is limited data regarding whether these strategies benefit children who are shy in the same way that they benefit children who are not shy. Research is needed to determine if vocabulary instruction during shared book reading which is targeted to children who are ELLs is equally successful for children who are identified as shy and those who are not.

**Shyness**

Shyness has been defined as a form of social withdrawal in which social interactions become more infrequent (Keller, Trosech, & Grob, 2013). Shyness is the manifestation of anxiety and avoidance of social interactions characterized by limited participation in conversation and restrained use of language (Coplan & Rubin, 2010). Coplan and Armer (2005) explored the relationship between shyness and expressive language development in first language acquisition, noting that shyness typically results in maladjustment and the inability of children to engage in vital social interactions where expressive language capabilities are most commonly developed. Monolingual children who are shy demonstrate more limited expressive language skills (less complex narratives, fewer sentences, and fewer questions) when compared to children who are not shy (Reynolds & Evans, 2009; Crozier & Perkins, 2002). Research has shown that children who are shy are more likely to present receptive (Spere & Evans, 2009), and expressive language (Spere, Schmidt, Theall-Honey, & Martin-Chang, 2004), phonemic
awareness (Spere et al., 2004), and pragmatic language skills below their age norms (Coplan & Weeks, 2009).

Two reasons have been suggested to explain the link between language skills and shyness. First, language assessments used in research studies have been shown to increase anxiety in children, and consequently, shy children may achieve lower scores on language tests (Crozier & Hostettler, 2003). Crozier and Meier (1993) found that shy children who were recorded at home showed better language performance as compared to those who completed a language assessment administered by an unfamiliar person. A second explanation suggests that children who are shy present lower language ability because they avoid social interactions and conversations, which leads to less practice in conversation, and this loss of practice, in turn, decreases their language competence (Keller et al., 2013). This can be a critical issue at school because limited social interactions may further contribute to reduced language and academic skills since teachers and peers offer less communication support to shy children than to those who are not shy (Rudasill & Rumm-Kaufman, 2009). Although these theories attempt to explain the connection between shyness and language skills, the relationship is still not clear (Spere et al., 2004; Keller et al., 2013). However, the reality is that children who are shy underperform their peers who are not shy in receptive and expressive language tasks. If shyness is present in ELLs, who already have limited language skills in L2, it may be an additional factor that could impact their learning of the new language.

**Shyness and Language Development in ELLs**

Preston (2014) indicates that there are a number of components of second language acquisition that are being overlooked in attempts to understand the process and the factors related to second language acquisition. Some second language developmental theories suggest that
children in the early stages of typical second language development enter a stage where expressive communication is limited while they are acquiring sufficient second language competence to communicate. This stage is called the nonverbal period (Tabors, 1997) or silent period. In addition to limited expressive communication, children who are in this stage have been described as showing characteristics like private speech, limited eye contact while speaking, limited response to questions, and turning away when the teacher addresses them in the classroom (Saville-Troike, 1988). Characteristics found in the silent period stage may also be presented by children who are shy. For example, children who are shy demonstrate withdrawal and use fewer words, and less speech in school and in unfamiliar situations (Asendorpf & Meier, 1993; Reynolds & Evans, 2009).

It is not clear in the literature whether a silent period related to second language learning best characterizes ELLs who demonstrate limited expressive communication or whether some ELL children are shy without regard to their language status. A silent period may co-occur with shyness; however, Roberts (2014), analyzed the extent and quality of research evidence regarding the silent period as a typical component of second language development. Only twelve studies were found to meet the research inclusion criteria. Roberts (2014) found a lack of consistent theoretical clarity and definition of a silent period and limited evidence to support this stage as part of typical second language development in ELLs. The lack of evidence for this stage in the typical second language development of ELLs draws attention to behaviors such as shyness that may impact ELLs’ ability to learn vocabulary in the classroom.

A social disorder frequently observed in ELLs is selective mutism. Selective mutism is characterized by failure to speak in one setting while being able to speak in others (DSM-5). ELLs have been identified as having a higher rate of selective mutism than monolingual
children. Prevalence reports in Canada, Switzerland, Germany, and Israel have found higher rates of selective mutism in immigrant children than nonimmigrant children (Toppelberg, Tabors, Coggins, Lum, & Burger, 2005). Selective mutism can be differentiated from the silent period as mutism is prolonged and presented in both languages (Preston, 2014; Toppelberg, Tabors, Coggins, Lum, & Burger, 2005).

It has been proposed that shyness in ELLs is a characteristic that pertains only to certain cultures (Gudiño & Lau, 2010). Although shyness is considered as a negative behavior in some cultures, it may not be considered as a negative outcome in others (Ash et al., 2014; Coplan, Zheng, Weeks, & Chen, 2012). Nevertheless, research with monolingual children, suggests that shyness is found in many cultures in countries like the United States, China, Canada, Russia, Saudi Arabia, and India (Bowker, & Raja, 2011; Coplan et al., 2012; Crozier & Badawood, 2009; Prakesh & Coplan, 2007).

Research regarding the impact of shyness on language development is still in its early stages. However, the existing literature does provide some important insight into the issue and warrants consideration. ELLs at English-only schools, may frequently present shyness and anxiety as they have to face interactions with the unfamiliar language used by educators and peers (Hoff, 2006; Keller et al., 2013). Recent research suggests that shyness and unsociability can be notable in ELLs, particularly when children participate in non-native language contexts. Ash and colleagues (2014) examined the effect of language context on shy school-aged ELLs to determine if shyness could be identified and measured within this group in the US. Children who participated in this research were born in twelve different countries and spoke nine languages. In this research the authors examined the level of shyness in ELLs with parent and child questionnaires. It was found that ELLs were shy in English contexts and more sociable
when speaking their native language. Ash and coworkers go on to note that recognition of shyness in ELLs can and should be used as a foundation for investigating the influence of internal social attitudes like shyness on language to facilitate comprehensive support for the student. Evaluation of shyness in different settings is needed to fully understand the impact of shyness and its implications for language acquisition (Ash et al., 2014).

Despite the fact that Ash and colleagues (2014) discussed the importance of evaluating shyness in ELLs, few studies have investigated the effects of shyness in second language acquisition. These studies have found a correlation between ELLs' shyness and language development in L1 and L2. Strand, Pula, Parks, and Cerna (2011) studied the relation between receptive language skills and shyness in ELLs who were native Spanish speakers in the US. Preschoolers were assessed with a receptive vocabulary test, communication scales, and a shyness scale. Correlation analysis showed that shyness predicts the future receptive language acquisition of ELLs, and not vice versa; current receptive language performance did not predict shyness levels in this population. Similarly, Tong Ting, and McBride-Chang (2011) examined the relationship between shyness and vocabulary skills in Chinese kindergartners learning English as a second language. Children's receptive and expressive vocabularies were assessed in Chinese and English, and children’s shyness was measured with a parent rating scale. In this study, shyness was associated with deficits in receptive language capabilities for the child’s first and second language. They concluded that shyness may limit motivation and willingness to engage in communication, resulting in language limitations that impact the child over the long-term (Tong et al., 2011). Keller and colleagues (2013) examined ELL preschoolers in Germany with standardized language tests in L1 and L2 and collected parents’ rating of shyness to investigate the effect of shyness on second language learning. The results suggested that shy
ELLs demonstrated lower receptive and expressive L2 competency as well as slower receptive and expressive L1 development when compared with their non-shy peers (Keller et al., 2013). Based on these findings, Keller et al. contend that contextual, as well as personality factors, must be taken into consideration when providing second language instruction for ELLs. Finding ways to support children who are shy in learning language is imperative to ensure that expressive language deficiencies do not persist and impact the child’s language development over the long-term.

Synthesis of the research indicates that shyness is an issue of concern which should be assessed and incorporated into efforts to meet the educational and language needs of ELLs. Given this relationship, it is necessary, to know if the language strategies used to support language learning in ELLs are effective to improve the language development of all ELLs and if children who are shy benefit from the same instruction as those who are not. Expressive vocabulary is one aspect of language learning that is essential for ELLs’ success in school. Further, a number of specific interventions have been found to be useful for enhancing expressive vocabulary) for ELLs (Lugo-Neris, et al., 2010; Méndez et al., 2015). However, there is no research that addresses how shyness might impact the outcomes of intervention.

Failure to address the possible impact of shyness on progress in language learning will continue to limit the ability of clinicians to overcome the pertinent second language barrier of shyness that may currently be viewed as recalcitrant to change. The need for research that provides information about the effect of vocabulary teaching strategies with shy and non-shy ELLs will provide insight regarding how to target the individual needs of ELLs in the future.
The Present Study

Given that there is limited research on the impact of shyness on vocabulary intervention outcomes, the purpose of this study was to examine the relationship between the Assertive Social Skills and Shyness/Anxiety rating scale and gains in naming vocabulary following intervention for English Language Learners. This study addressed the following questions:

1. Can vocabulary gains (naming and definition) in English be predicted from the assertive social skills and shyness/anxiety rating scale for ELL’s who received English-only vocabulary intervention?

2. Can vocabulary gains (naming and definition) English be predicted from assertive social skills and shyness/anxiety rating scale for ELL’s who received English-Spanish vocabulary intervention?

3. Can vocabulary gains (naming and definition) in Spanish be predicted by assertive social skills and shyness/anxiety rating scale for ELL’s who received English-Spanish vocabulary intervention?

Methods

Participants

Data for this research were collected as part of a larger research study that investigated the outcomes of Spanish and English vocabulary intervention for English Language Learners. Data samples included 28 Spanish-speaking children from six half day English-only-instruction preschool classrooms in a Head Start center in Ohio. The children were 11 boys and 17 girls between the ages of 3;1 and 5;0, with a mean age of 4;3. Table 1 contains the distribution of children in each classroom and group assignment.
Participating children met the following inclusion criteria: (a) Parent consent was obtained for each participant. (b) Parents reported the use of Spanish at home. (c) Children passed the language screening and hearing screening provided at the Head Start. (d) Children scored at or above a standard score of 90 on the Primary Test of Nonverbal Intelligence (PTONI; Ehrler & McGhee, 2008). The parents completed a questionnaire to obtain demographic information, language spoken at home, and language of proficiency of the child. Table 2 and Table 3 present this information.

Participants were randomly assigned to one of two groups by block randomization: The groups received Spanish-English intervention (SEI; 14), or English-only intervention (EI; 14). Subjects were entered into each group until one group of 15 children and one group of 14 children were established. One child withdrew after the first week of intervention, leaving two groups of 14 children. The ages of the children in the two groups were not significantly different when a t-test were performed $t(26) = .709, p = .485$. The data used on this research was taken from a larger research that investigated vocabulary acquisition of ELLs who received two different intervention approaches. The current research does not attempt to compare the outcomes of these intervention approaches; rather we investigated the relationship between Assertive Social Skills and Shyness/Anxiety rating scale, and the vocabulary naming and definition gains in each intervention group individually.

**Procedures**

Following acquisition of parent consent and demographic data, the Primary Test of Nonverbal Intelligence (PTONI; Ehrler & McGhee, 2008) was administered to each child individually in a quiet room at the Head Start center two weeks prior to initiation of the
intervention. After participants met the inclusion criteria, they were randomly assigned to one of two conditions as explained previously.

Two groups received intervention to increase vocabulary. Children in the SEI group were taught the words in Spanish and English. Children in the EI group were taught the same words in English only. The children’s naming and defining of photographs of all of the words were tested before the intervention began (pretest), and after the six weeks of intervention (posttest).

Selection of Target Words

Twenty-four (24) words were targeted over six weeks (four new words per week). All words were Tier 2 vocabulary for preschoolers 3- to 5 years-old. Six books (one book per week) were selected for the book reading based on interest to preschool children and presence of appropriate words for target vocabulary. Four target words (two nouns and two verbs) were selected per week/book for the English intervention group, and the respective Spanish translation equivalents were selected for the Spanish/English intervention group.

Testing of Target Words

An instrument was designed to measure the children’s naming of the target words at pretest, and posttest. The test included colored photographs representing each of the 24 target words presented on a laptop computer. The fidelity of the translation and the image representative of the concepts were confirmed by the research team.

Each child was invited to participate individually in one session lasting approximately 45 minutes in a quiet separate classroom in the Head Start center. The complete naming task was administered in English to the English-only group. The test was administered in one language.
and then the other and for the SEI group with the presentation of the language (English or Spanish first) counterbalanced. Instructions were provided in Spanish. Color photographs of the target vocabulary were presented on a laptop computer. The order of pictures was randomized across presentations. The children were asked to label the picture using the language being assessed (Spanish or English) (“¿Qué es eso?” “What is this?”). Once they labeled the picture, the children were asked to define the picture (Spanish or English) (“Dime algo que sabes de esto” “Tell me something that you know about this”). The examiner asked the child using Spanish or English to name and define the photograph in that language. If the child did not respond to the naming request, the question was asked again. If the child did not provide a response to the second request, feedback using neutral terms (“You’re such a good listener”) was provided and the next item was tested. Once the child was tested in one language, the examiner tested the other language following the same procedures. The child received a score of 1 for correctly naming the target word and 0 for an incorrect or no response.

**Shyness Measure**

The Assertiveness Scale (Assertive Social Skills and Shyness/Anxiety rating scale) from the Teacher-Child Rating Scale (T-CRS 2.1; Perkins & Hightower, 2002) was used to measure the level of Assertive Social Skills and Shyness/Anxiety percentiles for each child. This scale measures the “child’s interpersonal functioning and confidence with peers” (p.2). This scale consists of eight statements describing the behavior of the child. Teachers rate the child’s assertiveness on a 5-point Likert scale (Strongly disagree to Strongly Agree). The scale includes statements that describe positive assertive social skills (participation in class, expresses ideas willingly, comfortable as a leader) behaviors and negative shyness/anxiety (withdrawn, anxious, worried, nervous) behaviors.
The subscale can be administrated and measured independently of the entire test. The test also provides normative data with percentile ranks for males and females, and urban, suburban, and rural demographic populations. The scale was completed by the clinician who provided the intervention for each child. Clinicians were asked to complete the scale following the last week of the intervention and were instructed to base their ratings on the child’s behavior as they observed it during the six weeks period that children received the intervention. Similar scales have been used in research on shyness (Strand et al., 2011).

In the assertiveness scale higher percentiles indicate greater assertive social skills. In contrast, lower percentiles indicate a comparatively greater incidence of shyness/anxiety behavior (Perkins & Hightower, 2002). For the purposes of this paper, we will present and discuss the results in terms of shyness.

**Intervention**

Both experimental groups received vocabulary instruction two days per week for 35 minutes each session during a period of six weeks. The intervention for the EI and SEI groups addressed vocabulary learning through a shared book reading activity. Children in both groups started and completed the intervention during the same time period. Two English monolingual graduate student clinicians used the same instructional strategies with English as the language of instruction in both groups. The target words were presented by the clinician in English for the EI and SEI groups; however, intervention for the SEI group also included supplemental presentation of the target words and definitions in Spanish, using a text-to-speech translator for each target word.

The intervention session included four steps: introduction, vocabulary explanation, book reading, and individual activities. The introduction, vocabulary explanation, and book reading
were provided in groups of three to four children. The introduction included an overview of the session activities described in English (e.g., Today we are going to learn some words, read a book, and create a picture book.). The vocabulary explanation consisted of the naming of each word combined with a paper photograph (8.5’ X 11’), followed by a child friendly definition of the word. The paper photograph to represent the word was different from the pictures in the book and from the pictures on the target word list used for testing vocabulary learning, which were presented on a laptop. The children were asked to repeat the target word in unison and listen to the word definition. The SEI and EI groups repeated the target word after listening to the English word provided by the clinician and then listened to the definition provided by the clinician in English. The SEI group also listened to the target word in Spanish using the TTS program with a tablet. Children repeated the target word in unison in Spanish after listening to the Spanish word and then listened to the definition in Spanish via the TTS program. The presentation of the English and Spanish words for the SEI group were counterbalanced across sessions.

Following the vocabulary presentation, the clinician read the book with the children. Target words appeared four times in a sentence or phrase during the book reading. Because some of the words did not appear four times in the book, the script was adapted to include additional use of those words in context to assure equal number of presentations of each word. Each target word appeared four times during clinician’s script for the book reading. For the EI group the clinician read the book and followed the script in English, emphasizing the target words in context. For the SEI group, when the target vocabulary words appeared in the book or script, the children also heard the word used in the same sentence translated to Spanish by the
TTS program. Only sentences that included the target words were translated with the TTS program.

In order to prevent variable exposure to the target words, the final part of the intervention session elicited expressive responses from each child individually without other children present. In this individual activity, the clinician engaged the children individually in an activity to elicit naming and definition of the target words. The first day of each week of intervention, each child placed the paper photograph of each target word on a vocabulary chart and named the paper photograph. After each paper photograph was placed on the chart, the child was asked to name all of the photographs. On the second day of each week, each child created a picture book with the photographs of the target words and was asked to name each photograph one time as they pasted it into the book. The clinician then stated the correct name and asked the child to repeat. When the book was completed, the clinician asked the child to write or draw something about each picture. The clinician then asked the child, “Tell me what you know about the picture”. The clinician gave the child-friendly definition and asked the child to repeat. After being asked to name and define the picture in English, children in the SEI group, were immediately asked to name and define the picture in Spanish in the same way. After being asked to provide their answers in Spanish, every child listened to the word or definition via the TTS program and then was asked to repeat the answer in Spanish. Children received positive feedback for all answers (i.e. using neutral terms “You’re such a good listener”). The language of the activities was counterbalanced for the SEI group across sessions.

**Fidelity and Reliability**

Twenty (20) of the 96 sessions (20%) were randomly selected and scored for accuracy of the intervention by two trained graduate clinicians who were not involved in the intervention.
Adherence to the protocol was 100% during the randomly selected sessions. To determine if scoring of the vocabulary test in Spanish and English was consistent across examiners, 10% of the pretests were randomly selected for analysis. Percentage of agreement for scoring by two examiners was 98%.

Results

This research examined the relationship between the Assertive Social Skills and Shyness/Anxiety rating scale and gains in vocabulary (naming and definition) following six weeks of vocabulary intervention for English Language Learners. To determine if the Assertive Social Skills and Shyness/Anxiety rating scale is a predictor of vocabulary gains following vocabulary intervention, six simple linear regression analyses were conducted. Vocabulary gain scores in English and Spanish (pretest subtracted from posttest) for the SEI group, vocabulary gain scores in English for the English-only group, and the Assertive Social Skills and Shyness/Anxiety rating scale percentiles on the T-CRS 2.1 were entered into IBM SPSS v. 23. No missing data were found.

Relationship Between Assertive Social Skills and Shyness/Anxiety Rating Scale, and English Naming Gains for the English-only Intervention Group

Simple regression assumptions were met for English naming gains of the English-only group. (a) Assumption of linearity was met, and random points were within the absolute value of 2. (b) The S-W test was conducted to examine the assumption of normality. A review of normality indicated that the normality assumption was met: (Shapiro Wilk = .973, df = 14, p = .916), skewness (.499) and kurtosis (.062). (c) The assumption of independent errors was measured with the Durbin and Watson test. The test indicated an independence of error of 2.014. These results indicated uncorrelated errors. (d) A scatterplot of studentized residuals, when
compared to values of vocabulary gains, indicated spread of residuals. This suggested evidence of homogeneity of variance.

A simple linear regression analysis was used to determine if the Assertive Social Skills and Shyness/Anxiety rating scale percentiles predicted English naming gains for ELL’s who received English-only vocabulary intervention. Results indicate that English vocabulary gains following a vocabulary intervention were predicted by the Assertive Social Skills or Shyness/Anxiety rating scale for the English-only intervention group, F (1, 12) = 6.775, p < .023. The English-only group unstandardized coefficient of 4.526 and standardized coefficient of .601 are significantly different from 0 (t = 2.603, df = 12, p = .023). In other words, for every point increase on the Assertive Social Skills and Shyness/Anxiety rating scale, the vocabulary score increased approximately four points. Simple linear R squared is .361 suggesting that 36% of the English vocabulary gains by the English-only intervention group were predicted by the Assertive Social Skills and Shyness/Anxiety rating scale. According to Cohen (1988), this suggests a small effect.

**Relationship Between the Assertive Social Skills and Shyness/Anxiety Rating Scale Percentiles, and English Definition Gains for the English-only Intervention Group**

Simple regression assumptions were met for English definition gains of the English-only group. (a) Assumption of linearity was met, and random points were within the absolute value of 2. (b) The S-W test was conducted to examine the assumption of normality. A review of normality indicated that the normality assumption was not met: (S-W = .906, df = 14, p = .137), skewness (.190), and kurtosis (2.130)—this values are not within the range of an absolute value of 2.0. (c) The assumption of independent errors was measured with the Durbin and Watson test. The test indicated an independence of error of 2.274. These results indicated uncorrelated errors.
(d) A scatterplot of studentized residuals, when compared to values of vocabulary gains, indicated spread of residuals. This suggested evidence of homogeneity of variance.

A simple linear regression analysis was used to determine if Assertive Social Skills and Shyness/Anxiety rating scale percentiles predicted English definition gains for ELL’s who received English-only vocabulary intervention. Results indicate that definition in English gains following a vocabulary intervention were predicted by the social Assertive Social Skills and Shyness/Anxiety rating scale for the English-only intervention group, F (1, 12) = 18.264, p < .001. The English-only group unstandardized coefficient of .046 and standardized coefficient of .777 are significantly different from 0 (t = 4.274, df = 12, p = .001). In other words, for every point increase on the Assertive Social Skills and Shyness/Anxiety rating scale, the definition score increased approximately .046 points. Simple linear R squared is .603 suggesting that 60% of the English definition gains by the English-only intervention group were predicted by the Assertive Social Skills and Shyness/Anxiety scores. According to Cohen (1988), this suggests a medium effect.

**Relationship Between the Assertive Social Skills and Shyness/Anxiety Rating Scale, and English Naming Gains for the Spanish-English Intervention Group**

Simple linear regression assumptions were met for English naming gains of the SEI group. (a) Assumption of linearity was met, and random points were within the absolute value of 2. (b) The S-W test of normality indicated that normality assumption was met: (S-W = .935, df = 14, p= .353), skewness (-.262) and kurtosis (-1.244). (c) The Durbin and Watson test indicated an independence of error of 1.460. These results indicated uncorrelated errors. (d) Evidence of
homogeneity of variance was found as the scatterplot of studentized residuals when compared to values of vocabulary gains indicated spread of residuals.

Similar to the English-only group, simple linear regressed showed English vocabulary gains following vocabulary intervention were be predicted by the Assertive Social Skills and Shyness/Anxiety rating scale percentiles for the SEI group, $F(1, 12) = 15.425, p = .002$. The SEI group unstandardized coefficient of 4.906 and standardized coefficient of .750 are significantly different from 0 ($t = 3.927, df = 12, p = .002$). For every point increase on the Assertive Social Skills and Shyness/Anxiety rating scale, the English naming vocabulary score increased approximately five points. Simple linear R squared is .562, suggesting that 56% of the English vocabulary gains by the SEI group were predicted by the Assertive Social Skills and Shyness/Anxiety scores. According to Cohen (1988), this suggests a medium effect.

**Relationship Between the Assertive Social Skills and Shyness/Anxiety percentiles, and English Definition Gains for the Spanish-English Intervention Group**

Simple regression assumptions were met for English definition gains of the Spanish-English group. (a) Assumption of linearity was met, and random points were within the absolute value of 2. (b) The S-W test was conducted to examine the assumption of normality. A review of normality indicated that the normality assumption was met: ($S-W = .890, df = 14, p = .081$), skewness (-.352), and kurtosis (-.733). (c) The assumption of independent errors was measured with the Durbin and Watson test. The test indicated an independence of error of 2.369. These results indicated uncorrelated errors. (d) A scatterplot of studentized residuals, when compared to values of vocabulary gains, indicated spread of residuals. This suggested evidence of homogeneity of variance.
A simple linear regression analysis was used to determine if Assertive Social Skills and Shyness/Anxiety rating scale percentiles can predict definition in English gains for ELL’s who received Spanish-English vocabulary intervention. Results indicate that definition in English definitions following a vocabulary intervention were predicted by the Assertive Social Skills or Shyness/Anxiety Rating Scale for the English-only intervention group, $F(1, 12) = 15.237, p < .002$. The English-only group unstandardized coefficient of .066 and standardized coefficient of .748 are significantly different from 0 ($t = 3.903, df = 12, p = .002$). In other words, for every point increase on the Assertive Social Skills or Shyness/Anxiety Rating Scale, the definition score increased approximately .066 points. Simple linear R squared is .559 suggesting that approximately 56% of the English definition gains by the Spanish-English intervention group were predicted by social assertiveness/shyness scores. According to Cohen (1988), this suggests a medium effect.

**Relationship Between the Assertive Social Skills and Shyness/Anxiety Rating Scale and, Spanish Naming Gains for the Spanish-English Intervention Group**

Simple linear regression assumptions were met for Spanish naming gains of the SEI group. (a) Assumption of linearity was met, and random points within the absolute value of 2. (b) The S-W test suggested that normality assumption was met ($SW = .919, df = 14, p = .212$), skewness (.442) and kurtosis (-.379). (c) The Durbin and Watson test indicated an independence of error of 1.399. These results indicated uncorrelated errors. (d) Evidence of homogeneity of variance was found as the scatterplot of studentized residuals when compared to values of vocabulary gains indicated spread of residuals.

Simple linear regression results indicate Assertive Social Skills and Shyness/Anxiety rating scale percentiles are a significant predictor of Spanish vocabulary gains for the SEI group,
F (1, 12) = 10.515, p = .007. The unstandardized coefficient of 5.751 and standardized coefficient of .683 are significantly different from 0 (t = 3.243, df = 12, p = .007). For every point increase on the Assertive Social Skills and Shyness/Anxiety rating scale, the Spanish vocabulary gains increased approximately five points. Simple linear R squared is .423, suggesting that 42% of the Spanish vocabulary gains by the SEI group were predicted by the Assertive Social Skills and Shyness/Anxiety rating scale. According to Cohen (1988) this suggests a small effect.

**Relationship Between the Assertive Social Skills and Shyness/Anxiety Rating Scale and, Spanish Gains Definition gains for the Spanish-English Intervention Group**

Simple regression assumptions were met for Spanish definition gains of the Spanish-English group. (a) Assumption of linearity was met, and random points were within the absolute value of 2. (b) The S-W test was conducted to examine the assumption of normality. A review of normality indicated that the normality assumption was met: (Shapiro-Wilk = .899, df = 14, p = .109), skewness (-.716), and kurtosis (-.732). (c) The assumption of independent errors was measured with the Durbin and Watson test. The test indicated an independence of error of 2.416. These results indicated uncorrelated errors. (d) A scatterplot of studentized residuals, when compared to values of vocabulary gains, indicated spread of residuals. This suggested evidence of homogeneity of variance.

A simple linear regression analysis was used to determine if the Assertive Social Skills and Shyness/Anxiety rating scale can predict definition in Spanish gains for DLL’s who received Spanish-English group vocabulary intervention. Results indicate that definition in Spanish gains following a vocabulary intervention can be predicted from the Assertive Social Skills or Shyness/Anxiety Rating Scale for the Spanish-English intervention group, F (1, 12) = 10.487,
The Spanish-English group unstandardized coefficient of .067 and standardized coefficient of .683 are significantly different from 0 (t = 3.238, df = 12, p = .007). In other words, for every point increase on the social assertiveness/shyness scale, the definition score increased approximately .067 points. Simple linear R squared is .466 suggesting that 46% of the Spanish definition gains by the Spanish-English intervention group were predicted by the Assertive Social Skills and Shyness/Anxiety rating scale. According to Cohen (1988), this suggests a small effect.

Discussion

Vocabulary knowledge and acquisition of new curriculum-specific vocabulary are critical for communication and success in school (Cena et al., 2013; Shatz & Wilkinson, 2010). Intervention strategies have been developed to teach vocabulary to ELLs, who are at risk for failure to meet the academic demands of school (Lugo-Neris et al., 2010; Méndez et al., 2015; Restrepo et al., 2013). Research examining the relationship between shyness and vocabulary in monolingual and bilingual children, has found that shyness represents a risk factor for the development of language and vocabulary skills (Coplan & Weeks, 2009; Keller et al., 2013; Prior et al., 2008; Spere & Evans, 2009); however, the impact of shyness on vocabulary gains during vocabulary intervention has not been reported. This research is one of the first studies to examine the relationship between assertiveness and shyness and vocabulary gains (naming and definition) following intervention for English Language Learners.

The results of this study indicated that there is a relationship between assertive and shyness and vocabulary (naming and definition) and English vocabulary gains in the EI and SEI groups; and there is a relationship between Spanish vocabulary (naming and definition) gains and assertiveness and shyness in the SEI group. These results suggest that ELLs who
demonstrate a greater level of social assertiveness may be more successful in learning vocabulary in L1 and L2 during vocabulary intervention. In contrast, children with lower assertive social skills (more shy) presented were less successful in learning new vocabulary in L1 and L2. These findings are consistent with other research that has found lower L2 and L1 receptive and expressive vocabulary in ELL preschoolers who are shy (i.e. Keller et al., 2013).

**Shyness/Anxiety and Vocabulary Learning**

Many children who participate in preschool programs show anxiety when transitioning from home to preschool (Franz et al., 2013). This transition could be even more demanding for ELLs who face a new setting and additionally have to use the L2 to communicate because it is the mainstream language in the classroom. In general, second language learners may be expected to present as shy because they may have anxiety when speaking the unfamiliar L2 (Hoff, 2006; Keller et al., 2013). We do not know if this general level of anxiety about transitioning to school and speaking L2 existed for all children in our study, but we did find that children who were rated as more shy had greater difficulty in acquiring new words in the L2 than those who showed lower levels of shyness. It is possible that children who were rated as more shy may have had more limited exposure to the L2 at home, and thus had greater difficulty transitioning to school because of their unfamiliarity with the L2. Children who have limited English exposure at home may have more difficulty in transitioning to school and interacting with others in unfamiliar settings, increasing their shyness ratings.

In addition to shyness related to transitioning to school, the relationship between English vocabulary gains and percentiles on the Assertive Social Skills and Shyness/Anxiety rating scale in both conditions (EI and SEI) could be explained by intrinsic factors that influence the process of learning a new language. These factors include motivation toward learning the L2, attitudes
toward the instructional settings, personality, and self-confidence in speaking the language (Ortega, 2009). Research with adult ELLs suggests that self-perception of errors in pronunciation of the new language can create anxiety (Gregersen & Horwitz, 2002). Negative past experiences with the L2 can contribute to shyness, anxiety, and avoidance of communicative interactions in the context where the L2 is spoken (Sheeran, 2002). These factors may also influence ELLs' avoidance of interacting with teachers and peers in school and during intervention, thus impacting their English vocabulary acquisition.

The social interaction and participation of the children in the vocabulary intervention was observed by the clinicians to inform their rating of Assertive Social Skills and Shyness/Anxiety. Clinicians rated preschoolers based on a scale that includes the following characteristics based on the behavior observed: assertive social skills when participating in class, expresses ideas willingly, is comfortable as a leader; and exhibits shyness behaviors such as withdrawal, anxiousness, worry, and nervousness. When children are shy, they are less willing to communicate and participate in social activities and may miss out on interactions that are important to promote language learning (Hastings, Nuselovici, Rubin, & Cheah, 2010; Keller et al., 2013). In our study, even when ELLs were presented with the same instructional procedure, children who demonstrated high shyness levels frequently avoided answering questions, repeating words individually or in unison, and participating actively during the activities. ELLs who show shyness may miss out on important linguistic interactions with the teacher and peers. Less linguistic involvement and participation in language activities, may decrease linguistic exchanges and inhibit the child in learning and practicing new words.

It seems reasonable that the inclusion of the L1 may diminish anxiety and promote interactions in the L2 in the classroom, which may contribute to a more comfortable atmosphere
to learn a new language. During the SEI condition, children heard Spanish presented by the computer without additional support other than the production of the words and sentences. The impact of this minimal L1 supplement would be unlikely to reduce the child’s anxiety related to communication in an L2 environment. In contrast, support in the classroom that includes ongoing communication with a teacher that speaks the L1 of the child may be more beneficial for reducing anxiety in ELLs than the use of text-to-speech translation only.

Similar to the English vocabulary findings, ELLs who presented greater assertive social skills obtained larger gains in Spanish vocabulary. In contrast, ELLs who showed less assertive social skills or more shyness had smaller Spanish vocabulary gains following the SEI intervention than children who demonstrated lower levels of shyness. ELLs’ levels of shyness also impacted their learning of new words in the L1. These results are consistent with findings from research with monolingual children across ages levels, where shyness has been shown to be related to the acquisition of both expressive vocabulary (Coplan & Weeks, 2009; Crozier & Perkins, 2002; Prior et al., 2008; Spere & Evans, 2009), and receptive vocabulary (Crozier & Badawood, 2009; Spere & Evand, 2009). We found that shyness in ELLs presents a disadvantage not only in the second language but also in the first language. This can be explained by the lack of interactional experiences and missed opportunities to learn either the first or second language, again suggesting that in depth linguistic interactions with the teacher and peers in the L1 would benefit shy students more than the use of a computer to produce Spanish words and sentences.

**Limitation and Future Directions**

Limitations of this study include the size and the cultural background of the population under study. Most of the participants in this study came from Guatemala and some families
speak a Mayan language in addition to Spanish at home. Replication of this study with diverse Hispanic populations is needed in order to determine if our findings can be applied to the general Hispanic population in the US. Cross-cultural research has suggested that children present different levels of inhibition-shyness across different cultures (Chen, 2010).

The shyness rating scale used in this research was designed for teachers who participate with children throughout the day on a daily basis. In this study, the SLPs’ observations of the child were limited to the time (35 minutes per two times per week) the clinician had the child for the vocabulary intervention and to the structured activities of the intervention. The use of multiple assessments to measure shyness is important. Observations of other informants (teachers or parents) in multiple settings may more accurately identify shyness.

The language and cultural background of the clinicians is another potential limitation. Clinicians in this research were mainstream American, English-speaking graduate students, which may have affected their identification of shyness in children from another culture. Clinicians may have socio-cultural expectations and norms for shyness, which may differ from the children’s and caregiver’s socio-cultural expectations (Chen et al., 2004, Chen 2010).

This research did not address receptive vocabulary. It is not known how many of the target words children might have known previously and how this may have influenced their expressive learning. Consideration of the impact of receptive vocabulary knowledge on expressive vocabulary learning by ELLs is a topic for future research.

Provision of supplemental Spanish by a computer is unlikely to diminish anxiety in Spanish speakers because the monolingual adult cannot talk with the children in Spanish to provide a comforting L1 model or have a conversation. Future research may examine the effect
of language of intervention on shyness in a fully bilingual intervention delivered by a bilingual clinician. It would be useful to examine contexts and strategies to help children engage in social interactions that will support vocabulary development of children who are shy.

**Implications**

Preschool teachers have been told that ELLs will have a “silent period” as a normal stage of second language development; however, there is limited evidence for this “silent period” (Roberts, 2014). Teachers may minimize the impact of shyness and assume it is a normal part of the silent period, thinking that children will overcome their shyness in time when they have more exposure to L2 (Hoganbruen, Clauss-Ehlers, Nelson, & Faenza, 2003; Roberts, 2014). Children who are shy may need more than just time; they may need to have active participation in varied social and linguistic interactions and not be left behind. Assuming the child is in a “silent period”: or just shy and will acquire the language with time is not enough (Winsler, Kim, & Richard, 2014). They need active participation in the classroom with strategies that support children to overcome shyness.

These research findings contribute to the literature regarding the impact of shyness on expressive vocabulary interventions for ELLs. Clinicians have to consider that social skills are related to development of language competence, and ELLs who are shy are at risk for limited vocabulary in both L1 and L2 even during a vocabulary intervention. Although the use of the vocabulary teaching strategies increased vocabulary in ELLs in this study, children who are shy may need special support to increase their vocabulary in the classroom. The use of strategies that help children to overcome shyness may help ELLs to make a better transition from home to preschool and improve their linguistic interaction in the classroom, which in turn will promote vocabulary and language skills.
In conclusion, the results of the current research suggest a relationship between assertiveness and shyness and expressive vocabulary gains in both the first and second language in ELLs. These findings have important clinical implications as shyness may represent a risk factor that impacts the acquisition of new words during vocabulary intervention, and these children may benefit from receiving additional coping strategies to promote greater opportunities for interaction with children and adults in the classroom.
Table 1

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<th>Classroom</th>
<th>Total, (n=28)</th>
<th>EI, (n=14)</th>
<th>SEI, (n=14)</th>
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<tr>
<td>Classroom 6</td>
<td>6</td>
<td>2</td>
<td>4</td>
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</tbody>
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Note. EI = English-only intervention group; SEI = Spanish English Group;
Table 2.

Family characteristics and language spoken at home

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<tr>
<th>Characteristics</th>
<th>Total, % (n=28)</th>
<th>EI, % (n=14)</th>
<th>SEI, % (n=14)</th>
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<tr>
<td>Paternal language</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spanish</td>
<td>79</td>
<td>79</td>
<td>79</td>
</tr>
<tr>
<td>Spanish and English</td>
<td>21</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>Additional Language used at home</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mam</td>
<td>25</td>
<td>36</td>
<td>14</td>
</tr>
</tbody>
</table>

Note. EI = English-only intervention group; SEI= Spanish English Group; NR= Parent did not respond.
Table 3.

<table>
<thead>
<tr>
<th>Parent reports of use and proficiency of their children’s language.</th>
<th>Total, % (n=28)</th>
<th>EI, % (n=14)</th>
<th>SEI, % (n=14)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spanish used at home.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Sometimes</td>
<td>14</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Most of the time</td>
<td>82</td>
<td>79</td>
<td>86</td>
</tr>
<tr>
<td>NR</td>
<td>4</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>English used at home.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>4</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Sometimes</td>
<td>82</td>
<td>79</td>
<td>86</td>
</tr>
<tr>
<td>Most of the time</td>
<td>11</td>
<td>14</td>
<td>7</td>
</tr>
<tr>
<td>NR</td>
<td>4</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Mam used at home.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>68</td>
<td>50</td>
<td>86</td>
</tr>
<tr>
<td>Sometimes</td>
<td>21</td>
<td>28</td>
<td>14</td>
</tr>
<tr>
<td>Most of the time</td>
<td>7</td>
<td>14</td>
<td>0</td>
</tr>
<tr>
<td>NR</td>
<td>4</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>How well child speaks Spanish.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Used few words or phrases</td>
<td>4</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Speak the language with errors.</td>
<td>4</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Speak the language with no errors.</td>
<td>86</td>
<td>79</td>
<td>93</td>
</tr>
<tr>
<td>NR</td>
<td>7</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>How well child speaks English</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Used few words or phrases</td>
<td>36</td>
<td>36</td>
<td>36</td>
</tr>
<tr>
<td>Speak the language with errors.</td>
<td>43</td>
<td>50</td>
<td>36</td>
</tr>
<tr>
<td>Speak the language with no errors.</td>
<td>14</td>
<td>7</td>
<td>21</td>
</tr>
<tr>
<td>NR</td>
<td>7</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>How well child speaks Mam</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Do not uses the language</td>
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<td>50</td>
<td>100</td>
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<tr>
<td>Speak the language with errors.</td>
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<td>29</td>
<td>0</td>
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<tr>
<td>Speak the language with no errors.</td>
<td>7</td>
<td>14</td>
<td>0</td>
</tr>
<tr>
<td>NR</td>
<td>4</td>
<td>7</td>
<td>0</td>
</tr>
</tbody>
</table>

*Note.* EI = English-only intervention group; SEI = Spanish English Group; NR = Parent did not respond.
Chapter IV

Discussion

These research papers examined the effectiveness of a vocabulary approach that included the use of supplemental Spanish by an English monolingual speaker to facilitate the acquisition of vocabulary in both languages by preschoolers who are English Language Learners (ELLs). In addition, we examined the relationship between Assertive Social Skills and Shyness/Anxiety rating scale and gains in vocabulary (naming and definition) following intervention for English Language Learners. This chapter includes the following topics: (a) General research findings, (b) general implications of the findings, (c) Future research directions.

Research Findings

The benefits of a bilingual approach for children who are learning two languages have been suggested in a number of studies (Lugo Neris et al., 2010; Méndez et al., 2015; Restrepo et al., 2013). However, the number of bilingual professionals working in schools and clinical settings is limited, and thus children may not have access to bilingual teaching approaches that target their L1 and L2 language needs.

Findings in our research support the use of Computer-Assisted Instruction during intervention, particularly the use of text-to-speech with supplemental Spanish to support L1 and L2. Our findings suggest that the use of this technology helps monolingual clinicians and teachers in teaching vocabulary in Spanish. The use of TTS with supplemental Spanish vocabulary can be used by SLPs and educators as a tool to facilitate Spanish and English expressive vocabulary. The study of computer assisted instruction to improve language in children has shown positive results in children with and without language disorders (for research review see O’Connor & Davidson, 2014).
Findings from our research suggest that children can learn expressive vocabulary in Spanish with the use of TTS during an authentic book reading experience, even when the clinician does not speak Spanish. Gains in naming and definition of vocabulary in English and Spanish observed in the group that used TTS with supplemental vocabulary suggests that this approach can be used by monolingual clinicians to teach target vocabulary in Spanish and English. Gains in English definitions by the group that received this approach, suggested that children were able to draw from their new L1 knowledge to learn L2 definitions. This intervention supported by TTS increased the acquisition of both English and Spanish and suggests that this approach can allow monolingual teachers and clinicians to address the vocabulary gap between ELLs and their monolingual peers in both languages.

Simple definitions in L1 may be a facilitator for the understanding of novel words as children use these new definitions to create semantic maps and relationships between words that can facilitate learning of the L2 definition. Similar findings of gains in English definitions were found by Lugo-Neris (2010). She described how children who were exposed to definitions in Spanish and English improved the ability to define words in English better than those who were exposed to English-only definitions. Other research has also found advantages of using L1 to promote the acquisition of L2 (Farver et al., 2009; Kiernan & Swisher, 1990; Méndez et al., 2015; Perozzi & Sanchez, 1992). Further, our research supports the cross-linguistic theories in which the L1 is used to facilitate acquisition of the L2 (Cummins, 1991; Farver et al., 2009; Goodrich et al., 2013; Kroll and Steward., 1994). Cummins (1981) hypothesized that children's knowledge in the L1 increases and supports the development of the L2. Based on this theory, children in the group that received words and definition in the L1 (Spanish) obtained better
scores in L2 (English) definition than the other two groups because they were supported by words and definitions in Spanish.

Research regarding the impact of shyness on the expressive language development of ELLs is limited. However, shyness is a behavior presented in many ELLs; shyness will impact motivation and willingness to communicate; shyness has implications for expressive language development. Expressive language development is essential to ELL’s success at school; and interventions can be useful for addressing expressive language deficits. Our results indicated that shyness levels were correlated with English vocabulary gains in both the EI and SEI groups and that shyness levels were correlated with Spanish vocabulary gains in the SEI group. These results suggest that ELLs who demonstrate a greater level of shyness learn fewer vocabulary words in L1 and L2 when exposed to a vocabulary intervention. The results are also consistent with research that has found lower L1 and L2 receptive and expressive vocabulary in ELL preschoolers who are shy (i.e. Keller et al., 2013). ELLs may benefit from additional support to overcome shyness and facilitate language acquisition during a vocabulary intervention. Our research findings support the need for further research to continue evaluating the role of shyness during vocabulary interventions with ELLs.

**General Implications**

The use of TTS with supplemental Spanish vocabulary can be used by SLPs and educators as a tool to facilitate Spanish and English expressive vocabulary. Our research found that this intervention, supported by TTS, increased the acquisition of both English and Spanish vocabulary and suggests that this approach can allow monolingual teachers and clinicians to address the vocabulary gap between ELLs and their monolingual peers in both languages.
These findings contribute to the literature regarding the impact of Assertive Social Skills and Shyness/Anxiety rating scale on the expressive vocabulary interventions for ELLs. Clinicians have to consider that social skills are related to development of language competence, and ELLs who are shy are at risk for limited vocabulary in both L1 and L2, even during a vocabulary intervention. Although the use of vocabulary strategies increased the vocabulary in ELLs, children who are shy need special support to increase their vocabulary in the classroom. The use of strategies that help children to overcome shyness may help ELLs to make a better transition from home to preschool and to improve their linguistic interaction in the classroom, which in turn will promote vocabulary and language skills in ELLs.

Current research suggests a relationship between shyness and expressive vocabulary gains in both the first and second language in ELLs. Targeting the individual needs of these children during intervention is necessary. These findings have important clinical implications as shyness may represent a risk factor that impacts the acquisition of new words during vocabulary intervention and children who are shy may benefit from receiving additional coping strategies to have better opportunities for interaction with children and adults in the classroom.

**Future Research Directions**

To address the limited number of bilingual practitioners in school settings that can be matched to the primary language of the ELL, future research may further assess best practices that allow monolingual practitioners to promote vocabulary acquisition in both languages of the child and thus reduce L1 loss. This may be done by using technologies that produce speech in the language of the child.

Using software to produce spoken vocabulary in L1 and L2 in the classroom may be an alternative to promote vocabulary in children at school. The development of a software that
promote academic vocabulary and provides children with repetition of vocabulary, definitions, and storybook translations in the L1 may be an option for monolingual clinicians to integrate supplemental L1 into their language interventions.

Although machine translator technology is not completely reliable yet, new technologies are still in development that will allow clinicians and teachers to have access to live voice translators. For example, the U.S. national security, has been working for decades on the development of a machine translator tool that allows soldiers to communicate accurately with people who speak a language other than English (Weinstein, C. J., 1995). In addition, many free online translators are improving the accuracy of translating live conversations. The advances in technology may help clinicians and teachers to integrate the L1 into a language intervention in the future.

The need for bilingual practitioners is greater every year as the number of children in multicultural environments grows while the number of bilingual practitioners does not increase at the same rate. Telepractice may be a plausible approach to address the shortage of bilingual clinicians in school districts in the US (Pham, 2012). Telepractice is the use of technology to deliver service at distance (ASHA, n.d.). Telepractice can serve as a link to a clinician that speaks the L1 of the child in settings where there is a shortage of bilingual SLPs to provide evaluations or treatment to ELLs.

It is still unclear how shyness impacts language development in ELLs. The study of approaches and strategies that support ELLs who are shy to overcome shyness and promote language growth (i.e. bilingual v. monolingual approaches) is needed. The impact of shyness on the academic performance in ELLs who are shy is also unclear. Future studies may investigate the reasons why ELLs present anxiety in the early stages of second language exposure. For
example, it still not known to what extent social avoidance and withdrawal is part of normal second language development that has been called the “silent period”. Instead, social avoidance by ELLs may be related to anxiety caused by the new language, or it may be that the child does not communicate because he or she is unable to speak the language. It is important to sort out whether shyness is part of the emotional, personal and individual characteristics of a specific child or if the child learned this behavior from their parents or if the behavior is influenced by the child’s cultural background.

Further studies may look for approaches and strategies that support ELLs who are shy to overcome shyness and promote vocabulary growth (i.e. bilingual v. monolingual approaches, scripted speech). Future research may examine the effect of language of intervention on shyness in a fully bilingual intervention delivered by a bilingual clinician. It would be useful to examine contexts and strategies to help children engage in social interactions that will support vocabulary development of children who present shyness.

**Summary and Conclusions**

In conclusion, these articles are responsive to the need of better vocabulary interventions for ELLs who are at risk of developing the vocabulary in both languages. These findings support the use of Spanish/English intervention to promote the acquisition of Spanish expressive vocabulary and definitions in Spanish and English. TTS was found to be a useful method to support mono English SLPs in providing this intervention. The use of this approach may be effectively support the academic vocabulary leaning in both languages of ELLs. In addition, we explore Assertive Social Skills and Shyness/Anxiety rating scale and its impact in the effectiveness of our vocabulary intervention. Findings indicated that specific children’s needs like assertiveness and shyness levels is a predictors of vocabulary gains in a vocabulary
intervention in both the L1 and L2. Future research should explore how to support specific children’s needs (e.g. shyness, children with language impairment) in a vocabulary intervention.
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http://dx.doi.org/10.1017/S0305000900012575


Doi:10.1016/j.jcomdis.2010.06.001


