TEACHING VOCABULARY TO ENGLISH LANGUAGE LEARNERS

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ABSTRACT

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This study determined if the vocabulary gap for English Language Learners (ELLs) and their peers could be bridged through providing home interventions with multiple exposures to words, definitions, model sentences and context. Ninety-one first grade students from a public school in Southern California with a 95% ELL population were researched. ELL students with the interventions made greater gains than English Only students in all areas of word understanding assessed. Students of lower CELDT (1, 2, and 3) benefited more from the interventions than students of higher CELDT levels (4 and 5). Students of CELDT level one, who had interventions, made greater gains in understanding word meaning than any other CELDT level group.

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Chapter 1: The Problem

There is a link between vocabulary and comprehension. Word knowledge has particular importance in literate societies. It contributes significantly to achievement in the subjects of the school curriculum, as well as in formal and informal speaking and writing. Most people feel that there is a common sense relationship between vocabulary and comprehension--messages are composed of ideas, and ideas are expressed in words. Most theorists and researchers in education have assumed that vocabulary knowledge and reading comprehension are closely related, and numerous studies have shown the strong correlation between the two (Ehri, L., Nunes, S., Willows, D., Schuster, B., Yaghoub-Zadeh, Z., & Shanahan, T., 2001; Nash, H., & Snowling, M., 2006; O'Connor, R. E., 2007; Newton, E, Padak, N. D., & Rasinski, T. V. (Eds.)., 2008; Padak, N., 2006; Tam, K. Y., Heward, W. L., & Heng, M. A., 2006). When English Language Learners struggle with comprehension and academic success that struggle can be traced back to difficulty grasping vocabulary. Many studies support the link between vocabulary and comprehension, and even to the result of academic success or failure (Baumann, J. F., Edwards, E. C., Font, G., Tereshinski, C. A., Kame'enui, E. J., & Olejnik, S., 2002; Baumann, J. F., & Kame'enui, E.J. (Eds.)., 2004; Biemiller, A., & Boote, C., 2006; Carlo, M. S., August, D., McLaughlin, B., Snow, C E., Dressler, C., Lippman, D. N., et al., 2004). Unfortunately, there is a large discrepancy among students of various groups with regard to the amount and depth of vocabulary knowledge they obtain before they start school, and this discrepancy often carries on through the school years.

Students with smaller vocabularies find themselves at an academic disadvantage that most of them never overcome (Newton, E, Padak, N. D., & Rasinski, T. V. (Eds.),

2008). English Language Learners fall into one of those groups that need assistance in developing English vocabulary to succeed in school (Graves, M. F., 2006). Not only do English Language Learners experience this disadvantage in vocabulary knowledge, but also "there are profound differences in vocabulary knowledge among learners from different ability or socioeconomic (SES) groups" (Beck, I. L. McKeown, M. G., & Kucan, L., 2002, p. 1). Beck, McKeown, and Kucan (2002) researched the vocabulary size of first grade students, and noted that those of higher SES groups knew about twice as many vocabulary words as those of lower SES groups. Vocabulary size is highly correlated to reading ability (Kleeck, A. V., Stahl, S. A., & Bauer, E. B. (Eds.), 2003). Thus, students learning English who are of lower SES groups begin school at a severe disadvantage in relation to vocabulary size, to those who speak English as their primary language and are in a higher SES group.

In the beginning of the twentieth century the need for explicit vocabulary instruction was discovered. The reading Language Arts Framework for Public Schools noted the discrepancy in students of various groups by stating that "most English-speaking kindergartners enter school with 6,000 to 15,000 words in their English vocabulary, most English-learners do not" (Curriculum Development and Supplemental Materials Commission, 1999, p. 270). Thus, the framework concluded that, "Instruction in English is a critical component of the program for English learners and proceeds simultaneously with direct, explicit, and systematic instruction in reading and writing. Abundant opportunities to participate in oral language and speaking activities help students hear and develop the English sound system and lexicon and support the current development of reading and writing with comprehension" (Curriculum Development and

Supplemental Materials Commission, 1999, p. 270). Thus, English Language Learners should now be explicitly taught vocabulary and given abundant opportunities to interact with new vocabulary and begin to bridge the gap between those who start school with larger vocabularies and those who enter school with the disadvantage of a smaller vocabulary.

Despite these findings and the fact that the majority of teachers are developing vocabulary across the curriculum. It is the focus on academic vocabulary that needs further attention, thus vocabulary instruction continues to lack adequate attention to academic vocabulary in our California classrooms (Biemiller, 2001, Johns, 2006). It is essential that English Language Learners in particular be directly taught the academic vocabulary necessary to succeed in school. In fact, current reading instruction is premised on the view that children can build the vocabulary knowledge they need after learning to read or decode fluently (National Reading Panel, 2000). Therefore, since the early grades focus on developing reading skills and learning to decode fluently, minimum focus is often given to vocabulary acquisition in these early grades. Several studies reveal that it is, in fact, in the early grades when vocabulary instruction proves most critical (Baumann, J. F., & Kame'enui, E.J. (Eds.), 2004; Biemiller, A., & Boote, C., 2006; Zahar, R., Cobb, T., & Spada, N., 2001). Beimiller even notes that, "orally tested vocabulary at the end of first grade is a significant predictor of reading comprehension 10 years later" (Baumann, J. F., & Kame'enui, E.J. (Eds.), 2004, p. 29). There is a need for research-based intensive vocabulary interventions for young children at risk of experiencing reading difficulties (Baumann, J. F., & Kame'enui, E.J. (Eds.), 2004) because a low vocabulary is correlated with reading difficulties and so should be a major focus of reading instruction, especially

in the early grades, though vocabulary instruction is critical at all grade levels and especially for English Language Learners.

The school involved in this study is a low-income school with 98% English Language Learners in Southern California, thus falling into both the English language learning and the low SES groups for disadvantage in vocabulary knowledge. Houghton Mifflin is the adopted reading curriculum for the district. The school is designated a "Reading First" school, which means that all teachers at the school are required to support full implementation of the district's state-adopted reading/language arts program as well as be involved and knowledgeable of the instructional delivery of the program (Assurances for the Sake or Our Students, 2008). Thus, teachers at Reading First schools know the curriculum as well as the research behind the practices they use to teach that information.

Only in recent years have curriculum publishers increasingly focused on developing effective techniques for vocabulary word teaching, and seen the need for explicit instruction in vocabulary, especially for English Language Learners. As a result of the extreme disadvantage English Language Learners in schools face and the discovered need for explicit instruction in English, the Houghton Mifflin Reading Curriculum Publishers (HMR) developed a very effective vocabulary component based on current research. English Language Learners face greater challenges due to a limited vocabulary and need explicit instruction in vocabulary development as a critical component of their curricular program. Thus, publishers of the HMR series based much of their 2008-2009 reading curriculum on studies with English Language Learners. The HMR publishers recognize that English Language Learners need to be directly taught

new vocabulary words, and given multiple opportunities to interact with the new words before those words become part of their working vocabulary (where they use the words in conversation and effectively use the vocabulary to answer academic questions) and thus known well enough to positively influence comprehension.

The Reading First Assurances (Assurances for the Sake or Our Students) are rules developed from the No Child Left Behind federal legislation meant to ensure that all students succeed. Qualifying Reading First schools *must* implement these Assurances (rules). The first Assurance requires teachers to spend two and a half hours of uninterrupted time teaching the Houghton Mifflin Reading curriculum each day. Teachers at Reading First schools are also required to attend reading training each summer, or during the year for a total of 40 hours of additional instruction in teaching reading and 80 hours of practicum. The teachers will "guide the monitoring of student progress based on the selected assessments approved by the district; and use the results to make program decisions for the purpose of maximizing student achievement" (Assurances for the Sake or Our Students, p. 15). Reading First schools are also required to organize and support regular, collaborative, grade level teacher meetings to discuss use of the instructional program and student results on the selected assessments, and to develop action plans for students interventions and/or additional teacher training. The assessments for first grade used to determine interventions and additional teacher trainings involve decoding, vocabulary (often called High Frequency Words in HMR), comprehension, and fluency. Due to the extensive Reading First Assurance requirements and the first grade assessments, teachers at the school site involved in this study noticed

some gaps in student understanding on the high frequency word component of the assessment, yet struggled to realize the root cause of the discovered discrepancies.

The Reading First Assurances require reading trainings each summer for teachers at Reading First schools, which are meant to inform teachers of the research basis for the Houghton Mifflin Reading program and provide additional research-based techniques for teachers to implement in the classroom. The effective research-based techniques of the HMR curriculum become increasingly evident to teachers attending the trainings and this holds true for the high frequency word instructional component. With regard to vocabulary, there are extra lessons provided by HMR to pre-teach and re-teach vocabulary words that students will need extra time learning. These activities involve cloze activities, chants, short sentences and stories with identified vocabulary, explicit and systematic instruction of words with concepts presented in a step-by-step order, scaffolding, teacher modeling, visual examples, interactive guided practice, regular checks to monitor student progress, and meaningful independent practice. For example, a typical extra support lesson would include writing the words on the board and modeling the pronunciation of the word. Then the teacher asks students how many letters are in a word and the group works together to spell the word for a student who builds the word with letter cards. Then the students and the teacher say a cheer of the spellings of the words. The teacher writes some sentences with the new words on the board, while each student reads the sentences. Teachers are instructed in the teacher guide to monitor each child's ability to pronounce the words. Next, the teacher displays different sentences and the students match word cards with the words in the sentences. Last, students write the

words on index cards and work with a partner to draw pictures or symbols for each of the words to help them remember what the word is and what it means.

The HMR vocabulary instruction each week involves introducing the vocabulary words (termed High Frequency Words in HMR) on day two. Teachers state the importance of knowing these words, e.g. because they will encounter them often in reading and use them in speaking and writing. Students see a transparency with the words that has sentences to make up a story using all the new words or pictures to assist students in understanding the new words. For example, if students were learning the words: party, though, their, and car, they may read a story about a girl who could not attend a party, though she wanted to because their family car broke down. The teacher draws students' attention to each new word, modeling how it is pronounced and leading the class in a cheer stating each word and how it is spelled. In the HMR teacher-guide it does not state to explicitly teach the definition, but all teachers involved in the study taught the new words by directly stating a definition. HMR then asks teachers to have children read the sentences on the transparency and the teacher chooses children to read the sentences aloud. Children then have a cloze activity worksheet to give additional practice with the new vocabulary words. On day two students are also given punch-out high frequency word cards to use with partners in a matching game, memory game, or flash card game. So, if students have the punch-out word cards, they could pair the words with their partner's and read them when they get a match, or place all the words face down on the desk and choose two words, reading them as they pick them up, if they match they keep them, if they do not match, they put them back in the same place and the partner takes a turn. Next, students read a decodable story that includes the new

vocabulary words. For Example, if the new high frequency words were: people, your, go, mother, father, and picture, students may read a story that is decodable with the exception of the new high frequency words about a mother and father going to see friends and all the people getting a picture.

Vocabulary instruction on day three involves a daily message that may or may not include some of the new high-frequency words. So, if the new vocabulary words were: father, mother, people, your, go, and picture, the message may say: Good morning class! Today we will read a story about a father and mother. Think about your father and mother when we read the story and you see the pictures. Teachers at the school site involved in the current study ask students to find and write each high frequency word in the message on a whiteboard. In the HMR curriculum it states to have a student identify the words, by having each student write them on their own whiteboard all students practice the words. Next students read a story as a class that includes the new vocabulary words and the new phonics skills. Reading strategies and comprehension is the focus of the reading activity, however, since the story includes all the new high frequency words, students must understand the high frequency words in order to effectively execute the reading strategies and skills. Last on day three, HMR includes high frequency word clues where the teacher reads a clue and the answer to the clue is a high frequency word. For example, if the word was down, the clue might be: the opposite of up. On day four and five there is a daily message again that may or may not include the new vocabulary words that teachers can discuss with the class. The stories are read again and discussed as a class and individually or with partners. On day five the high-frequency words for the week are reviewed with the chant pronouncing and spelling the word. Then the words are

moved to a different area of the room called the “permanent word pattern board” for review throughout the year. Teachers test students understanding of the new words on day five and are encouraged to make index cards for students to read with a partner during small-group time as review.

To summarize what teaching takes place each day for high frequency word instruction at the school site in the current study see Table 1:

Table 1

Summary of HMR Instructional Components for teaching High Frequency Words in First Grade.

Day	Instructional Components
1	Pre-teach high frequency words if teachers desire
2	Introduce new high frequency words, state importance of knowing them Show a transparency with the words that has sentences to make up a story Teachers model pronunciation and lead a spelling cheer Directly state a definition Cloze activity worksheet Punch-out high frequency word cards to use with partners
3	Daily message with vocabulary words, students write them on whiteboards Read a story as a class that includes the new vocabulary words High frequency word clues
4	Daily message with vocabulary words, students write them on whiteboards Re-read and listen to high frequency word story
5	Daily message with vocabulary words, students write them on whiteboards Re-read and listen to high frequency word story Review of pronunciation Chant spelling Move words to a review board for following weeks Assess student learning of the week’s high frequency words

In looking at the direct instruction for teaching new high frequency words, the HMR program addresses students who learn visually and auditorally, but some students

who learn kinesthetically may require additional instruction. The small-group time for HMR involves students working independently on review activities while teachers call individuals or small groups of students for additional assistance in areas where they struggle. At the school site for this study teachers use this time to review the new vocabulary through visual and auditory means, but to also provide some activities for those students who learn through a more kinesthetic or tactile way.

During small group intervention, teachers at this school site have students work independently using flash cards to review high-frequency words: re-reading the stories that include the new words: playing memory games with the words: filling in word boxes and cloze sentences: artistically decorating the new words, building the words with pipe cleaners, or rice or beans, building the words with stamps or letter tiles, and becoming a member of the high-frequency word club. All students receive a list of the high-frequency words for the year and each week that they can say the new words and properly use the eight or nine new words in a sentence they get a sticker. Teachers also use this time to work with small groups of students to review the vocabulary, pre-teach, re-teach, and put students on a listening center to hear the story with the new words.

Despite the effective teaching taking place from the research foundation of the HMR curriculum at the site involved in this study, it was discovered that many students in first grade learn the new high frequency words for the first three themes (each theme consists of three weeks in HMR, thus they learn the words for the first nine weeks), and then struggle learning them for the rest of the year. Thus, the classroom instruction is consistent throughout the year, providing rich context and various activities to reinforce the learning of the vocabulary each week. Yet, beginning in theme four, students at the

site either know all the words each week, or they do not know any of the words well. This trend could develop because many of the words are non-decodable, yet students have been taught through kindergarten to decode through phonics and word patterns without realizing that some of the patterns do not follow the pattern and must be memorized through word configuration. If non-decodable words (i.e. sight words/high frequency words) is the real challenge, what can be done to help second-language learners overcome this tendency to get stuck as they move into vocabulary words that cannot be decoded through phonics (grapheme/phoneme relationship matches: e.g. cat, pig) or structural approaches (word patterns such as onsets and rimes e.g. wig, sheep)?

The first three themes' vocabulary in the reading series used by the population in the pilot study are mainly a review of kindergarten words, and teachers at this site surmised that when students are presented with new, unfamiliar words, they simply do not encounter the words enough through reading or speaking to know the word and recognize the whole word in printed context. Therefore, the student resorts to the decoding strategy to "sound out" the word which is typical of beginning readers, particularly as so much emphasis is placed on sounding out words, yet as a result the student often pronounces the word incorrectly and, because they pronounce the word incorrectly, they miss any chance of recognizing the meaning of the word. Many of the words chosen for the series are selected because they are frequently used in speech and reading; however, the majority of students at this site do not speak English at home. So, it is more likely that due to English being their 2nd language, these words are unfamiliar to them; they struggle with the pronunciation and understanding of how to use these words Thus, these new vocabulary words are not "high frequency words" for this particular

population of English Learners. The only time students encounter these new vocabulary words is in the classroom. This presents a unique challenge for teachers at the site involved in this study: teachers are using effective research-based curriculum to teach students words that are supposed to be "high frequency," meaning that they are encountered often in speech and reading, *yet the words are new to the students*. This difference could greatly affect the way teachers should teach the new vocabulary words. It was also observed that, even when students did think they knew the words, they often pronounced the words incorrectly as well and were unable to use the words in a sentence. This difficulty with pronunciation could be because parents who do not speak English try to help their children learn the words but do not know the definition or proper pronunciation themselves and so the help provided is limited.

If HMR is a somewhat scripted program that teachers at the site involved in this study must follow, and if the HMR program is effectively research-based, then why are students experiencing a challenge with high-frequency words? After considering effective strategies for teaching English-Language Learners new vocabulary words, and examining current research on effective vocabulary instruction, the missing piece seemed to present itself. Students get effective vocabulary teaching in the classroom, yet the English Language Learners at this site are not getting enough repetition with the words in the classroom and at home both in isolation where they might see, read, and hear the word read orally and correctly as well as seeing and hearing the word used correctly in context. Teachers then, must provide the richest vocabulary-learning environment in the classroom for English Language Learners to experience, and attempt to bridge the gap in

their lack of vocabulary through extending those rich vocabulary experiences to the home environment.

According to O'Connor (2007), "home environment contributes to opportunity to learn and differences between the vocabulary size of children from high- and low-income households have been documented in many studies. On average, children who are raised in higher-income households own more books and have more opportunity for prolonged conversation with adults that includes a rich store of unfamiliar words" (p. 14). Children learning English and those from low-socioeconomic status lack the repetition of the vocabulary at home. Thus, students do not incorporate the new vocabulary words into their speech, and the words remain somewhat unfamiliar. Students not only need the effective vocabulary instruction to learn new words, but in order for these words to be known well enough to be pronounced correctly and used in a sentence properly, learners must encounter the words often and hear them in context so as to decipher the meaning.

Based on these conclusions of the impact of the home environment, two main aspects of the home support remain in question. Do the students simply need to hear the words more often at home to learn their proper pronunciation and their meaning? Or, do they need to hear the words in context to understand their pronunciation and meaning? Based on these two questions the specific research questions for this study arose.

1. Do multiple exposures and/or context positively impact student pronunciation and/or understanding of word meaning?
2. Do multiple exposures to vocabulary words and/or context positively affect word pronunciation and/or understanding of word meaning for English Language

Learners? Is the impact of multiple exposures and/or context the same or different for English Only students compared to English Language Learners?

3. Does the number of encounters needed to learn new words vary with CELDT level proficiency? Does CELDT level affect the impact of context on word learning (meaning or pronunciation)? Will students of higher or lower CELDT level benefit more from hearing the words in context?
4. Will age affect the impact of multiple exposures and/or context on word learning?

The Reading First Assessments require a deep understanding of the high frequency words. Students must know how to pronounce and read the words, as well as understand their meaning enough to answer comprehension questions about a passage that includes the new vocabulary words. Since these Reading First Assessments are the basis for the program decisions and interventions at the site involved in this study, they became the standard for the degree of understanding students must have of the new vocabulary words taught. The original hypothesis was that students need to encounter the new vocabulary words more often so that the words can become "high frequency" words that students hear often and use in daily conversation, but after further consideration of the situation at the site, and based on analyzing the assessments that students struggle with, the addition of context came about. Students need to read the word with correct pronunciation and understand the meaning so well that they comprehend passages containing the new vocabulary words. The hypothesis for this study then is multifaceted. If low income English Language Learning students could see and hear the new vocabulary words more, and see and hear them in context, they will be able to read and

pronounce the words correctly while learning the meaning of each word as presented in the sequence of the curriculum.

This study involves the major concepts of multiple exposures (encountering words many times through seeing reading and hearing) to vocabulary words, and multiple exposures to vocabulary words in context. The study then seeks to determine the effect of both multiple exposures and context on word pronunciation and student understanding of word meaning. Three groups of first grade students were given varying amounts of visual, auditory, and contextual support. Group 1 was given the in-class high frequency word instruction as it had been done previously in accordance with the Reading First Assurances including full implementation of the HMR curriculum, and all the additional teaching support strategies mentioned in this study. Group 2 received the same in-class high frequency word instruction as group 1, but in addition were given a tape or CD with the pronunciation, definition, and a sentence for each word to take home every night and listen to while following along on a visual chart of the word spelling, definition, and a sentence with each word. Group 3 received the same in-class high frequency word instruction as group 1 and 2, and they received a tape or CD with the same word pronunciations, definitions, and sentences as well as the visual chart to follow while listening, but in addition they took home a story that had each word in context. Group 3 heard the story read to them on the tape or CD and followed along with the words. After the story concluded, they used a window to locate each new word within the story, as it was re-read on the tape or CD.

More specific hypotheses developed because of this organization to the study (e.g. the decision to compare the impact of multiple exposures to vocabulary words with the

added support of context, as well as discover if students at the school site involved in the study benefit from these home interventions). Each group should perform increasingly better based on the amount of support. Thus, students in group 3 would perform better on the word and sentence assessment than students in group 2 (since students in group 3 worked with words in context), and students in group 2 would perform better on the same assessment than students in group 1 (because students in group 2 worked with multiple exposures to the words at home). The amplified auditory, visual, and contextual support should increase student performance on the assessment in both areas of word pronunciation and word meaning. It also seems that students who know less English (have been designated as CELDT, level 1 or 2), would benefit more from any amount of auditory, visual, or contextual support, since they are hearing English words less frequently in general. Likewise, younger students should benefit more from the increased auditory, visual, and contextual support since such scaffolds would provide more exposures to the target words as well as give the contextual background that younger students may lack.

Chapter 2: Literature Review

Twenty years ago educators noticed a gap in student's comprehension as it related to vocabulary development (Biemiller, A., & Boote, C., 2006; Carlo, M. S., August, D., McLaughlin, B., Snow, C. E., Dressler, C., Lippman, D. N., et al., 2004; Nash, H., & Snowling, M., 2006; Tam, K. Y., Heward, W. L., & Heng, M. A., 2006). In other words, students were not meeting expectations in comprehension, and researchers began to study if that struggle was related to vocabulary difficulties. Nash and Snowling (2006) sought to determine where the gap originated and their discovery was that comprehension difficulties *did* in fact primarily result from lack of vocabulary knowledge. Children who have poor vocabulary knowledge are at risk of wider language weaknesses and reading comprehension difficulties, which will impact upon their educational achievement.

Researchers agree that vocabulary knowledge is a powerful predictor of reading comprehension and academic success (Baumann, J. F., & Kame'enui, E.J. (Eds.)., 2004; Biemiller, A., & Boote, C., 2006; Newton, E, Padak, N. D., & Rasinski, T. V. (Eds.)., 2008; O'Connor, R. E., 2007; Share, D. L., 2004). Baumann et. al.(2002, p. 155), state that the assertion that there is a causal relationship between vocabulary and comprehension has been referred to as the "*instrumentalist hypothesis*, which claims that vocabulary knowledge is directly and importantly in the causal chain resulting in text comprehension." Thus, it is vocabulary knowledge that influences comprehension. It was noted, however by Swanborn and Glopper in their study of Dutch sixth grade students in nine elementary schools that low-ability readers hardly learned any words incidentally (2002). Therefore, unless students, particularly those struggling in reading, are explicitly taught vocabulary words, they do not learn the new words simply through encountering

them in reading. Without knowing the vocabulary, struggling readers will face an even greater challenge comprehending what they read.

Other research studies conducted in the past twenty years agreed with this finding that some students do not learn new words without being directly taught the words or at least taught strategies to decipher the word's meaning (Atay, D., & Kurt, G., 2006; Baumann, J. F., & Kame'enui, E.J. (Eds.)., 2004; Beck, I. L., & McKeown, M. G., 2007; Biemiller, A., & Boote, C., 2006; Brett, A., Rothlein, L., & Hurley, M., 1996; Carlo, M. S., August, D., McLaughlin, B., Snow, C. E., Dressler, C., Lippman, D. N., et. al., 2004; Ehri, L. C., & Rosenthal, J., 2008; Francis, D. J., Rivera, M., Lesaux, N., Kieffer, M., & Rivera, H., 2006; Graves, M. F., 2006; Green, L. C., 2004; Nichols, W. D., & Rupley, W. H., 2004; O'Connor, R. E., 2007; Roberts, T. A., 2008; Sagarra, N., & Alba, M., 2006; Shostak, J., 2001; Swanborn, M. S. L., & Glopper, K., 2002; Tam, K. Y., Heward, W. L., & Heng, M. A., 2006). Since vocabulary is such an influential link to reading comprehension, and since students do not learn many vocabulary words incidentally, it is important to directly teach vocabulary in school.

Explicit vocabulary teaching became a major focus of reading instruction. With this new direction, a discrepancy in vocabulary acquisition was particularly noted with students of low socio-economic status and English Language Learners. Hart and Risley (2003) sparked further research into low socio-economic students when his study revealed the huge vocabulary deficit faced by many children of poverty. Likewise, Graves (2006) drew attention to English Language Learners by noting that, "growing numbers of English-language learners in U.S. classrooms require assistance in developing their English vocabularies" (p. 1). These conclusions lead to the National Reading Panel

identifying vocabulary as one of the five central components of reading instruction, and by 2002 No Child Left Behind legislation "identified vocabulary instruction as one of the five required components of Reading First programs" (Graves, 2006, p. 1). With this collection of research and the federal requirement to focus on vocabulary through No Child Left Behind, surprisingly, in 2006 Beimiller and Boote noted that there were still very few studies of children in elementary school and vocabulary instruction. Thus, there is much to learn and study in the area of vocabulary instruction, particularly with regard to low socio-economic children and English Language Learners.

Vocabulary instruction is a major component in reading comprehension. Unless students understand the vocabulary contained in the selection they read, they will be unable to fully comprehend the text. In 2000, the National Reading Panel noted that current reading instruction was premised on the view that children can build the vocabulary they need after learning to read or decode (Biemiller, A., & Boote, C., 2006). Based upon this premise, vocabulary was not explicitly taught until later grades after children could already read. Biemiller and Boote (2006) also noted in their review that vocabulary tested in first grade was a powerful predictor of reading comprehension ten years later, and thus stressed the need to focus on vocabulary instruction even, and perhaps most especially, in the primary grades. Beimiller and Boote (2006) further state that until schools are prepared to emphasize vocabulary acquisition, especially in the primary grades, less advantaged children will continue to be handicapped even if they master reading written words. According to Beimiller and Boote (2006), there are two groups of variables that affect reading acquisition during primary years: decoding skills and vocabulary. Teacher assessments of the students involved in the current study

revealed success in the decoding aspect of reading acquisition, so vocabulary became the focus. Since the purpose of reading is comprehension, and one of the two major building blocks to comprehension is vocabulary development, then effective vocabulary instruction should be a major focus in the reading program taught in the primary grades.

The broad scope of influence that vocabulary knowledge has on student's academic success is fairly recent, but there is no debate that vocabulary knowledge is foundational to reading comprehension. All current research on the subject of vocabulary instruction agrees that the level of understanding of vocabulary contained in a text directly affects the comprehension of that text. The contrast was also true in a study by Atay and Kurt (2006) where they noted that limited vocabulary was an important predictor in the underachievement of children. Padak (2006) in her review quoted Baumann and Kameenui as taking the connection between vocabulary instruction and reading comprehension even further by stating that "decades of research has consistently found a significant connection between vocabulary knowledge, reading comprehension, and academic success" (p. 8). Student's academic success is directly impacted by their vocabulary knowledge.

Not only does vocabulary affect reading comprehension and academic success, but it influences reading rate, later reading knowledge, school progress, and reading competency. If students stop to decode words, this interrupts fluency. Students may not get to comprehension as they are concentrating on pronouncing the words. One study involving five students most in need of assistance in improving their reading proficiency showed improvement in their oral reading rate when they received explicit vocabulary instruction (Tam, K.A., Howard, W. L., & Heng, M. A., 2006). For example, when

students in the study by Tam, Howard, and Heng were given one minute to read a passage, students who had vocabulary instruction read more words in that minute than those who did not have any vocabulary instruction. The students in the study experienced an increase in the number of words read correctly when asked to read a passage in a fixed amount of time. Another study of fifty-seven low SES and at risk kindergarten children noted that vocabulary was the second strongest predictor of later reading after alphabetic knowledge (Kleeck, A. V., Stahl, S. A., & Bauer, E. B. (Eds.)., 2003). Likewise, Penno, Wilkinson, and Moore (2002) along with Nash and Snowling (2006) stressed that vocabulary is strongly linked to school progress and competency in reading as well as educational achievement. Thus, vocabulary influences even more aspects of education than previously indicated by early research in vocabulary instruction. The educational implications of vocabulary instruction on student success are still being discovered and backed by research.

Unfortunately, many English Language Learners are at a disadvantage when it comes to learning new vocabulary. Graves commented on a study by Risley called *Meaningful Differences in the Everyday Lives of Young American Children,* noting that the study "revealed the huge vocabulary deficit faced by many children of poverty. Growing numbers of English Language Learners in U.S. classrooms require assistance in developing English vocabularies" (Graves, 2006, p.1; Roberts, 2003). However, by 2000 few researchers had developed programs to improve student's second language reading vocabulary (Cario, et. al, 2004). This study also revealed that students with low vocabulary had poor comprehension.

This finding, that students with low vocabulary also struggle with comprehension, agrees with many studies that mentioned a "Matthew Effect" for vocabulary instruction. The "Matthew Effect" is a theory developed by Keith Stanovich that derives from a passage of the Bible in Matthew 25:29 "For to everyone who has, *more* shall be given, and he will have an abundance; but from the one who does not have, even what he does have shall be taken away" (New American Standard Version). Stanovich (2009) explains that he "specifically explored the idea of Matthew effects in the domain of reading achievement," and he "specifically outlined a model of how individual differences in early reading acquisition were magnified by the differential cognitive, motivational, and educational experiences of children who vary in early reading development" (p. 1). He discussed a "rich get richer concept" in cooperation with a "poor get poorer idea". In his theory, children who begin school with little phonological awareness begin a spiraling down effect where they struggle with word recognition because they lack alphabetic coding skills. Then since their difficulty with word recognition requires so much attention, they have fewer cognitive resources to allocate to higher-level cognitive processes related to comprehension. Reading then becomes an unrewarding experience, so they participate in fewer reading-related experiences. Thus, these disadvantaged children continue a negative spiral that often leads to further hindrance of academic achievement. Stanovich's theory (2009) also explains that the opposite is true as well that children who quickly develop efficient decoding skills find the reading process more enjoyable and can concentrate on the meaning of the text. Then they choose more reading-related experiences such as reading for choice or reading to discover answers to questions, reading magazines, etc., which in turn gives them more exposure to vocabulary

and reading practice, which facilitates the reading of more interesting and difficult texts. Thus, the advantaged students who come with developed decoding skills begin a "spiral up" to greater academic achievement and success in school.

In the studies that mentioned the "Matthew Effect," they related this concept of the "rich get richer and the poor get poorer" to their findings with vocabulary development where students who enter school with greater vocabulary knowledge make greater vocabulary gains during school and thus experience more academic success, while the contrary holds true as well that students who enter school with less vocabulary knowledge learn less vocabulary in school and therefore experience less academic success (Baumann, J. F., & Kame'enui, E.J. (Eds.).,2004; Beck, I. L. McKeown, M. G., & Kucan, L.,2002; Ehri, L. C., & Rosenthal, J., 200;, Ehri, L. C., & Rosenthal, J., 2007; Kleeck, A. V., Stahl, S. A., & Bauer, E. B. (Eds.)., 2003; Newton, E, Padak, N. D., & Rasinski, T. V. (Eds.)., 2008; O'Connor, R. E., 2007; Justice, L. M., Meier, J., & Walpole, S., 2005; Penno, J. F., Wilkinson, I. A. G., & Moore, D. W., 2002; Swanborn, M. S. L., & Glopper, K., 2002; Swanborn, M. S. L., & Glopper, K., 1999). In many of these studies the students with higher vocabularies made greater gains throughout the study than those students with smaller vocabularies, however some of the studies also focused on reading ability. Those with higher reading ability did better on the assessments, and those with lower reading ability did worse.

Thus, how do teachers of English Language Learners and low-income students combat the Matthew Effect (e.g., the rich get richer and the poor get poorer as it applies to literacy – those who have large vocabularies become more proficient readers and those who have smaller vocabularies become less proficient readers)?

The first step to combating the possible "Matthew Effect" in vocabulary for English Language Learners and low-income students is to discover the most effective research-based techniques for teaching English Language Learners new vocabulary. The second step is to evaluate the current teaching practices with the effective research-based techniques in mind, and the last step is to fill-in the discovered gaps in the vocabulary instruction. One study noted that there are few ways of assessing later stages of word knowledge (Justice, L. M., Meier, J., & Walpole, S., 2005). The difficulty with this process is that vocabulary instruction is so multifaceted that it is an extremely complicated task to isolate any one aspect of the teaching to determine the missing link. Not to mention the difficulty determining the depth of understanding students have of new words. However, teachers and researchers seeking to make an impact on education have a responsibility to attempt to discover missing links in vocabulary acquisition and through research determine what strategies can provide disadvantaged students with greater vocabulary understanding.

In order to accomplish the goal of determining English Language Learner's greatest needs for vocabulary instruction, the current vocabulary program must be evaluated. HMR is the reading program adopted at the site involved in this study, and the vocabulary component of the curriculum is research-based. One study in particular lays the foundation for the importance HMR places on vocabulary instruction. In this writing study conducted in UC schools, English Language Learners "experienced numerous vocabulary problems" (Scarcella, R. C., 2003, p. 9). The developers of HMR wondered how students could progress so far in school with such a great gap and sought to begin meeting their now obvious need of more effectual vocabulary instruction.

In looking at several sources directly from HMR reading trainings, it is clear that the developers of HMR reading realize that vocabulary affects how students listen, speak, read, and write (Green, L. C., 2004). According to HMR research, effective vocabulary instruction should be guided by three principles: 1, the definition and context, 2, deep processing of the words (such as using the words in sentences), and 3, multiple exposures to the new vocabulary words (Shostak, J., 2001). These researchers also agree that most effective teaching does not depend on a single vocabulary instruction method (Shostak, J., 2001). This emphasis on a variety of instructional methods is clearly demonstrated in their curriculum.

HMR provides a variety of activities for high frequency word learning, the multiple exposures to the new words, and the practice using the words (Shostak, J., 2001). In addition to the need for a variety of instructional methods, HMR research also notes that successful vocabulary instruction must be direct and explicit (Francis, D. J., Rivera, M., Lesaux, N., Kieffer, M., & Rivera, H., 2006; Green, L. C., 2004; Scarcella, R. C., 2003; Shostak, J., 2001). While other researchers, not used as a basis for HMR development and training agree with the fore mentioned findings, they reveal some areas that still need improvement in vocabulary instruction. Even when effective reading programs are followed closely, gaps may come since the children, their home environments, teaching styles, and instructional emphasis can vary from school to school. Not only this, but also when teaching English Language Learning students, the vocabulary curriculum is actually having to take the place of the home learning environment. However, can a rich language environment where there is much speaking, listening, reading and writing (like those experienced by English speaking families) be

replaced with multiple classroom-based vocabulary strategies, no matter how effective those strategies may be? Though most would agree that a rich home language environment cannot be replaced, teachers of English Language Learners must develop the most effective and vocabulary-rich school experience possible and discover how to bridge the language gap that exists between home and school.

Home environment plays a significant role in student learning of new vocabulary. As mentioned previously the home environment impacts the number of vocabulary words students enter school with and learn each year. The home environment can also influence the number of interactions outside of the classroom when children encounter new vocabulary words. Many studies support the concept of multiple exposures, (i.e. that students need to encounter target vocabulary multiple times before learning the word) (Baumann, J. F., & Kame'enui, E.J. (Eds.), 2004; Beck, I. L., & McKeown, M. G., 2007; Beck, I. L. McKeown, M. G., & Kucan, L., 2002; Biemiller, A., & Boote, C., 2006; Brett, A., Rothlein, L., & Hurley, M., 1996; Carlo, M. S., August, D., McLaughlin, B., Snow, C. E., Dressler, C., Lippman, D. N., et al., 2004; Ehri, L. C., 2005; Justice, L. M., 2002; Justice, L. M., Meier, J., & Walpole, S., 2005; O'Connor, R. E., 2007; Pearman, C. J., & Lefever-Davis, S., 2006; Penno, J. F., Wilkinson, I. A. G., & Moore, D. W., 2002; Scott, J. A., Jamieson-Noel, D., & Asselin, M., 2003; Share, D. L., 2004). According to Kleeck, Stahl, and Bauer (2003), "we know that children normally need several exposures to a word in order to learn it. Young children learn their first words from among those that are most frequent in their language environments" (p. 19). If children do not hear new vocabulary at home, they are less likely to learn the words so that it impacts their comprehension. Beck, McKeown, and Kucan (2002) assert that, the vocabulary research

strongly points to the need for frequent encounters with new words if they are to become a permanent part of an individual's vocabulary repertoire. "Part of the problem with measuring the number of encounters new vocabulary requires is that word learning is incremental, so that a single encounter with a word may provide some amount of learning, while 100 encounters will still not engender a native speaker's complex knowledge of the word (its collocations, associations, and pragmatic values)" (Zahar, R., Cobb, T., & Spada, N., 2001, p.544). Isolating the number of encounters students need is also complicated, because it is difficult to decipher if the number of encounters alone can bring about the complex knowledge that a native speaker has of vocabulary words, or if other aspects influence this deeper knowledge.

The classroom can only provide so many exposures to target words, so encounters with the vocabulary words in the home environment prove extremely important. Beck and McKeown (2007) hypothesized that students need multiple exposures over a span of several days, and students who received multiple exposures to the target words performed better on the assessment. According to Jerome Shostak (2001), students need repeated encounters with new words if vocabulary instruction is to have a measurable impact on reading. A word needs to be encountered eight times for incidental word learning, and the probability of incidentally learning new vocabulary decreases for those who can't read (Carlo, M. S., August, D., McLaughlin, B., Snow, C. E., Dressler, C., Lippman, D. N., et al., 2004). Granted, the previous study addressed incidental word learning and the number of necessary encounters with new vocabulary should decrease when combined with explicit effective vocabulary instruction. However, even in a study of English speaking students, the discussion included the assumption that more encounters (than the

four or eight exposures the study included) would lead to greater knowledge of the word and the students in the study received instruction in the spelling and pronunciation of each word (Share, D. L., 2004). The number of necessary exposures increases for students learning a second language. “ELLs-and their classmates-need between 12-14 exposures to a word and it’s meaning” to gain a deep understanding of the word (Francis, D. J., Rivera, M., Lesaux, N., Kieffer, M., & Rivera, H., 2006, p. 8). Typically students are expected to learn new vocabulary each week. Considering the necessary 12-14 exposures that students learning a second language need, even if the words were introduced Monday, classroom teachers would have to provide more than two meaningful exposures each day. This many encounters per day is possible, but students learning another language may require more time with each word and may feel overwhelmed with so many new words and so many encounters with those words that the instruction may not be effective. In other words, though the teacher may provide two or more exposures to target vocabulary, students may not actually experience that many. They are so focused on other aspects of the language and the learning experience that they miss the focused encounters with the new vocabulary.

One study had a particularly intriguing aspect to their research in vocabulary acquisition that supports the idea that parents need to be given strategies or resources so children can encounter vocabulary words more often. Maria Moreno Jaen noted that depending on the processes and tasks people are engaged in while handling information, it will either be sent to long-term memory, or it will be forgotten (Jaen, M. M., 2005/2006). People forget information if they do nothing to stimulate storage of that information, and important information needs to be recalled quite regularly in order not to

disappear (Jaen, M. M., 2005/2006). Jaen describes the memory process as progressing from encoding to storing and then to retrieving. English Language Learners miss the storing aspect of vocabulary learning and thus have nothing to retrieve in the future. Storage of knowledge happens when information is recalled regularly, and for some English Language Learners, merely recalling the information at school is not enough. Baumann and Kame'enui (2004) noted the importance of deep processing in vocabulary learning, which is certainly done by classroom teachers, but can be enhanced and reinforced by parents if they are given effective tools. In the present study, audiotapes were sent home with students. Each tape or CD provided parents with varying amounts of audio and contextual support to learning new vocabulary words in an attempt to discover if such support would increase word pronunciation and meaning for English Language Learners. For example, one group of students took home a tape or CD with words, definitions, and sentences for the words. While another group of students took home a tape or CD with the words in context.

Both current research and ancient research agree on the critical role of parental reinforcement of significant learning. In Deuteronomy 4-6 of Biblical text the Israelites are reminded of the Ten Commandments, and parents are exhorted that in order for their children to learn these statutes in such a way that they will do them, so that those concepts will be "written on their hearts" they must teach them when they sit in the house and when they walk, when they lie down and rise up, they shall be bound on their foreheads, and shall be written on their doorposts and gates. Thus, multiple exposures to important information are necessary for deep understanding of those concepts to occur. Psalm 78:1-8 directs parents to teach their children. Parents are responsible for teaching

their children and children in turn teach the children of the next generation and the process continues. In the New Testament, Ephesians 6:4 discusses the importance of parents teaching their children about Christ and his teachings. This concept was extremely important to Christians, and supports the impact parents can have on their children's learning. Since most of the parents of students involved in the present study speak a different language than their children learn in school, there needed to be a way to help parents provide effective opportunities for their children to interact with the key vocabulary at home and reinforce what they need to learn.

In developing a tool for parents to help their children learn new vocabulary at home, one aspect of vocabulary became very evident that parents could help with: multiple exposures to words through listening. Beck, McKeown, Kucan (2002), state that students can understand more sophisticated content through oral language than they can read independently. If parents were given the tools to enrich the vocabulary through multiple exposures and context, students should improve in their ability to understand difficult vocabulary. It has been shown that wide reading develops readers' vocabularies (Baumann, J. F., & Kame'enui, E.J. (Eds.)., 2004; Kleeck, A. V., Stahl, S. A., & Bauer, E. B. (Eds.)., 2003; Beck, I. L., & McKeown, M. G., 2007). However, students who need the most help with vocabulary development are the same students who have trouble reading well, but students learn vocabulary from both reading *and* listening (Baumann, J. F., & Kame'enui, E.J. (Eds.)., 2004). Thus, even if students cannot personally read the story to gain the vocabulary, if they *hear* the story and have their attention directed to the important vocabulary, they may be able to grasp an understanding of some of the vocabulary words.

O'Connor (2007) noted that, through repeated reading of books, children can develop vocabulary. Pearmen and Lefever-Davis (2006) also discovered that repeated readings resulted in substantial gains in sight word recognition. Since the parents of most students involved in this study have limited English vocabulary, yet students can learn vocabulary through repeated exposures to the words, it was decided to provide audiotapes with the vocabulary words, a definition of the words, a model sentence including the words, and for some students even a story with the vocabulary words in context. Furthering the decision to utilize audiotapes as the resource for parents and students in the current study was Jaen's research on which aspect of words seems to be more efficient in helping the brain processes new information (2005/2006). Her study revealed that the phonological aspect of words seems most reliable in helping the brain store new vocabulary, so children, especially children learning a second language need to repeatedly hear the words they are expected to learn. Scarcella (2003) suggests that audiocassettes are useful to give students more exposure to academic input. In Kleeck, Stahl, and Bauer's review of several studies they noted that "listening to stories contributed to later achievement in literacy" (2003, p. 206). In another study students were given audiotapes with vocabulary words and a sentence and it was noted that hearing while seeing the word made the task of learning vocabulary easier and helped students focus on the spellings of the words as well (Cessar, M., & Treiman, R., 1997). It was concluded that if parents were given the audio resources to help their kids at home, students could learn more vocabulary words and the task should be easier.

Few studies on vocabulary development have involved lower elementary Second Language Learners. The three studies that *did* use Second Language Learners discovered

that the instruction used to explicitly teach English speakers vocabulary was equally effective for teaching English Language Learners (Carlo, et. al 2004; Roberts, 2008; Atay, 2006). However, in 2004, strategies for teaching vocabulary were still limited, Nichols and Rupley (2004) noted that, "the primary strategy used for vocabulary instruction is to focus on the memorization of an arbitrary set list of words. The instructional features typically include looking up the definitions of words in the dictionary, doing some type of skill word (e.g. writing sentences, definitions, word find), and taking a test at the end of the week" (p. 56). This type of instruction has virtually no benefit for English language learning students and often those of low socioeconomic-status because they do not come to the learning situation with the necessary background (Graves, M. F., 2006). This form of vocabulary instruction is familiar to many people because that is the way they were taught in school, yet even for students who speak English, learning words in that way *can* happen, but it is certainly not the most effective method for teaching vocabulary.

By 2007, researchers considered much more effective strategies for teaching vocabulary even to English-speaking children. The strategies include what the Houghton Mifflin Reading (HMR) curriculum (used at the school site for the present study) has developed which includes: direct explanation of the words rather than having children guess, readings that include the words, review of the vocabulary, and contexts where students understand the word in a sentence or story and distinguish whether the words are appropriate in various contexts (Beck, 2007; Gersten, 2000; Graves, 2006; Scott, 2003). Other recent studies agree that this form of deeper word-meaning teaching for vocabulary instruction is necessary in schools, and especially important to employ when teaching

English Language Learners and students with a smaller vocabulary base. In order for vocabulary to positively affect reading proficiency and comprehension, the words must be known in such a way that students can interact with the meaning of the word rather than simply memorize and repeat definitions.

Even from the early parts of history, there has been a focus on helping children learn through the explanation of new concepts. In the New Testament, there are many examples of Jesus needing to explain parables to His followers or those considering His teaching (Matthew 15:15, Mark 4:34, Like 24:27, 32, and John 1:18). Several verses also note that followers of Jesus had to explain difficult concepts to people (Acts 10:8, 11:4, 17:3, 18:26, 28:23). Both current research (Beck, I. L., & McKeown, M. G., 2007; Graves, M. F., 2006; Hart, B., & Risley, T. R., 2003; Roberts, T. A., 2008) and history note the need for effective vocabulary instruction that includes explicit teaching and explanation of the new concepts. The current HMR curriculum includes effective research-based strategies for explaining new vocabulary.

Teaching vocabulary with effective strategies helps students process the new words in a deeper way. This is particularly important for non-readers or students in early primary grades that are learning to decode as they learn new vocabulary. According to Ehri (2005), “if readers attempt to decode words, to analogize, or to predict words, their attention is shifted from the test to the word itself to identify it, and this disrupts comprehension” (p. 170). Teachers, then should teach new vocabulary with the goal of making the words a part of student’s “sight word” understanding where children do not sound out the word, but rather see the word as a whole and recognize the pronunciation and meaning at once. The decision to include a visual of the words, definitions, and

sentences along with the audiotape was made based upon this research that asserts the importance of students identifying the pronunciation and reading together.

The concept of sight word learning is explained by Ehri as a connection forming process where "connections are formed that link spellings of written words to their pronunciations and meaning in memory" (2005, p. 170). According to O'Connor, there are two types of sight words: decodable words, and words that cannot be sounded out because their spellings are irregular (2007). Either of these words could become sight words when "their spellings can be recognized instantly and reading them no longer requires attention to decoding because spelling and pronunciation have become unitized-that is, no attention is paid to the word parts" (O'Connor, 2007, p. 79). Unitization can take place by including spellings, pronunciations, and word meaning explanation in vocabulary instruction. For example, when students hear the word, see the word, learn the meaning and interact with the meaning in context multiple times, they have the foundation for unitization to take place. Then, when they see the word in the future, they connect all the aspects of word learning and immediately recognize the word and meaning in a single step.

Teachers should include written words as part of vocabulary instruction, and students should pronounce spellings so that students can unitize the words and not have to concentrate on the task of decoding (Rosenthal, 2008). There are multiple dimensions to vocabulary knowledge (e.g. partial to precise knowledge of the word, depth of understanding of the word, and receptive and productive use of the word), but its essence is remembering the pronunciations of words and their meanings. Both aspects of vocabulary knowledge, pronunciation and meaning, must be acquired for complete

understanding of the vocabulary word (Rosenthal, 2008). When teaching focuses on word pronunciation and meanings, spellings become bonded or connected to the pronunciations and meanings (Rosenthal, 2008). For the students in Rosenthal's (2008) study, remembering pronunciations was harder than remembering their definitions. Even students with well-developed vocabularies have difficulty learning the production and meanings of words (O'Connor, 2007). Since the task of pronouncing target vocabulary (especially non-decodable vocabulary: such as were, they, your) is highly related to understanding the meaning of the word, the current study examined the effect of context on word learning.

If this is the case for English-speaking second graders in Rosenthal's (2008) study, the difficulty with pronunciations will be significantly greater for English Language Learners who do not hear the pronunciations of most of the targeted English vocabulary at home. First grade students are just learning to read and spend a great deal of attention (i.e. cognitive focus) on sounding out or decoding words, so attention is diverted from understanding meaning. Additionally, "if readers attempt to decode words, to analogize, or to predict words, their attention is shifted from the text to the words itself to identify it, and this disrupts comprehension, at least momentarily" (Ehri, 2005, p. 170). Thus, English Language Learners' comprehension can be greatly affected by not knowing the vocabulary in the text they are attempting to understand. The vocabulary words need to be understood and known well enough that students do not divert any attention from the goal of comprehension to the details of figuring out vocabulary words pronunciation and meaning. When the connection between word learning and word meaning became evident, the decision was made to add a contextual support aspect to the

current study. Thus, there became two experimental groups. One group that heard the words read, along with the definition, and then a simple model sentence for the word along with visual support, and another group that had the same words read with the definition, then a sentence with the word along with the visual support, but they also had a story with the words in context. In both groups the expectation was that students would follow along with the visual aid provided as they listened.

Dual Coding Theory provides some justification for decision to include a visual aid while students listen to the tape or CD in the current study, and explains the benefit that spellings played in Rosenthal's study mentioned above. In Rosenthal's study, twenty second-grade students recalled non-words significantly better when they saw spellings (2008). According to Dual Coding Theory individuals learn words through two primary means: visual and auditory; both of these learning modalities work together to contribute to word knowledge. Thus, students were able to use the spellings to trigger their understanding of the pronunciations. Students need to see, hear, and say unfamiliar words because the use of these modalities strengthens their memory for spellings, pronunciations, and meanings of new words (Rosenthal, 2008). This study therefore used visual representation of the words and sentences to aid students in learning the words well enough to influence comprehension. It was the hope that by providing a visual aid, students could visually and auditorily unitize the new vocabulary, thus pronouncing the word correctly and knowing its meaning in one step if the words were studied frequently enough (i.e. adequate exposures for long-term memory).

After determining that English Language Learners need more meaningful encounters with vocabulary for the learning to enter long-term memory, considerations

were made regarding what *aspects* of the vocabulary would be provided to students during each encounter with the words at home. The need to include context in the interventions became apparent, since in order to make the frequent encounters with vocabulary meaningful, those encounters must be linked to understandable context. According to Jaen's study of the brain and its ability to learn new vocabulary, "we create semantic networks where items relating to the same topic are stored together," and "when processing new information in our working memory its main activity is creating associations and connections between new input and previous stored information we call up from our long-term memory (2005/2006, p. 264). Building these associations and connections of topics can be enhanced through including context.

Providing context along with the words and definitions could help even struggling students understand new vocabulary that is difficult to comprehend or has no visual representation. Students who are just learning to read can understand more sophisticated content through oral language than they can read independently (Beck, I. L. McKeown, M. G., & Kucan, L., 2002). So students may be able to grasp the content of the vocabulary through the context as a story including the important vocabulary is orally read to them, even if they could not read the story on their own. According to Newton, Paddak, and Rosinski (2008), a child's listening vocabulary is about two years ahead of their reading vocabulary, and listening to stories is one of the most effective ways to expand vocabulary. Huyen and Nga (2003) concluded that words should not be learned separately or by memorization without understanding. Providing a tape with only the words and definitions would reflect the expectation that students should memorize the words and their definitions. O'Connor (2007) notes that reading comprehension depends

on “high quality understanding of the meanings of words as well as the ability to read them” (p. 13). With comprehension being the goal of reading, it is essential that students are not only capable of pronouncing the word correctly when reading, but that he or she understands the meaning of that word as well.

Teaching word meanings must be done through exposing students to the words in the context of a story. According to Biemiller and Boote, (2006) instruction of word meanings in context is more effective than word meanings that are not presented in context. Thus, even when teachers provide the meanings of words, effectiveness is lost when those meanings are not shown in context. Additionally, contextualized understanding precedes de-contextualized understanding (Justice, L. M., Meier, J., & Walpole, S., 2005). Therefore, when introducing new vocabulary for students to learn, the words should be in context first, and after the word is learned, students should be able to recognize the words and meaning outside of context. For example, once students understand the vocabulary through encountering the word in context, then he or she should be able to see the word on a card on the wall and pronounce/read the word and explain it’s meaning without the assistance of that context that helped them learn the word initially. Graves (2006) states that the most widely recommended strategy to teach vocabulary is to utilize context. He goes on to note that students learn vocabulary from being read to and having their attention focused on the vocabulary words. Reading aloud promotes vocabulary acquisition and is linked to conceptual knowledge (Roberts, T. A., 2008). The decision was thus made to include context in the experimental interventions of this study in expectation that the added support will suffice to bring about deeper and more vocabulary learning for English Language Learners.

Once it was determined to provide context for the interventions in the current study, further consideration was needed with regard to providing just one context to reinforce the specific meaning students should learn, or to providing multiple contexts and broaden students understanding of the meaning of the word. There have been few classroom studies addressing the issue of context in relation to the benefits of providing one context versus multiple contexts. Biemiller, commented on several studies promoting vocabulary by stating that a word is learned by repetitive exposure to the target word in context, however one study addressed the comparison of one context to multiple contexts by stating that "reading a book several times leads to more word learning than reading several different books once each" (Baumann, J. F., & Kame'enui, E.J. (Eds.)., 2004). Penno, Wilkinson, and Moore (2002) expanded the value of context to note that it is repeated exposures along with the explanation of word meaning that contributes significantly to vocabulary growth. In a study by Biemiller and Boote, students in kindergarten and first grade made 7-10 percent gains on vocabulary assessments when stories containing those vocabulary words were read four times (2006). Likewise in Pearman and Lefever-Davis' (2006) research, *repeated readings* of stories resulted in substantial gains in sight word acquisition. The approach of repeated readings of the same story is essential for students with markedly small vocabularies (Graves, M. F., 2006). Since the majority of students involved in this study fall into the categories of English Language Learner and low socio-economic status, they have depressed vocabularies when compared to students who speak English as their primary language and have higher socio-economic status. Thus, it was concluded that the most effective intervention then

for this study was to have the words in the context of a story, and have that same story read multiple times.

Ancient literature agrees with this concept of meaning being essential to learning since in all instances when repetition of information is mentioned in the Bible, it includes the significance of context. First, there are examples in the Bible of experiences when people hear or see something many times yet still do not understand (Isaiah 6:9, Matthew 13:13-14, Mark 4:12, Luke 8:10, Acts 28:26). In Matthew 15:10 Jesus exhorted the people to hear and understand, thus implying that people can hear information and not comprehend it. In Joshua 1:8 Israel is exhorted to meditate on the law day and night. When information is meditated upon, it is thought about and understanding of meaning takes place, rather than just restating the newly learned information. Similar methods seeking to produce understanding through repetition occur in Koranic schools where students memorize the Scriptures and chant them daily.

In this study, teachers want students to learn the information in such a way that it will positively influence their comprehension. According to the Bible and current research (Graves, M. F., 2006; Green, L. C., 2004; Sagarra, N., & Alba, M., 2006), this cannot be done through just repetition of information, but through interaction with the information and clarification for understanding. This concept is supported by Paul in 1 Corinthians 14:9-11 when he tells people to utter speech that is clear, or it will be meaningless. Paul also showed this concept twice when he states in 1 Thessalonians 1:5 that he taught people not in word only, and in 2 Corinthians 11:6 when he says that he taught people in speech and knowledge, but in “every way” he made the information known. Even in Biblical times, teachers knew that they needed to not only explicitly

teach information, but they desired to provide the context of that information to ensure understanding and true lasting learning (learning that in the case of the Bible meant that the learning influenced the way they lived their lives).

Current research also states that meaning is linked to pronunciation (Ehri, 2005; Rosenthal, 2008). As students understand the meaning of new words, they are able to unitize that information so that they recognize the words as an entire unit as opposed to struggling to decode each word. Since accurate pronunciation and understanding of meaning of weekly Houghton Mifflin Reading vocabulary was the focus of this study, typical vocabulary assessment tools needed to be considered in relation to their ability to meet the exact needs of the study.

In considering the assessment tools to be used in the present study, the emphasis of desired learning (correct pronunciation/reading of the word, and proper use in a sentence) as well as the state required adherence to the HMR program played a major role. Many of the previous vocabulary studies chose to use the Peabody Picture Vocabulary Test (PPVT-a very old test first published in 1959, but updated through different versions) (Biemiller, A., & Boote, C., 2006; Carlo, M. S., August, D., McLaughlin, B., Snow, C. E., Dressler, C., Lippman, D. N., et. al., 2004; Ehri, L. C., & Rosenthal, J., 2008; Justice, L. M., 2002; Justice, L. M., Meier, J., & Walpole, S., 2005; Roberts, T. A., 2008; Karweit, N., & Wasik, B. A., 1996). Of these studies two used the PPVT test to sort groups of students into cohorts (Biemiller, A., & Boote, C., 2006; Justice, L. M., Meier, J., & Walpole, S., 2005). The other studies were either conducted with preschool children and involved identifying illustrations of key vocabulary words, or they included older children and the PPVT was too difficult for first grade students to

complete. Many of the HMR vocabulary words students need to learn do not have a simple visual representation, and the vocabulary words from the PPVT did not match the target vocabulary words in HMR, so the PPVT or any version of the test was not used in this study.

One study involved English students learning Spanish and chose Spanish vocabulary to test, which was immediately ruled out for this research (Sagarra, N., & Alba, M., 2006). Two studies were not conducted in the United States, so their assessment tools were not considered either (Atay, D., & Kurt, G., 2006; Penno, J. F., Wilkinson, I. A. G., & Moore, D. W., 2002). Two other studies involved older students and had vocabulary assessments that were too difficult (Nash, H., & Snowling, M., 2006; Zahar, R., Cobb, T., & Spada, N., 2001). The additional studies researched, either focused on an aspect of vocabulary that differed from word meaning such as how teachers teach vocabulary, reading rate, or pronunciation (Cessar, M., & Treiman, R., 1997; Ehri, L. C., & Rosenthal, J., 2008; Scott, J. A., Jamieson-Noel, D., & Asselin, M., 2003; Tam, K. Y., Heward, W. L., & Heng, M. A., 2006), or the researchers created their own assessment to meet the specific needs of the study (Beck, I. L., & McKeown, M. G., 2007; Brett, A., Rothlein, L., & Hurley, M., 1996; Roberts, T., & Neal, H., 2004; Share, D. L., 2004; Swanborn, M. S. L., & Glopper, K., 2002). After analyzing the purpose of this study which is to assess both word pronunciation and meaning of the target words in the HMR curriculum, it was decided to create an assessment that tests only the target words from HMR while addressing both the pronunciation and meaning of the words in one test.

Though it would be beneficial to conduct broad research using the more typical vocabulary assessment (PPVT), in relation to English Language Learners and low socio-economic students, that broad study would not immediately and directly impact the instruction that is taking place at the school site involved in the present study. However, current research on vocabulary clearly dictates the need for more vocabulary studies of any kind involving English Language Learners and low socio-economic students. Since these groups of children face observed disadvantages in their vocabulary acquisition in relation to their English-speaking peers, the need for current research related to English Language Learners and low socio-economic students is great.

The connection between vocabulary knowledge and comprehension as well as academic success dictates that with more research in the area of vocabulary acquisition, student's comprehension and academic success could be impacted. Those students who struggle in school could be given the tools to succeed if specific strategies can be identified through research in vocabulary instruction and implemented in the classroom. As supported through the research, the greatest need for vocabulary research is in relation to English Language Learners and students of low socio-economic status. These are the students with depressed vocabularies that then struggle with comprehension and ultimately have difficulty succeeding academically. The current research involves both groups of students and seeks to impact the current collection of research in vocabulary instruction in an area of great need.

Chapter 3: Method

Setting and Participants

The present study was conducted in a public elementary school in Southern California with an enrollment of approximately 850 students including the public preschool on campus. Eighty-three percent of the students are identified by the school district as English Language Learners, and ninety–one percent of the students qualify for free and reduced lunch, indicating a low socio-economic status. The study was confined to first grade students at the site. Students from all the first grade classes were asked to participate in the study. Of the six first grade classes requested to participate, all participated; however one teacher was unable to collect the necessary data to contribute. Thus, 91 first grade students from five different classes participated in the study. This was a pilot study. Because it was a pilot study with a non-random population, the results of the study cannot be generalized to the larger population.

Since the participants were minors they were told of the study and their parents were invited to an informational meeting about the study after which they were asked to sign a consent form for their child to participate. The classes were voluntarily divided into three separate groups based on teacher and researcher preference. Group 1 became the control group. Group 2 became the first experimental group and Group 3 was another experimental group.

Teachers of Group 3 participants taught the vocabulary components of the Houghton Mifflin Reading Curriculum as outlined in chapter one in accordance with all Reading First Assurances and daily guidelines stipulated in the Teacher's Edition of the Reading curriculum. Group 3 also included the extra support strategies dictated in chapter

one that are employed at the site involved in the current study during universal access time each day. Group 3 teachers also agreed to assess their students individually every week for six weeks, asking each student to pronounce/read each vocabulary word, and provide a sentence including each word for the week.

Group 2 teachers were required to do everything that group one teachers agreed to, but they were also provided with a tape or CD made by the researcher that had each vocabulary word pronounced, a definition, and a sentence that accurately used each target vocabulary word. The vocabulary word was verbally emphasized in the sentence and then repeated after the sentence. Each student received the tape or CD and a folder with the visual representation (Appendix B) of everything that was said on the tape, so they could follow along with what they were hearing. Teachers sent the folders and tape or CD home on Monday and collected them on Friday for the last three weeks of the study. On Monday of the first week of the three-week intervention, the classroom teacher modeled exactly how to follow along with visual while listening to the tape or CD in class.

Group 3 teachers were given the most responsibility for the study. They agreed to all that the previous two groups committed to, but they were also asked to send home the anthology book from Houghton Mifflin. The anthology includes stories that have the vocabulary words for each week in context. With the permission of the Houghton Mifflin Reading Company the stories were read and recorded by the researcher. So, each Group 3 student received a tape or CD with the vocabulary word pronounced, the definition of each word, and a sentence accurately using the target word and the visual aid for students to follow along while listening to the tape (Appendix B). Then on the tape the researcher read the Houghton Mifflin story for those vocabulary words while the children were

asked to follow along in their book. When the story was finished, the researcher asked the students to locate each word in the story using a view window as every word was stated again. The view windows were just pieces of paper cut to the size of the book with a hole cut in the middle, roughly the size of each high frequency word that the children were expected to find. Each week students read a different HMR story to provide the context for the new vocabulary words. The stories for each week of intervention were as follows:

Week of Intervention	Story
1	*Who's in a Family?* - Written by Sheila Kelly and Shelley Rotner, photographs by Shelley Rotner.
2	*The Best Pet* - Written and illustrated by Anna Rich.
3	*Bud's Day Out* -Written by Brian Karas, illustrated by Clive Scruton.

Teachers showed the students how to find each vocabulary word in the story and use the view window to frame each word individually as it was read on the tape. The classroom teacher modeled this process in class on the Monday of the first week of the three-week intervention.

Assessments

The baseline and experimental assessments (see Appendix B for a sample of one assessment) were each created directly from the first grade Houghton Mifflin Reading high frequency words identified in the corresponding Teacher Guide, and the Sacramento County Office of Education: 6-8 Week Skills Assessments Developed for Districts Using Houghton Mifflin Reading developed in 2008 by the Reading Lions Center (SCOE) assessments testing first grade understanding of the high frequency words. The vocabulary words to test each week were determined from the high frequency words

children are required to learn each week for the Houghton Mifflin Reading program. The way to assess students understanding of each vocabulary word was based on the SCOE assessments for Reading First schools. The SCOE consists of four main sections: spelling/phonics where students choose the correct spelling of a word that the teacher reads, word reading where students determine which vocabulary words can be associated with a picture provided, a fluency section where students accurately and quickly read passages that include new vocabulary words (students are stopped after one minute of reading and assessed on the number of words read correctly in that minute), and a final section of writing where students are expected to use current vocabulary in their writing. On the SCOE, children must understand the words pronunciation through reading the word and identify the meaning of the words through reading a passage and answering comprehension questions about the readings. Thus, on the assessments designed by the researcher students were shown the spelling of the words and asked to pronounce each word by the classroom teacher, indicating their ability to read the word. After completing the pronunciation assessment, participants were asked to use each vocabulary word in a sentence. The classroom teacher wrote down the child's sentence exactly as the child said it. The baseline and intervention assessments followed this same format of word reading/pronunciation and use in a sentence, just with different vocabulary words. The assessments were confined to the pronunciation and reading of HMR vocabulary words and included them in a sentence rather than assessing student's general vocabulary knowledge, since the HMR specific vocabulary words were what prompted the hypotheses and discovered areas of need for students at this specific site. Teachers were shown the assessments and intervention tools during several monthly meetings. The

meetings were already required for all first grade teachers, and time was given to the researcher to demonstrate how to model proper use of the intervention tools, to explain the assessments and the process of recording in writing the sounds and sentences that students gave, and to explain the purpose of the study and possible future implications.

The assessments were conducted on Friday of the week the vocabulary words were introduced. If a child was absent the assessment was given the day that the child returned. There were a total of six weeks of assessments. The first three weeks provided the baseline for the data and the last three weeks were the intervention weeks that provided the experimental data. This decision was made because the majority of difficulties noticed in high frequency word learning at the site occurred during the previous year in last three weeks of the unit of study, so it was decided that the intervention would be most effective when implemented during the weeks of typically greatest need as demonstrated by previous first grade students utilizing the same curriculum. The first three weeks served as the baseline to see if students during this study did better on the second three weeks of the research.

The assessments of pronunciation were graded based on the correct number of phonemes each student produced. Thus, if the students pronounced the entire word correctly he or she received the number of points in accordance with the number of phonemes contained in the word. If a student missed some of the phonemes they were given a numerical credit for any of the phonemes said correctly in the proper position of the word. For example, if a student was asked to pronounce the word “picture” and only said “p,” he or she was given one point of the five possible points for the phonemes in the word. However, if a student was asked to pronounce the word “picture” and said “rp,” he

or she would not receive any numerical credit since the p and r phonemes were not ordered correctly.

The assessments of sentences were graded in two ways. First, students were given one point for using the word correctly in the sentence in accordance with the definition taught in class. If a child made the word plural in the sentence, they were given the one point they could receive for correct usage of the vocabulary word. If a student used the target vocabulary word incorrectly in the sentence, they were given a zero. Students who gave an incomplete sentence were not given any credit for the sentence, even if the word was used correctly in the part of the sentence that was stated. For example, if the target word was picture and the child's sentence was "the picture," the child received a zero. The second aspect of grading sentences was that students were given one point for each syllable their sentence contained, indicating the complexity of their sentence and the degree of their understanding of the vocabulary word. It is important to note that if a student used the word incorrectly in their sentence, none of the syllables in that sentence were counted.

Procedures

Students in all five of the first grade classes participating in the study taught the Houghton Mifflin Reading high frequency words as stated in chapter one in accordance with all Reading First Assurances, daily guidelines stipulated in the Teacher's Edition of the Reading curriculum, and including the extra support strategies dictated in chapter one that are employed at the site involved in the current study during universal access time each day for three weeks. Then teachers in Groups 2 and 3 were instructed in the use of the intervention tools for students to take home every day. Group one teachers continued

the same high frequency word instruction with no further intervention; teachers in groups two and three sent home the interventions daily on Monday through Friday for the second three weeks of the study.

Experimental Design

The variables addressed in the study: 1) multiple exposures to new vocabulary words and 2) multiple exposures to new vocabulary words in context. Theses variables were analyzed first in relation to each other, in relation to children's CELDT level (students tested level of English understanding) and then in relation to age. Since Group 1 students received no intervention their mean scores were compared with the mean scores of Group 2 students. Since Group 2 students received multiple exposures to the words at home while Group 3 students received multiple exposures to new vocabulary words in context the mean scores of Group 3 students were compared with the mean scores of Group 2 students and Group 1 students. In relation to CELDT level, each CELDT level's mean was compared with each other, while noting what group the participant was in to discover if the varied level of support affected one CELDT level more or less than another. The final form of analysis was in relation to age. Students of similar age's mean scores were compared also in relation to their group to determine if the level of support affected any particular age group more or less than another.

Chapter 4: Data Analysis

Grouping of Data

Four basic spreadsheets were used to input initial data. To ensure reliability and consistency, the researcher graded all assessments and inputted the information into the Excel spreadsheets. Students received points in three areas: pronunciation of the vocabulary word (WR) indicating word recognition, correct usage of the word in a sentence (U) indicating usage, and the complexity of the sentence they stated (C) indicating complexity. Students were given a score for the pronunciation of each word (WR), with the total number of points possible being the number of phonemes in each word. Then students were given a score of one or zero for word understanding (U). If the student understood the word and used it correctly in the sentence, he or she received a score of one and if he or she did not use the word correctly in the sentence, he or she received a zero. Last, students were given a complexity (C) score for the number of syllables their sentence contained. Each aspect indicating word understanding (WR, U, and C) was imputed into a different spreadsheet.

Decisions of grading were consistent with all concepts mentioned in chapter three. So, students who gave incomplete sentences were not given any credit for the syllables in the complexity (C) score, and students were not given points if phonemes were in the wrong place when pronouncing and reading the word. Each assessment included eight or nine words, and there were six assessments total (three for the baseline data and three for the intervention data).

Data was then grouped in a summary excel spreadsheet where each participant was assigned a number. Students then received an “m” if they are male and an “f” if they

are female. Home language was given a number: one for Spanish, two for English and 3 for Arabic. Each participant's CELDT level was noted with a number 1-6. One indicates the least amount of English acquisition all the way to five, which indicates more English acquisition, and then six was assigned to students who only speak English. Since the study involves first grade students, none of the students at the site have progressed enough in their English acquisition to be re-designated as English students (e.g. no students in first grade at the school site involved in the study were English Language Learners at one point and then acquired enough English to be moved to the EL Proficient group). Next, each teacher was assigned a number 1-5, and a group number 1-3 corresponding with the group of intervention to which they were assigned. Each of these numbers: the teacher and group were noted on the spreadsheet. Last, student's age was calculated in months and included in the summary data sheet as well.

At the bottom of the summary spreadsheet, participant's scores were averaged for each of the assessments. Three averaged scores (A1, A2, A3) in each category of word understanding (WR, U, and C) were used for the baseline data and three averaged scores (A4, A5, A6) in each category of word understanding (WR, U, C) were averaged for the intervention data. These averages were then averaged together again to determine a mean baseline score and a mean intervention score. Finally, the mean baseline score and the mean intervention scores were compared to discover the difference. After entering all the data into the three basic spreadsheets and computing the summary spreadsheet, the data was graphed according to the different research questions in each of the three areas: WR, U, and C to determine the results. See Appendix A for a sample of the summary spreadsheet.

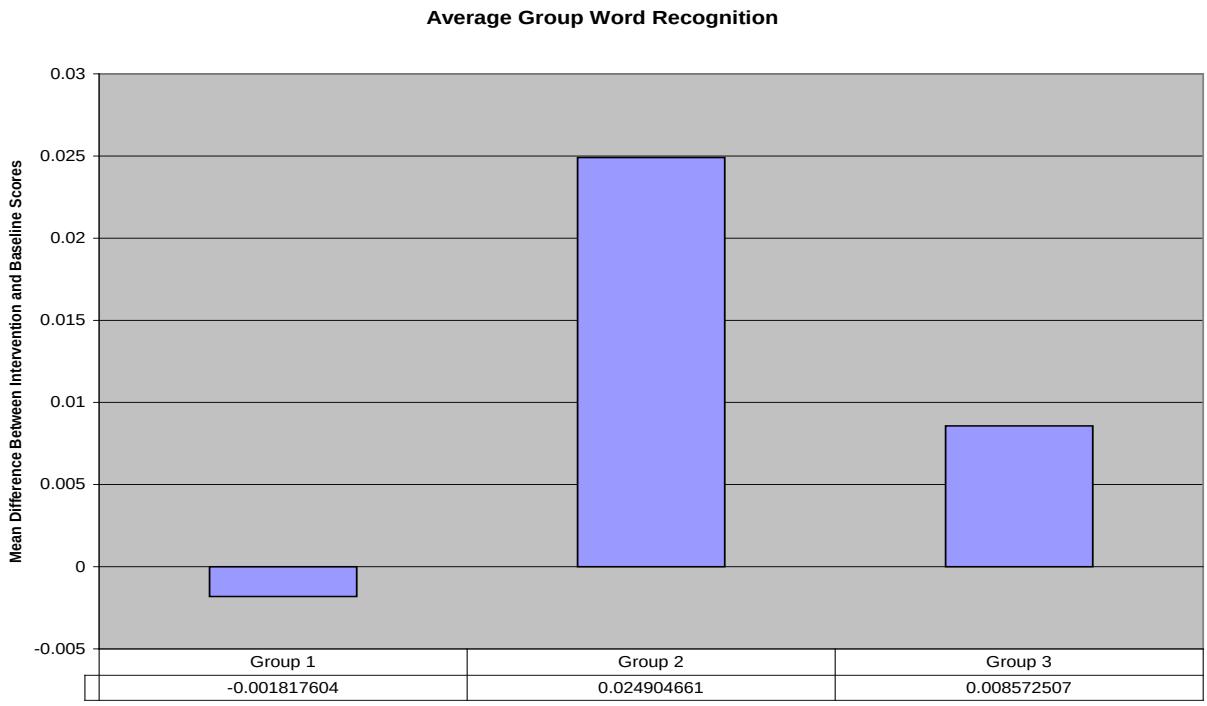
Question 1

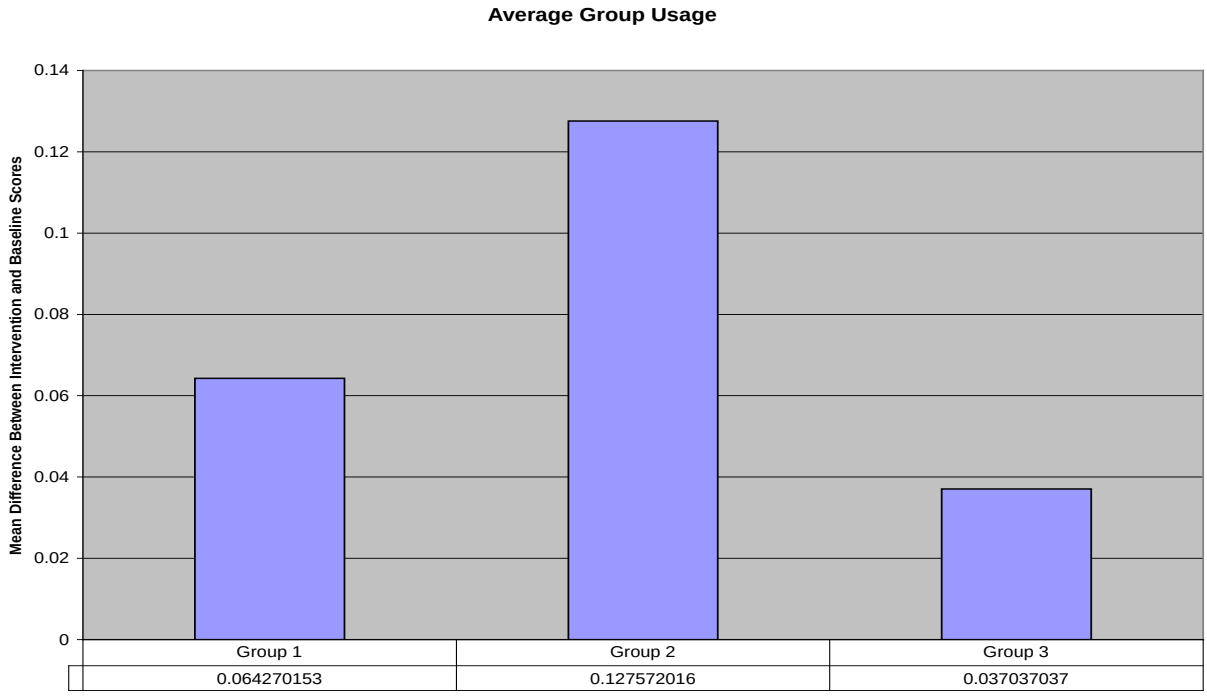
Do multiple exposures and/or context positively impact student pronunciation and/or understanding of word meaning?

Question one asked if multiple exposures to words and/or context positively impact student pronunciation and/or understanding of word meaning. To consider the response to this question (see Figure 1), participants were sorted by the group they were in for the study: Group 1 students are participants in the control group who received no intervention (no intervention), Group 2 students are those who received the intervention of the words with definitions and sentences on tape each night (multiple exposures intervention), and Group 3 students are those who received the intervention of words with definitions and sentences *along with* stories including the words in context on tape each night (context. intervention) The average differences between intervention and baseline scores for students in each group were graphed. Data was finally grouped according to the three areas of word understanding: pronunciation (WR), correct usage of the word in a sentence (U), and the complexity of the sentence stated (C) to better determine what specific aspects of word understanding were affected by multiple exposures and/or context. For these comparisons, there were 34 students in Group 1, 9 students in Group 2, and 17 students in Group 3. Though 91 first grade students participated in the study, 31 students' scores were not considered in the graphs of averages, because they had incomplete data sets with one or more of the six assessments missing. It was decided that the validity of the data would be affected if the 31 students were added and given substituting values for the missing cases. Thus, 60 students were considered in the graphs. Figure 1 shows all three graphs with the mean differences for each group:

Figure 1

Three Graphs Comparing Average Growth of Each Experimental Group in Word Recognition (WR), Word Usage (U), and Complexity of Sentences (C).





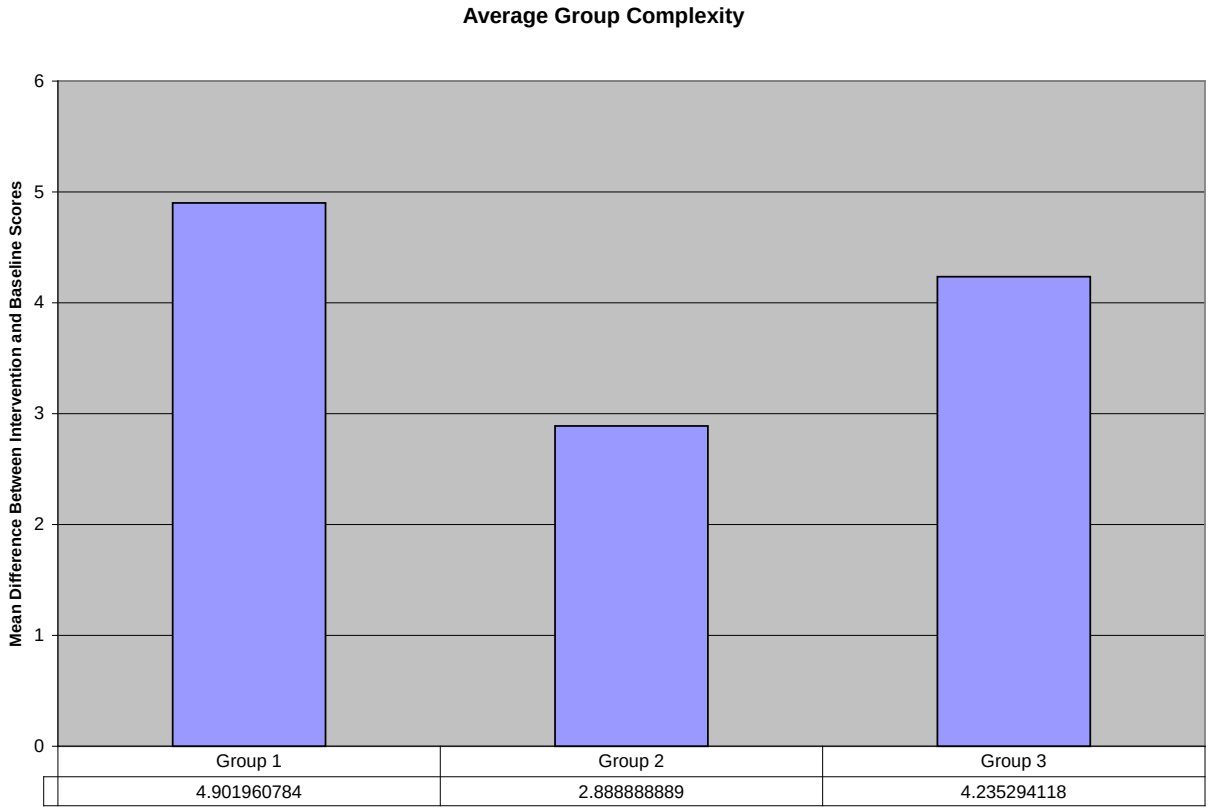


Table 2

Comparing Mean Scores between Students Who Received Multiple Exposures Intervention and Students Who did not receive any Intervention.

Mean Word Recognition (WR) (Group 2 – Group 1)	Mean Usage (U) (Group 2 – Group 1)	Mean Complexity (C) (Group 2 – Group 1)
0.026722265	0.063301864	-2.013071895

*Note: Group 2 – Group 1 indicates the difference between the mean scores of students in intervention group 2 (those who received multiple exposures intervention) and the mean scores of students in intervention group 1 (those who did not receive any intervention).

Since multiple exposures to the vocabulary words were given to Group 2, that average was compared to the average of Group 1, the control group receiving no intervention. Table 2 dictates the specific mean differences between Groups 2 and 1 in

each area WR, U, and C. It can be seen from Figure 1 and Table 2 that students in Group 2 who received multiple exposures to vocabulary words at home improved more than students who did not receive any intervention and improved more than those who received the context support in the areas of word pronunciation (WR) by an average of .026722265 and word usage (U) by an average of .06301864. However, students in Group 2, who received multiple exposures, did not improve in the area of the complexity of the sentences they stated (C) by an average decrease of -2.013071895. Thus, multiple exposures improved student's pronunciation of words and improved their understanding of the meaning of the word, but multiple exposures did not improve the complexity of their sentences. This could be since none of the interventions were intended to build more complex understanding of the words, but rather to reinforce the initial understanding that students at the school site in previous years were not grasping. The complexity score could also be due to chance since the complexity score was not statistically significant.

It is also important to note that when Chi Squares were conducted with the data used to create the graphs in Figure 1, the only statistically significant difference was in Usage. Table 3 is the Chi Square of Group Comparison in the correct usage of the vocabulary words. As noted in the Chi Square chart below Table 3, the Chi Square for differences in usage growth was 8.574. With a df of 2 the difference was significant at the .05 level as defined by the Chi Square Distribution chart found at http://www2.lv.psu.edu/jxm57/irp/chisquar.html to determine statistical significance. On the website, an alpha level of .05 was used for all statistical tests. The Chi Squares for the other two areas of word learning tested (WR-pronunciation, and C-complexity) were not statistically significant and can be viewed in Appendix D. After considering statistical

significance, the students in Group 2 who received multiple exposures to vocabulary words at home improved more than students who did not receive any intervention in the area of word usage. Multiple exposures to words increased student's ability to use words correctly in a sentence. Thus, it can be concluded that students who received multiple exposures to words understood the meaning of those vocabulary words more than those who did not.

Table 3

Chi Square of Group Comparison in Usage.

Table of Observed Frequencies: Group Comparison U

Group	Progress	No progress	Total	Expected Progress	Expected No Progress
1	19	15	34	19.83	14.17
2	9	0	9	5.25	3.75
3	7	10	17	9.92	7.08
Total	35	25	60	35	25

Chi Square

Group	Observed	Expected	O-E	(O-E)2/E
1 progress	19	19.83	-.83	.035
2 progress	9	5.25	3.75	2.68
3 progress	7	9.92	-2.92	.86
1 no progress	15	14.17	.83	.049
2 no progress	0	3.75	-3.75	3.75
3 no progress	10	7.08	2.92	1.20

Chi square = 8.574
df = 2

Figure 1, Table 3, and Table 4 address the issue of *context* to word learning (e.g. the effects of hearing words multiple times in context on word learning). Group 3 received the context intervention. In considering the impact of context on word learning, Group 3 will be compared to both Group 2 (those who received only multiple exposures intervention) and Group 1 (those who received no intervention).

First, comparing Group 3 with Group 2, the only area where context improved student achievement with words was in the complexity (C) of student's sentences. The first score of Table 4 under Mean WR, Mean U, and Mean C provides the exact mean differences between Group 3 and Group 2 in each of the areas of word learning assessed. The scores for mean WR, U and C were -0.0163, -0.0163, and -0.01641. Table 4 shows that students in Group 3 improved less than students in Group 2 in the areas of WR and U however, according to Table 3, the U score was the only score with statistical significance, indicating that multiple exposures to words and definitions were more valuable than context for word usage (e.g. meaning) for these first grade English Learners.

Next, in comparing Group 3 with Group 1, students with no intervention improved more in the areas of usage (U) and complexity (C), which is why the second box numbers under Mean U and Mean C in Table 4 are negative, but in the area of word pronunciation (WR), students in group three with the context intervention improved by .01039 more than the students who did not have any intervention. Since usage was the only aspect of word learning that had statistical significance, it can be concluded that students receiving no intervention improved more in the area of word usage or their

understanding of the meaning of words that students who received context intervention. This finding could result from students hearing the same story so many times that they got bored with the intervention and either did not utilize the intervention at home, or ignored much of the information while listening to the tape or CD. Another possible explanation might be that the context intervention did not hold enough contextualized meaning for this population of students who were primarily English Learners. Comprehensibility of the intervention strategy is essential.

Table 4

Comparison of Students who Received Context Intervention with Students who Received Multiple Exposures Intervention and with Students who did not Receive any Intervention.

Mean Word Recognition (WR)		Mean Usage (U)		Mean Complexity (C)	
(G 3-G2)	(G3-G1)	(G3-G2)	(G3-G1)	(G3-G2)	(G3-G1)
-0.0163	0.01039	-0.090535	-0.0272	1.34641	-0.6667

*Note: G3-G2 is the difference of mean scores between students of intervention group three (those with context intervention) and students of intervention group 2 (those with multiple exposures intervention). G3-G1 is the difference of mean scores between students in group three (those with context intervention) and students in group one (those with no intervention).

Question 2

Do multiple exposures to vocabulary words and/or context positively affect word pronunciation and/or understanding of word meaning for English Language Learners? Is the impact of multiple exposures and/or context the same or different for English Only students compared to English Language Learners?

Question two considers English Language Learners and English only students in relation to their improvement in word pronunciation and word understanding with the interventions of multiple exposures and context. The graphs (see Figure 2) to address

these questions used the average change between the three intervention assessments and the three baseline assessments. All English Language Learners were grouped together, and all English only students were grouped together. Figure 2 shows the graphs of these two groups: English Language Learners and English only students divided by the group they were in for the study. ELL's Group 1 is all the English Language Learners in Group 1, (the control group with no intervention). ELL's Group 2 is all the English Language Learners in Group 2, (the group that received the multiple exposures intervention), and ELL's Group 3 is all the English Language Learners in Group 3, (the group that received the context intervention). EO's Group 1 is all the English Only students in Group 1, (the control group with no intervention), and EO's Group 3 is all the English Only students in Group 3 (the group that received the context intervention). The graphs do not include an EO (English Only) graph for group two because there were no English Only students in group two for this study. Table 5 shows how many students were in each group. Again, though 91 students agreed to participate, 31 scores were not considered because of incomplete data sets. Thus, 60 students were used for these graphs and averages.

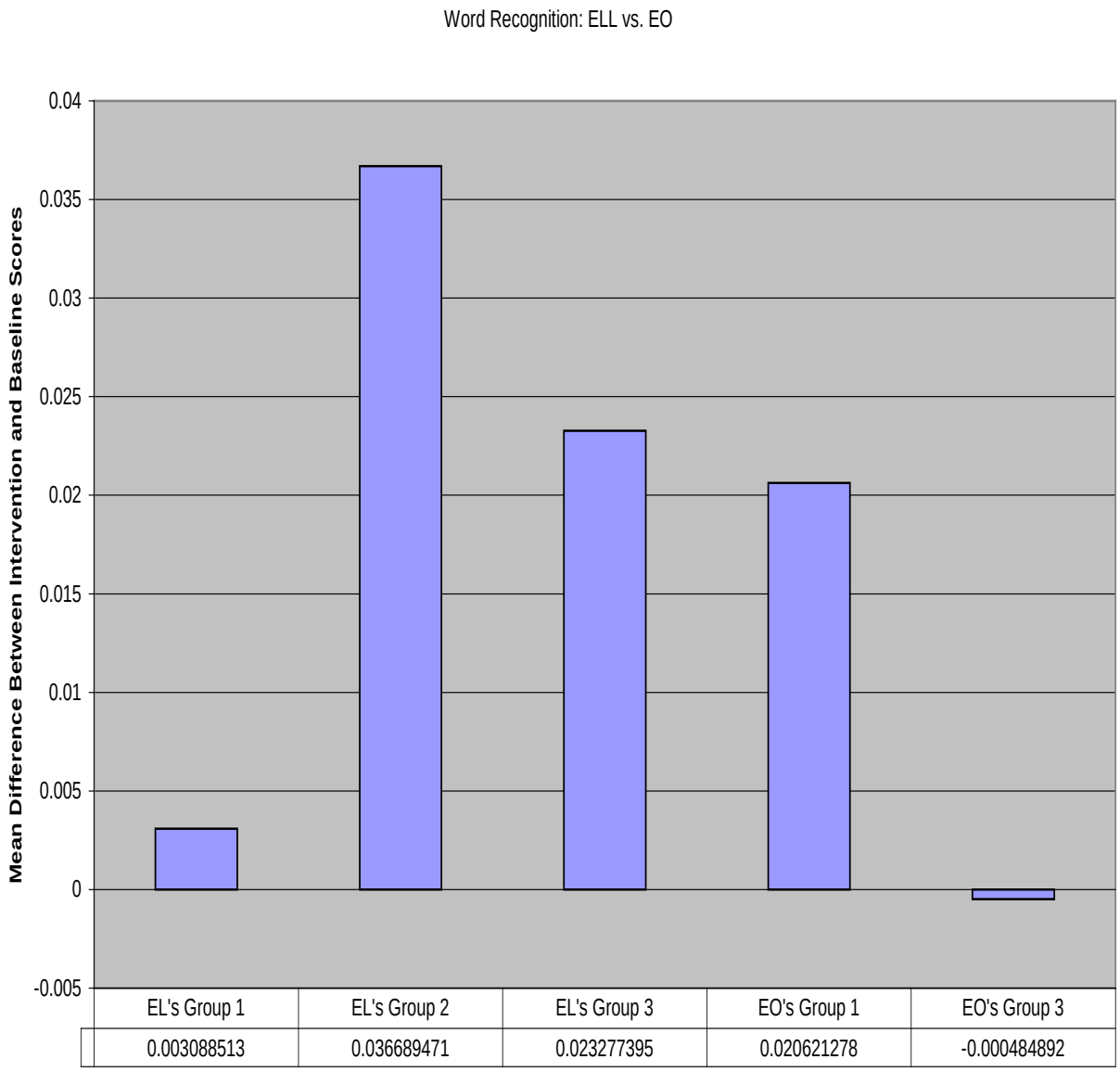
Table 5

The Number of Students in Each English Language Learners Group and English Only Group.

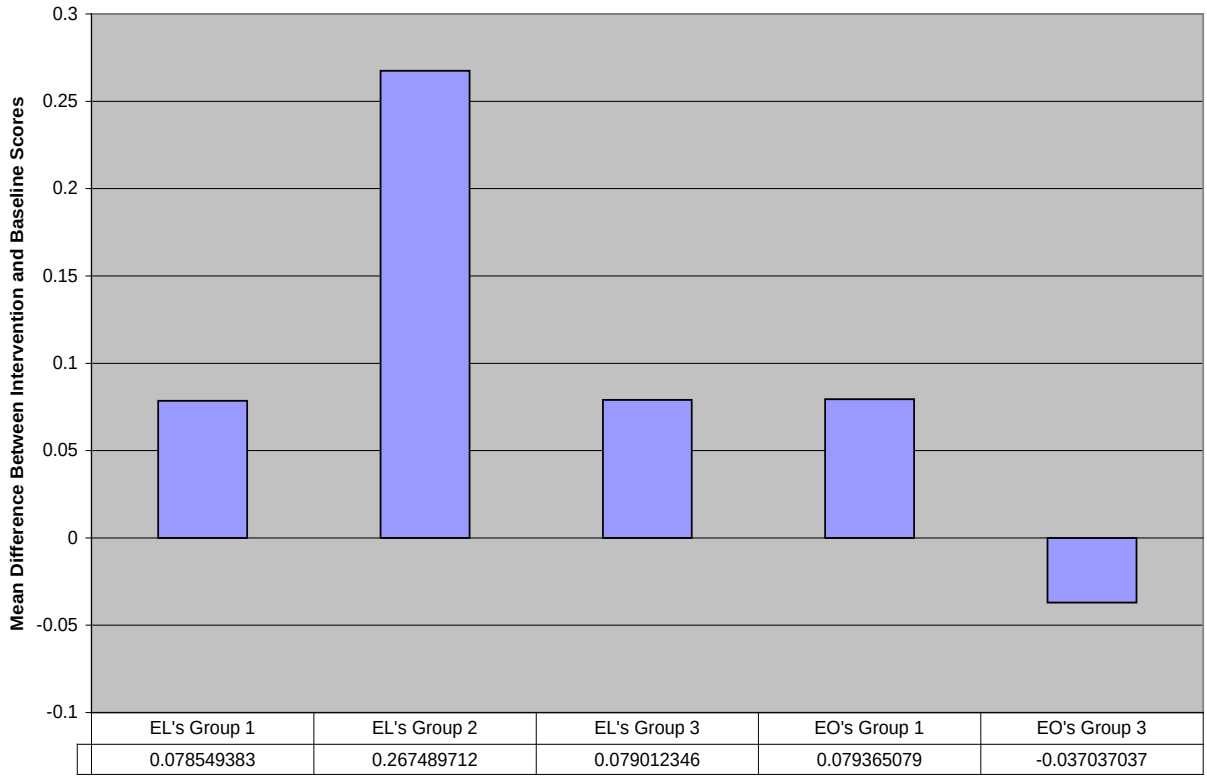
Group Students	English Language Learners	English Only
1	27 students	7 students
2	9 students	0 students
3	14 students	3 students

Figure 2

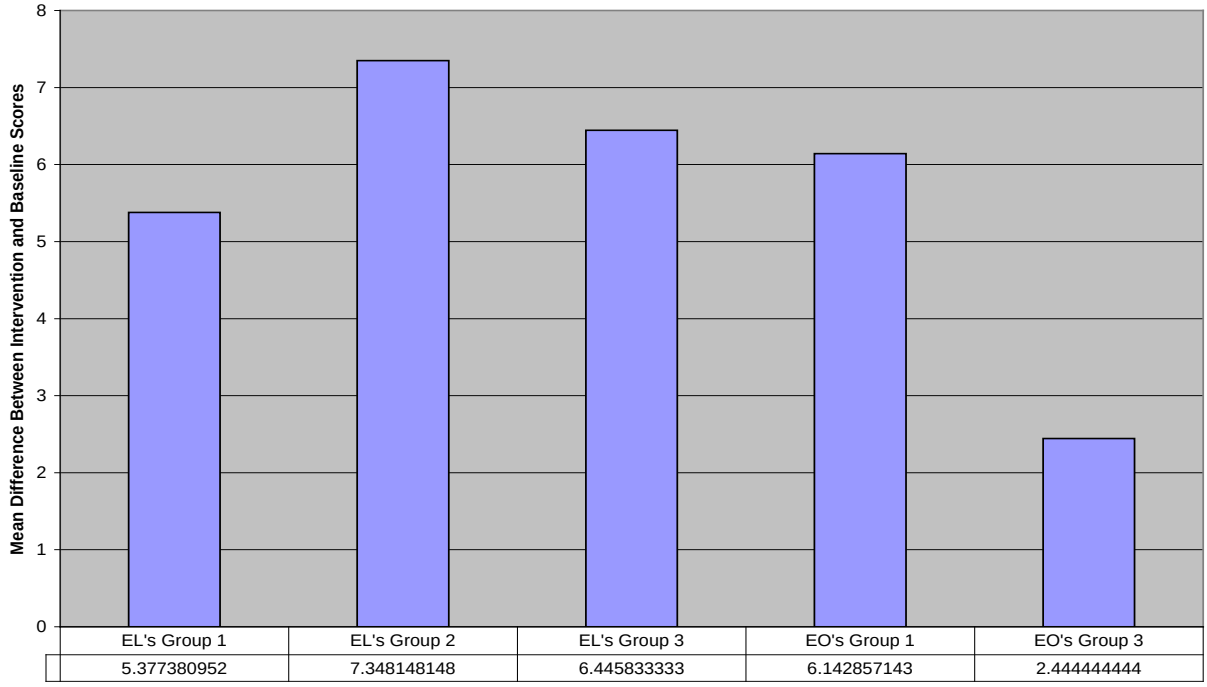
Three Graphs Comparing Average Growth in Word Recognition (WR), Word Understanding (U), and Complexity of Sentences (C) for English Language Learners and English Only Students in each Group of Intervention.



Usage ELL vs. EO



Complexity: ELL vs. EO



From the graphs in Figure 2 it can be seen that English Language Learners in Groups 2 and 3 made more average growth than English Language Learners in Group 1 in all areas of word understanding tested (WR, U, and C). Students in Group 2 received multiple exposures to the vocabulary words, and students in Group 3 received multiple exposures and context intervention. Both Groups 2 and 3 showed more growth than Group 1 with no intervention. Thus, multiple exposures and context positively affect word pronunciation and understanding for English Language Learners. Additionally, the graphs in Figure 2 show that English Language Learners in Group 2, the group that only received the multiple exposures intervention, made more gains than English Language Learners in both Groups 1 and 3 in all three areas of word understanding tested (WR, U, C). Thus, English Language Learners benefited most from multiple exposures to vocabulary words. It must be noted, however that none of the data comparing the English Language Learners scores was statistically significant. Therefore, the average results will not be considered in the conclusions. These Chi Squares can be viewed in Appendix E.

To discuss the next aspect of question 2, the graphs in Figure 2 were looked at in relation to the English Only students. It can be seen that in all areas of word learning (WR, U, C) assessed in this study, the English Only students did not improve with the context intervention. The only two groups compared were English Only students in Group 3 and Group 1 because there was not an English Only Group 2. Since classes were randomly assigned to groups, there were not any English Only students in Group 2. The findings comparing the context intervention (Group 3) with the control group (Group 1) show that students in the control group actually made greater gains than those with the context intervention. Thus, the impact of context was different for English Only students

and English Language Learners. English Language Learners benefited from multiple exposures and context intervention, while English Only students did not benefit from context intervention. An important consideration to make is that when Chi Squares were conducted to analyze the statistical significance of the differences, only one aspect of word learning was close to statistical significance. Chi Square for Usage was 7.99 and was only statistically significant at the .2 level (according to the chart found at http://www2.lv.psu.edu/jxm57/irp/chisquar.html), which could not be used to rule out the differences occurring only by chance. Table 6 shows this Chi Square:

Table 6

Chi Square Comparing English Language Learners and English Only students in the Usage of Vocabulary Words.

Table of Observed Frequencies: ELL Vs. EO: U

Group	Progress	No progress	Total	Expected Progress	Expected No Progress
ELL 1	15	12	27	15.3	11.7
ELL 2	8	1	9	5.1	3.9
ELL 3	7	7	14	7.93	6.07
EO 1	4	3	7	3.97	3.03
EO 2	0	0	0	0	0
EO 3	0	3	3	1.7	1.3
Total	34	26	60	34	26

Chi Square

Group	Observed	Expected	O-E	(O-E)2/E
ELL 1 progress	15	15.3	.3	.006
ELL 2 progress	8	5.1	2.9	1.65

ELL 3 progress	7	7.93	-.93	.109
ELL 1 no progress	4	3.97	.03	.00002
ELL 2 no progress	0	0	0	0
ELL3 no progress	0	1.7	-1.7	1.7
EO 1 progress	12	11.7	.3	.007
EO 2 progress	1	3.9	-2.9	2.16
EO 3 progress	7	6.07	.93	.142
EO 1 no progress	3	3.03	.03	.00003
EO 2 no progress	0	0	0	0
EO 3 no progress	3	1.3	1.7	2.22

Chi square = 7.99405
df = 5

Therefore, the only area where English Only students did not benefit from context intervention was in their understanding of the meaning of the word. A possible explanation could be because the intent of the interventions was to build initial understanding of the vocabulary words and their pronunciation rather than broaden an already existing understanding of the words and their meaning. Since the majority of vocabulary words are high frequency words (they occur often in conversation or reading for native English speakers), most of the English Only students already knew the words and their pronunciations. It was also not communicated to any of the students involved in the study that the teachers were analyzing their sentences for complexity, because the

researcher sought to discover if the interventions themselves helped improve mainly English Language Learners understanding of how to use the words in a complete sentence. Additionally, the assessments in the current study involved growth in all areas of word learning, and many of the English Only students used the words correctly in both the baseline and intervention assessments, so there would not be any *growth* shown on a graph of comparisons. They learned all the words each week, thus showing no growth from baseline to intervention.

Often the English Language Learners at the school site involved in the study obtain a narrow understanding of the meaning or the word where they can identify the meaning, but not create a complete sentence using the word correctly. For example, if the vocabulary word was “know” an English Language Learner at the school site might be able to say “I know” (a sentence fragment), but when asked to give a complete sentence would say “I no go to the park” (a sentence, but now indicating a misunderstanding of the word). Additionally, English Language Learners at the school site often do not know that they are providing an incomplete sentence. Thus, the interventions were designed to help English Language Learners understand the meaning and pronunciation of vocabulary words in complete sentences, with the expectation that the interventions would then help English Language Learners produce complete and accurate sentences with new vocabulary. By understanding the intent of the interventions, it is not surprising that English Only students did not benefit from the context interventions. They already know the basic structure of sentences in English and the meaning of the vocabulary words, and were not asked to produce the most complex sentence they could while still using the vocabulary word correctly.

Interestingly, in looking at Figure 2, English Language Learners with the interventions (either multiple exposures or context) made greater gains than the English Only students in all areas of word understanding assessed in the present study. However, English Language Learners who did not receive any intervention showed less growth than any of their English Only peers (those with or without the intervention). This is likely since English Language Learners have less understanding of English sentence structure and vocabulary than their English Only peers, and without interventions they are at a disadvantage in their vocabulary acquisition and in their ability to produce complete sentences using vocabulary correctly. So, the interventions were beneficial for English Language Learners. It is also intriguing to note that when comparing the English Only students who did not have any intervention (EO's Group 1 on the graph in Figure 2) with the English Language Learners who also did not have any intervention (EL's Group 1 on the graph in Figure 2), the growth of the English Only students was greater in all areas tested in this study, further confirming the benefit of multiple exposures and/or context for English Language Learners. It should also be noted that English Language Learners in Group 2 (those who only received intervention of multiple exposures) made the greatest gains of any of the groups. So, multiple exposures to words, their definitions, and simple model sentences with the words positively impact word learning for English Language Learners. However, due to statistical significance shown in Table 5, the conclusion can be made that multiple exposures to words, their definitions, and simple model sentences with the words positively impacts English Language Learners' understanding of the meaning of new vocabulary words.

Question 3

Does the number of encounters needed to learn new words vary with CELDT level proficiency? Does CELDT level affect the impact of context on word learning (meaning or pronunciation)? Will students of higher or lower CELDT level benefit more from hearing the words in context?

The graphs to address these questions (see Figure 3) used the average change between the three intervention assessments and the three baseline assessments. The students mean improvements between these two tests were first divided by English Language Development Level (CELDT), and then sorted according to the group of intervention they were in for the study. As previously stated, students were given a number 1-5 corresponding to their level of understanding of English. One indicates the least understanding of English, and five indicates the most understanding of English. The number six was also given for students who speak only English. So, on the graph, when it says ELD 1-1 that would indicate students who are a CELDT level one (those with the least amount of English knowledge) and in Group 1 receiving no intervention. Then when it says ELD 1-2, that would indicate students who are a CELDT level one (those with the least amount of English knowledge) but in Group 2 receiving the multiple exposure intervention. Likewise, when it says ELD 1-3, it indicates students who are CELDT level one (those with the least amount of English knowledge) but in Group 3 who received the multiple exposure and context intervention. The groupings continue in the same way for all CELDT levels and groups. So the next category on the graph would be ELD 2-1, indicating students who are CELDT level two (slightly more English knowledge) and in Group 1. It can be noted that some of the groups are missing: ELD 2-2, ELD 5-1, ELD 5-

2, ELD 5-3, and ELD 6-2. These groups are missing because there were no students in that group to assess. Table 7 explains how many students are in each CELDT level (1 being the least amount of English knowledge to 5 being the most amount of English knowledge and 6 being English Only) and group of intervention (1=control group with no intervention, 2=multiple exposures intervention, 3=context intervention). The number of students indicates the number of scores that were averaged for each of the CELDT levels and groups to obtain the graphs in Figure 4. As with previous graphs, though 91 students were assessed, only 60 were considered in these graphs and shown in the tables because of incomplete data sets.

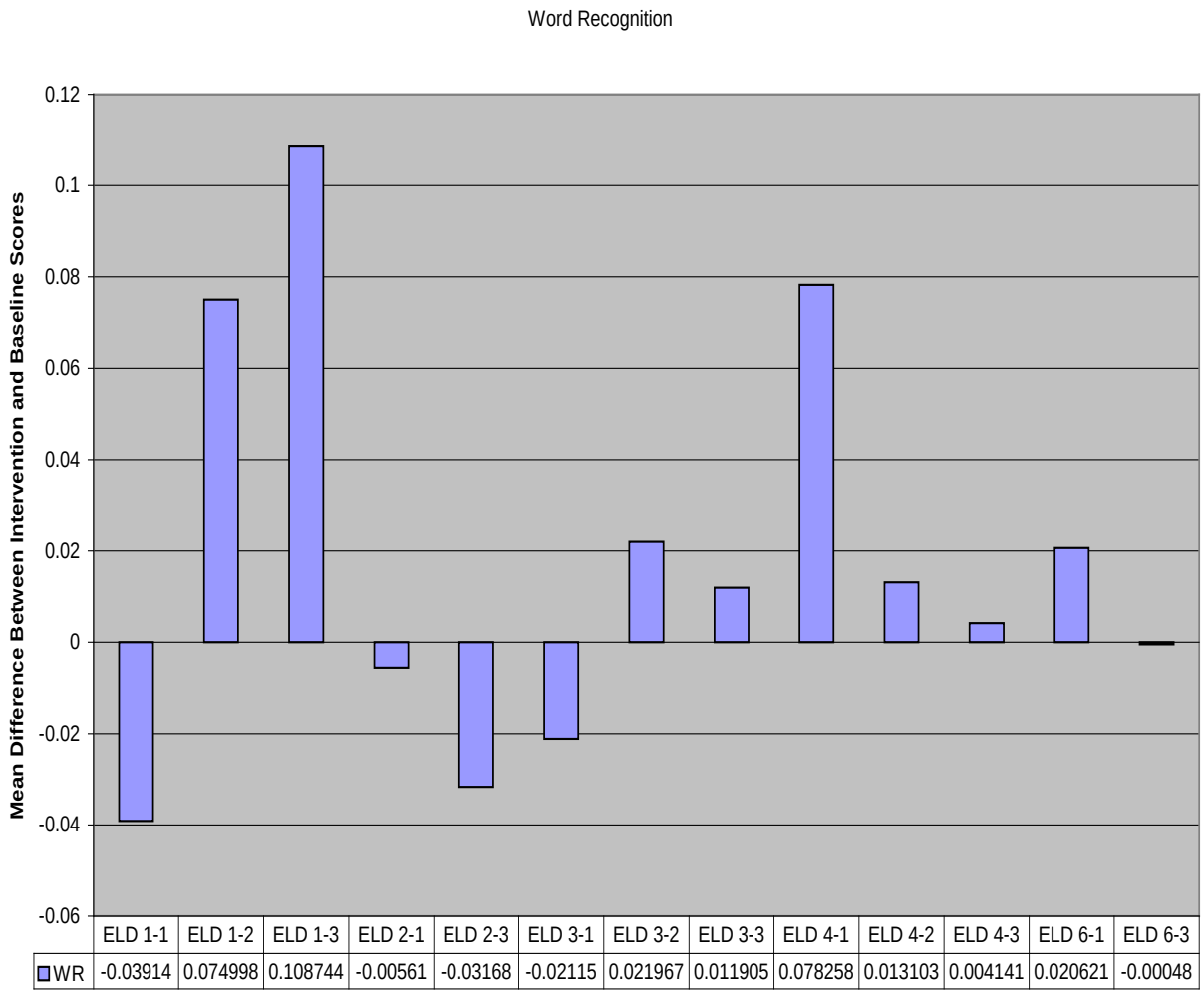
Table 7

The Number of Students in Each CELDT Group and Intervention Group.

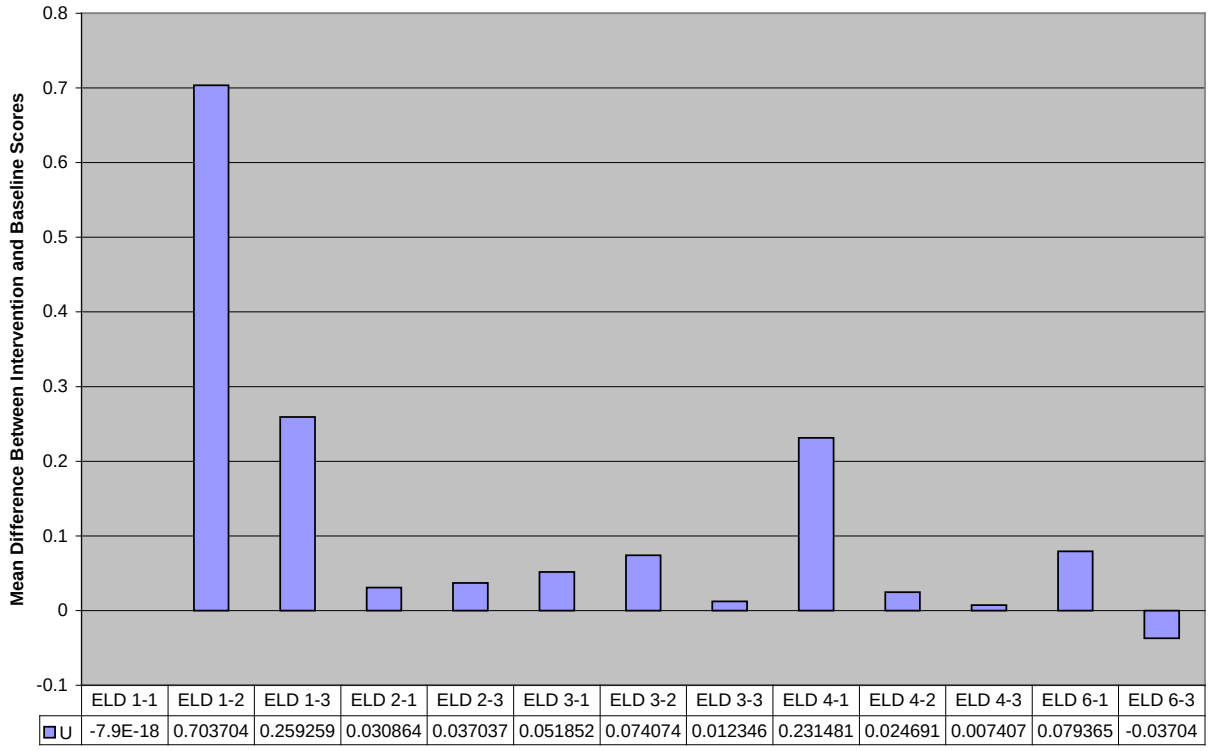
CELDT Level	Intervention Group	Number of Students
1	1	7
	2	1
	3	2
2	1	6
	2	0
	3	4
3	1	10
	2	5
	3	3
4	1	4
	2	2
	3	5
5	1	0
	2	0
	3	0
6	1	7
	2	0
	3	3

Figure 3

Three Graphs Comparing Average Growth in Word Recognition (WR), Word Understanding (U), and Complexity of Sentences (C) for Students of each CELDT (1-6) in each Group of Intervention.

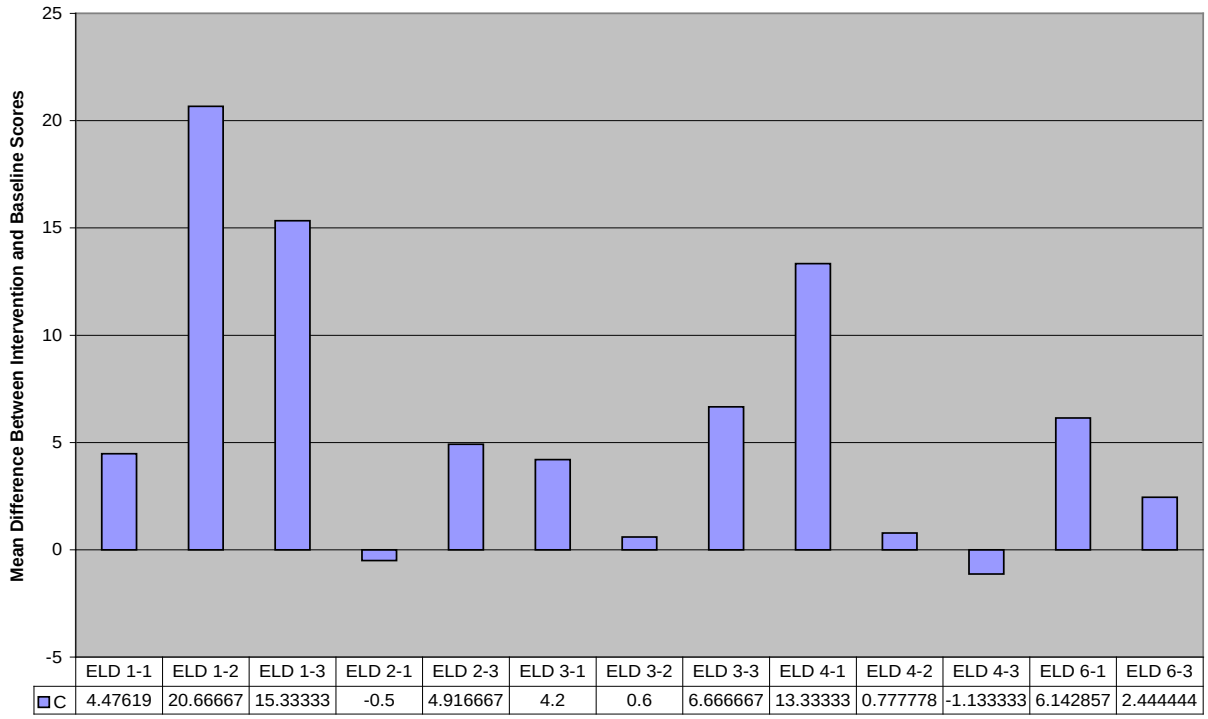


Usage



	ELD 1-1	ELD 1-2	ELD 1-3	ELD 2-1	ELD 2-3	ELD 3-1	ELD 3-2	ELD 3-3	ELD 4-1	ELD 4-2	ELD 4-3	ELD 6-1	ELD 6-3
U	-7.9E-18	0.703704	0.259259	0.030864	0.037037	0.051852	0.074074	0.012346	0.231481	0.024691	0.007407	0.079365	-0.03704

Complexity



	ELD 1-1	ELD 1-2	ELD 1-3	ELD 2-1	ELD 2-3	ELD 3-1	ELD 3-2	ELD 3-3	ELD 4-1	ELD 4-2	ELD 4-3	ELD 6-1	ELD 6-3
C	4.47619	20.66667	15.33333	-0.5	4.916667	4.2	0.6	6.666667	13.33333	0.777778	-1.133333	6.142857	2.444444

To discuss the question of multiple exposures *and* context affecting various CELDT levels differently, multiple exposures will be considered first. There is only sufficient data to compare differences between students in CELDT levels one, three, and four, since Table 6 indicates that there were no students in CELDT levels two, five and six. For each of these CELDT levels Table 7 calculates the mean difference between the improvements of students in Group 2 compared to the improvements of students in Group 1 for all three aspects of word learning tested in this study (WR, U, C). Students at CELDT level one and three improved in the areas of word pronunciation (WR), and usage (U) because of the intervention of multiple exposures. Students of CELDT level one were the only ones who also made gains in the area of complexity, but this data was not statistically significant. Students of CELDT four did not show any gains from multiple exposures, however none of their data was statistically significant either. To view the Chi Squares for each CELDT level that was not significant see Appendix G. Chi Squares were conducted for each aspect of word learning, and they reveal that CELDT 1 usage and CELDT 3 complexity were close to statistical significance. Chi squares were 4.286 for CELDT 1 usage, and 4.2 for CELDT 3 word recognition and were only statistically significant at the .2 level (according to the chart found at http://www2.lv.psu.edu/jxm57/irp/chisquar.html) which could not be used to rule out the differences occurring only by chance. On the website, an alpha level of .05 was used for all statistical tests. Table 8 includes both CELDT 1 usage and CELDT 3 complexity Chi Squares.

Table 8

Chi Squares for CELDT 1 average Comparison in Usage and CELDT 3 average Comparison in WR (pronunciation).

Table of Observed Frequencies: CELDT 1 U

Group	Progress	No progress	Total	Expected Progress	Expected No Progress
1-1	2	5	7	3.5	3.5
1-2	1	0	1	.5	.5
1-3	2	0	2	1	1
Total	5	5	10	5	5

Chi Square

Group	Observed	Expected	O-E	(O-E)2/E
1-1 progress	2	3.5	1.5	.643
1-2 progress	1	.5	.5	.5
1-3 progress	2	1	1	1
1-1 no progress	5	3.5	1.5	.643
1-2 no progress	0	.5	.5	.5
1-3 no progress	0	1	1	1

Chi square = 4.286
df = 2

Table of Observed Frequencies: CELDT 3 WR

Group	Progress	No progress	Total	Expected Progress	Expected No Progress
1-1	3	7	10	5	5
1-2	3	2	5	2.5	2.5
1-3	3	0	3	1.5	1.5
Total	9	9	18	9	9

Chi Square

Group	Observed	Expected	O-E	(O-E)2/E
1-1 progress	3	5	2	.8
1-2 progress	3	2.5	.5	.1
1-3 progress	3	1.5	1.5	1.5
1-1 no progress	7	5	2	.8
1-2 no progress	2	2.5	.5	.1
1-3 no progress	0	1.5	-1.5	1.5

Chi square = 4.8
df = 2

Considering that the areas of word recognition and usage were the areas of statistical significance, the aspect of multiple exposures will be discussed only in relation to word recognition and usage. Multiple exposures to words and their definitions helped students of CELDT level one and CELDT level three in the areas of word pronunciation (WR) and in using the word correctly in a sentence (U). Table 9 indicates that the average growth in word recognition (WR) for CELDT one students and CELDT three students

was 0.114142863, and 0.043119754 respectively. Students of CELDT level one benefited most from the multiple exposures intervention since the graphs in Figure 3 and numbers in Table 9 show greater gains for CELDT one students receiving multiple exposures intervention (Group 2) than for any other CELDT level receiving multiple exposures intervention. Students of CELDT level three made gains from the multiple exposures intervention, while students of CELDT level one (i.e. students who know the least amount of English) benefited most from the multiple exposures intervention.

Table 9

Comparison of Multiple Exposures Intervention (Group 2) with No Intervention (Group 1) for Various CELDT Levels.

CELDT Level	Word Recognition (Group 2 – Group 1)	Usage (Group 2 – Group 1)	Context (Group 2 – Group 1)
1	0.114142863	0.703703704	16.19047619
2	_____	_____	_____
3	0.043119754	0.022222222	-3.6
4	-0.06515431	-0.20679012	-12.5555555
5	_____	_____	_____
6	_____	_____	_____

*Note: Group 2 – Group 1 indicates the difference between the mean scores of students in intervention group 2 and the mean scores of students in intervention group 1.

To consider if the CELDT level affects the impact of context on word learning (meaning or pronunciation), and to discover if students of higher or lower CELDT level benefit more from hearing words in context, the data for the graphs in Figure 3 was used

to create Table 10 indicating the mean difference between baseline scores and intervention scores for each CELDT level. Again in this table, since some CELDT levels did not have students, there will be no information in that area of the corresponding table. Only the CELDT levels with data will be considered in the discussion. In Table 10, all three aspects of word learning (Word Recognition, Usage, Complexity) tested in the present study were compared. Under each of these main categories of word understanding, there are two scores for each CELDT level. The first score in Table 10 (G3-G2) compares the mean scores of all students of that CELDT level who were in Group 3 (students who received context intervention) with the mean scores of all students of that CELDT level who were in Group 2 (students who received only multiple exposures intervention). The second score in Table 10 (G3-G1) under each main category of word understanding (Word Recognition, Usage, Complexity) compares the mean scores of all students of that CELDT level who were in Group 3 (students who received context intervention) with the mean scores of all students of that CELDT level who were in Group 1 (students in the control group who received no intervention).

Table 10

Comparison of Context Intervention (Group 3) with Multiple Exposures Intervention (Group 2) and with No Intervention (Group 1) for Various CELDT Levels.

CELDT	Word Recognition (G 3-G2)	(G3-G1)	Usage (G3-G2)	(G3-G1)	Context (G3-G2)	(G3-G1)
1	0.0337	0.1478	-0.444	0.2592	-5.3333	10.8571
2	_____	-0.0260	_____	0.0061	_____	5.4166
3	-0.0100	0.0330	-0.0617	-0.0395	6.0666	2.4666
4	-0.0089	-0.0741	-0.0617	-0.2240	-1.9111	-14.4666
5	_____	_____	_____	_____	_____	_____
6	_____	-0.0211	_____	-0.1164	_____	-3.6984

*Note: G3-G2 is the difference of mean scores between students in intervention group three two (those with context intervention) and students in intervention group two (those with multiple exposures intervention). G3-G1 is the difference of mean scores between students in intervention group three (those with context intervention) and students in group one (those with no intervention).

By analyzing Table 10 according to CELDT level it became apparent that the intervention of context did not help English Only students make gains in any area of word understanding (not in WR, U, or C). The same is true of students of CELDT four. However, according to Table 5, the only area for English Only students that was statistically significant was in Usage, and according to Appendix G, none of the aspects of word learning were statistically significant for CELDT four students. Interestingly, when looking at Figure 4 it can be seen that students of CELDT three benefited most from multiple exposures rather than from context. The only time the context group of CELDT three students made greater gains than the multiple exposures group of CELDT

three students was in the area of complexity, and Appendix G reveals that for CELDT 3 students the area of complexity was not statistically significant. Every time the three intervention groups were compared for CELDT three students, there were greater improvements for those who had the interventions than for those who did not in the area of word reading (pronunciation).

For CELDT level 2 students, context did not cause gains in the area of pronunciation, but when comparing students who had the context intervention with students who did not have any intervention, students with context intervention made greater gains than those who did not have any intervention in both other areas of word understanding tested: usage and complexity (U, and C). However, none of the CELDT 2 scores were statistically significant. Appendix G includes the Chi Squares used to determine the statistical significance. Chi Squares for CELDT 2 students for word recognition, usage and complexity were .21, .74, and .361 respectively. According to the site http://www2.lv.psu.edu/jxm57/irp/chisquar.html, these Chi numbers are not statistically significant and fall between .07 and .05, which cannot rule out the possibility of results happening due to chance. Students of CELDT level 2 will not be discussed in the conclusions.

CELDT level 1 students who had context intervention saw greater gains in all areas of word understanding, when compared with those students of the same CELDT level 1 who did not receive any intervention (indicated by scores from the second box for CELDT 1 in Table 10). These differences were 0.1478, 0.2592, and 10.8571 respectively. Interestingly, all the scores of the CELDT level 1 students receiving context intervention showed less gains than those receiving only the multiple exposures intervention in the

area of word usage, or understanding the meaning of the word. This finding could have resulted since the initial English vocabulary for CELDT one students is so small that the context intervention was actually overwhelming for those students. Since the multiple exposures intervention provided the words, definitions, and model sentences, CELDT one students experienced multiple exposures, but to smaller amounts of learning than those in the context intervention. Table 8 indicates that the area of Usage is the only area of statistical significance.

Interestingly, when data was compared for students of CELDT level one in relation to all other groups of students (all other CELDT levels and English Only students) their results were statistically significant at the .025 level. The Chi Square showing the statistical significance is in Table 11.

Table 11

Chi Square for CELDT level one students compared to students of all other CELDT levels including English Only students (CELDT 6).

Table of Observed Frequencies: CELDT 1 vs. All: U

Group	Progress	No progress	Total	Expected Progress	Expected No Progress
CELDT 1-1	2	5	7	5.37	1.63
CELDT 1- 2	1	0	1	.77	.23
CELDT 1-3	2	0	2	1.53	.47
Group 1	23	4	27	20.7	6.3
Group 2	8	0	8	6.13	1.87
Group 3	10	5	15	11.5	3.5
Total	46	14	60	23	14

Chi Square

Group	Observed	Expected	O-E	(O-E)2/E
CELDT 1-1 progress	2	5.37	-3.37	2.11
CELDT 1-2 progress	1	.77	.23	.07
CELDT 1-3 progress	2	1.53	.47	.14
Group 1 progress	23	20.7	2.3	.26
Group 2 progress	8	6.13	1.87	.57
Group 3 progress	10	11.5	1.5	.2
CELDT 1-1 no progress	5	1.63	3.37	6.97
CELDT 1-2 no progress	0	.23	.23	.23
CELDT 1-2 no progress	0	.47	.47	.47
Group 1 no progress	4	6.3	2.3	.84
Group 2 no progress	0	1.87	1.87	1.87
Group 3 no progress	5	3.5	1.5	.64

Chi square = 14.37
df = 5

In the area of usage, students of CELDT level one who had multiple exposure or context interventions made greater gains than any other CELDT level group with or without interventions. Clearly, for CELDT level one students, multiple exposures and context interventions are significantly influential in helping them understand the meaning of vocabulary words and use those words correctly in sentences. Thus, students of lower

CELDT level (1 and 3) in this study benefited most from multiple exposures, yet also experienced great gains from context in the areas of word reading/pronunciation and usage/meaning. The impact of multiple exposures and context *does* vary with CELDT level. According to the data, students of lower CELDT (1, 2, and 3) benefit more from the interventions than students of higher CELDT (4 and 5). This could be because perhaps the higher CELDT levels are in need of more complex interventions, such as providing multiple contexts and definitions that are intended to build upon a basic understanding of the vocabulary.

Question 4

Will age affect the impact of multiple exposures and/or context on word learning?

To address question 4 students were sorted according to three different age ranges with age calculated in months (70-74, 75-79, and 80-85) and then divided into their group of intervention for the study. Group 1 were the students with no intervention, Group 2 were the students with multiple exposures intervention, and Group 3 were the students with context intervention. Table 12 shows how many students were in each age range and each intervention group:

Table 12

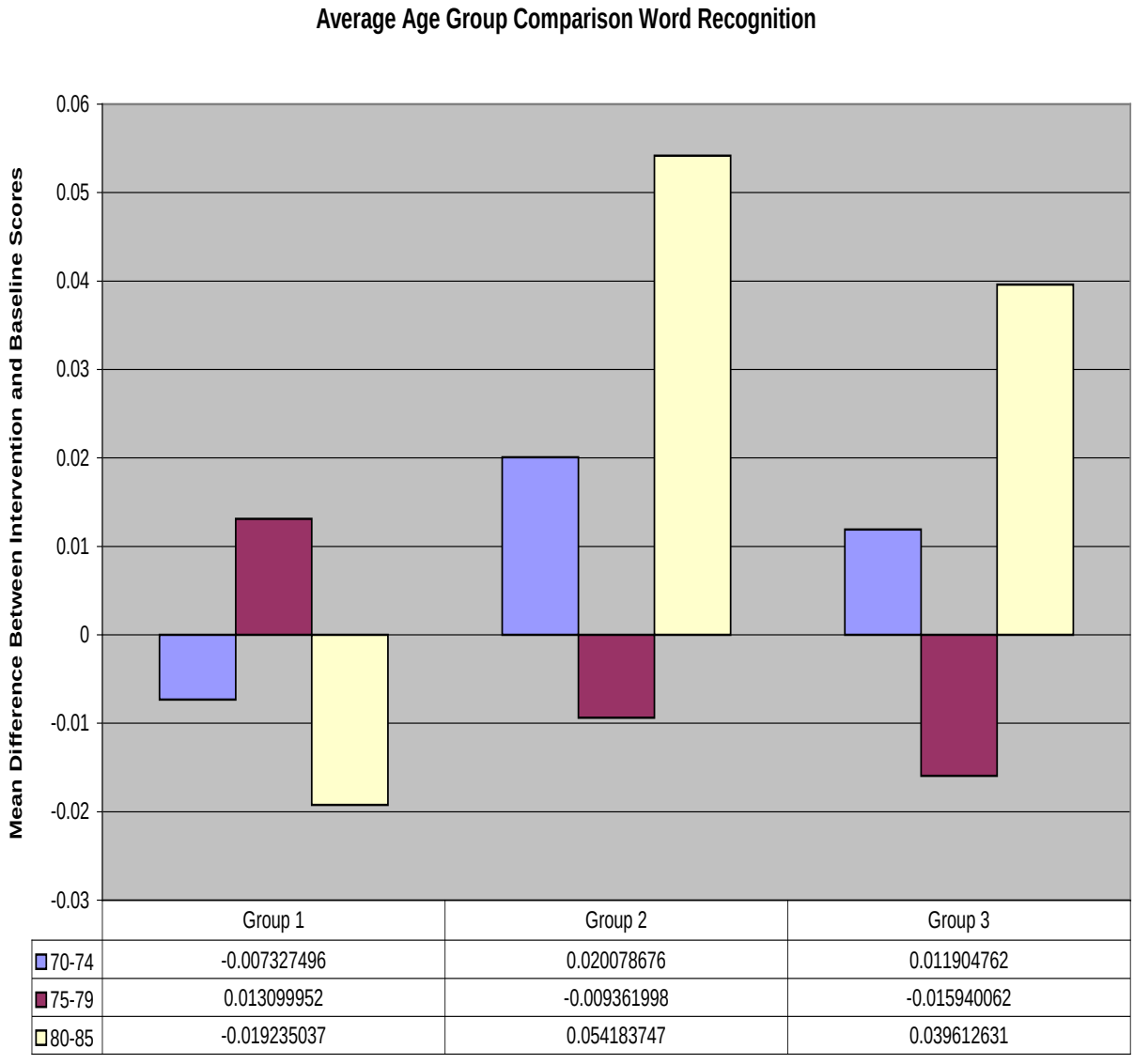
The Number of Students by Age Group in Each Group of Intervention.

Group	Age 70-74	Age 75-79	Age 80-85
1	9 students	15 students	10 students
2	4 students	2 students	3 students
3	1 student	9 students	7 students

This information was then graphed (see Figure 4) to discover any trends related to age groups and multiple exposures and context.

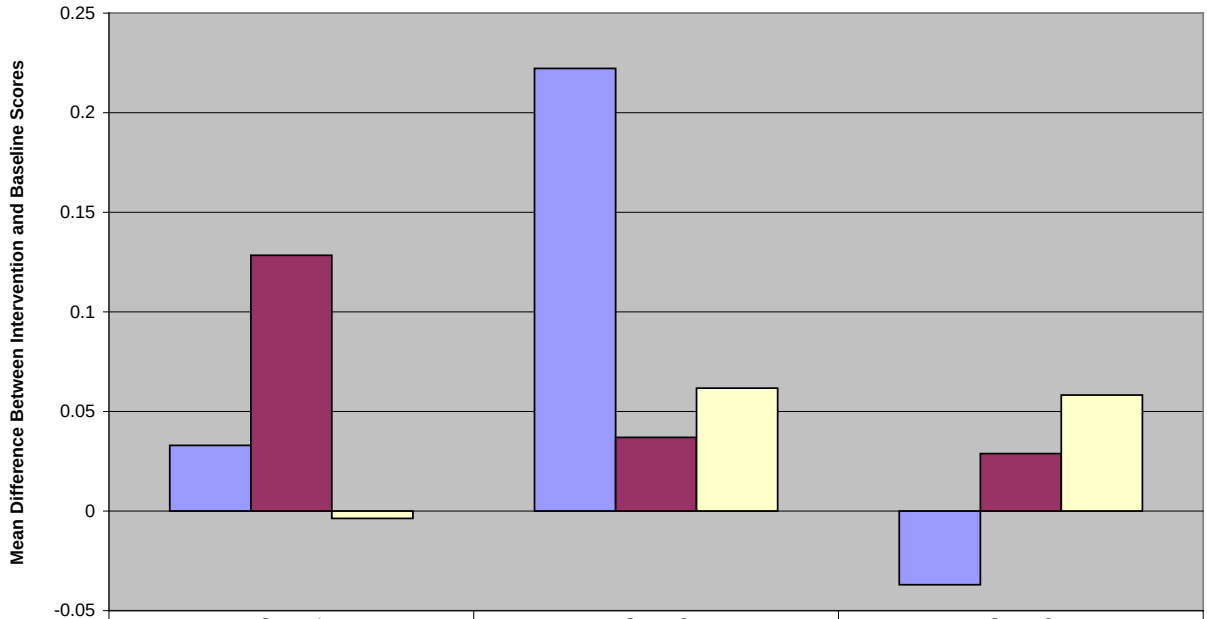
Figure 4

Three Graphs Comparing Average Growth in Word Recognition (WR), Word Understanding (U), and Complexity of Sentences (C) for Students of Each Age Group (70-74), (75-79), (80-85) in Each Group of Intervention (1, 2, and 3).



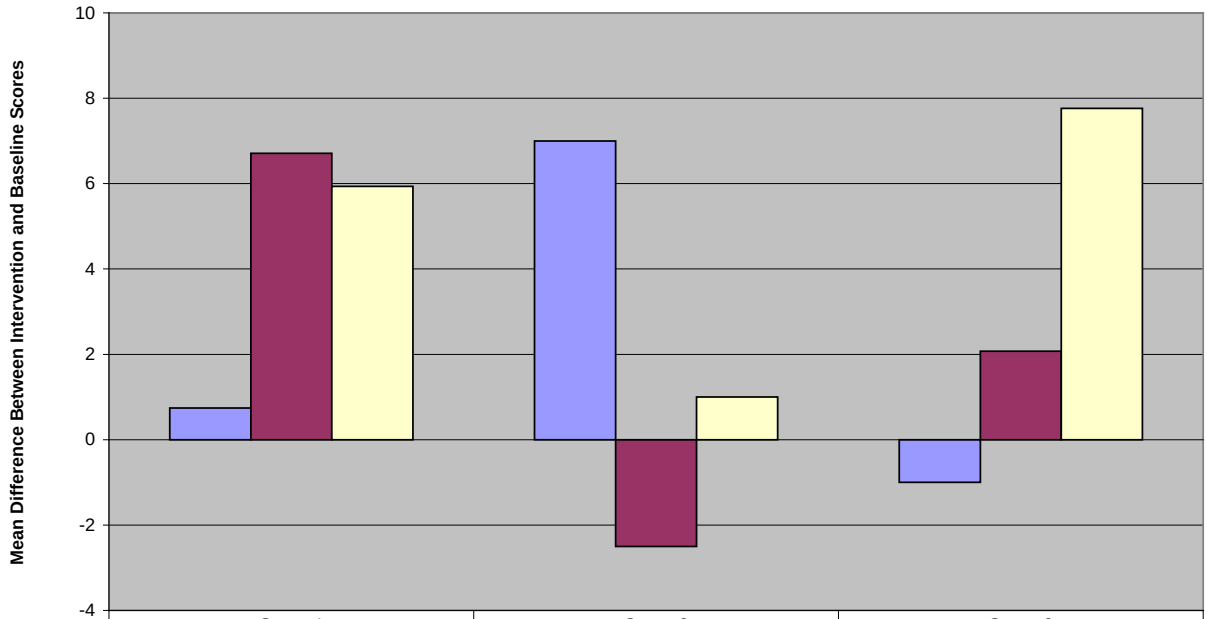
	Group 1	Group 2	Group 3
70-74	-0.007327496	0.020078676	0.011904762
75-79	0.013099952	-0.009361998	-0.015940062
80-85	-0.019235037	0.054183747	0.039612631

Average Age Group Comparison Usage



	Group 1	Group 2	Group 3
70-74	0.032921811	0.222222222	-0.037037037
75-79	0.128395062	0.037037037	0.028806584
80-85	-0.003703704	0.061728395	0.058201058

Average Age Group Comparison Complexity



	Group 1	Group 2	Group 3
70-74	0.740740741	7	-1
75-79	6.711111111	-2.5	2.074074074
80-85	5.933333333	1	7.761904762

When Chi Squares were conducted with the different age groups to determine statistical significance, only WR and U were statistically significant or close to statistical significance. Table 13 shows the Chi Squares for the areas of WR and U. Chi Square for WR was 12.496 and with a df of 8 needed to be at least 15.51 to be statistically significant at the .05 level according to the chart found at http://www2.lv.psu.edu/jxm57/irp/chisquar.html, but the Chi square was close between the .2 and .1 level. The Chi Square for U was 23.53 with a df of 8, which was very statistically significant at .001 level. The Chi Squares for C can be viewed in Appendix I.

Table 13

Chi Squares for Age in the areas of Word Recognition and Usage.

Table of Observed Frequencies: AGE: WR

Group	Progress	No progress	Total	Expected Progress	Expected No Progress
(70-74) 1	4	5	9	4.8	4.2
(70-74) 2	3	1	4	2.14	1.87
(70-74) 3	1	0	1	.53	.47
(75-79) 1	7	8	15	8	7
(75-79) 2	0	2	2	1.07	.93
(75-79) 3	8	1	9	4.8	4.2
(80-85) 1	3	7	10	5.33	4.67
(80-85) 2	2	1	3	1.6	1.4
(80-85) 3	4	3	7	3.73	3.27
Total	32	28	60	32	28.01

Chi Square

Group	Observed	Expected	O-E	(O-E)2/E
(70-74) 1 progress	4	4.8	.8	.133
(70-74) 2 progress	3	2.14	.86	.346
(70-74) 3 progress	1	.53	.47	.42

(75-79) 1 progress	7	8	1	.125
(75-79) 2 progress	0	1.07	1.07	1.07
(75-79) 3 progress	8	4.8	3.2	2.13
(80-85) 1 progress	3	5.33	-2.33	1.01
(80-85) 2 progress	2	1.6	.84	.252
(80-85) 3 progress	4	3.73	.27	.02
(70-74) 1 no progress	5	4.2	.8	.15
(70-74) 2 no progress	1	1.87	.87	.4
(70-74) 3 no progress	0	.47	-.47	.47
(75-79) 1 no progress	8	7	1	.03
(75-79) 2 no progress	2	.73	1.27	2.21
(75-79) 3 no progress	1	4.2	-3.2	2.44
(80-85) 1 no progress	7	4.67	2.33	1.16
(80-85) 2 no progress	1	1.4	.4	.11
(80-85) 3 no progress	3	3.27	.27	.02

Chi square = 12.496
df = 8

Table of Observed Frequencies: AGE: U

Group	Progress	No progress	Total	Expected Progress	Expected No Progress
(70-74) 1	7	2	9	6.93	2.06
(70-74) 2	4	0	4	3.08	.92
(70-74) 3	0	1	1	.77	.23
(75-79) 1	14	1	15	11.56	3.44
(75-79) 2	2	0	2	1.54	.46

(75-79) 3	8	1	9	6.93	2.07
(80-85) 1	3	7	10	7.7	2.3
(80-85) 2	4	0	4	3.1	.92
(80-85) 3	5	2	7	5.4	1.6
Total	47	14	61	47	14

Chi Square

Group	Observed	Expected	O-E	(O-E)2/E
(70-74) 1 progress	7	6.93	.07	.00007
(70-74) 2 progress	4	3.08	.92	.27
(70-74) 3 progress	0	.77	-.77	.77
(75-79) 1 progress	14	11.56	2.44	.52
(75-79) 2 progress	2	1.54	.46	.14
(75-79) 3 progress	8	6.93	1.07	.17
(80-85) 1 progress	3	7.7	-4.7	2.9
(80-85) 2 progress	4	3.1	.9	.3
(80-85) 3 progress	5	5.4	.4	.03
(70-74) 1 no progress	2	2.06	.06	.002
(70-74) 2 no progress	0	.92	-.92	.92
(70-74) 3 no progress	1	.23	.77	3.68
(75-79) 1 no progress	1	3.44	-2.44	1.7
(75-79) 2 no progress	0	.46	-.46	.46
(75-79) 3 no progress	1	2.07	-1.07	.55
(80-85) 1 no progress	7	2.3	4.7	9.6
(80-85) 2 no progress	0	.92	-.92	.92
(80-85) 3 no progress	2	1.6	.4	.6

Chi square = 23.53
df = 8

Several observations can be made when looking at the graphs of age (see Figure 4). First, younger students benefited more from multiple exposures. The first bar among each grouping of three bars is the youngest age group of students (70-74 months). These bars are highest in the middle (Group 2) where students only received multiple exposures to the vocabulary words and their definitions. This observation holds true for all aspects of word understanding tested (WR and U). The area of complexity (C) is not considered since Appendix H shows that complexity was not statistically significant. Thus, younger students benefited most from multiple exposures to words, definitions and model sentences. Next, the middle age group of students (75-79 months) did not benefit from any of the interventions. The second bar in the grouping of three bars is the middle age group. Last, older students (80-85 months), represented by the last bar in each grouping of three bars, benefited from the multiple exposures and context interventions. Older students in Group 2 (those who received multiple exposures intervention) made greater gains than students in Group 1 who did not receive any intervention in the areas of pronunciation (WR) and usage (U), so multiple exposures helped older students pronounce words better and impacted their ability to use the words in sentences. Older students who received context intervention (Group 3) made greater gains than students who did not receive any intervention in every area of word understanding assessed (WR and U). Thus, context positively impacts older students.

Chapter 5

Question one asks if multiple exposures and/or context positively impact student pronunciation and/or understanding of word meaning. From the findings of this study it can be noted that multiple exposures improved student's pronunciation of words and improved their understanding of the meaning of the word, but multiple exposures did not improve the complexity of their sentences. This could be because the intent of the sentences included on the multiple exposures intervention tape or CD was meant to improve understanding of word meaning rather than provide students with more complex sentences, it may have also happened by chance since the complexity results were not statistically significant.

In considering context, the only area where context improved student achievement with words was in the complexity of student's sentences. Students who received context intervention improved less than students who received multiple exposures intervention in the areas of word recognition and understanding, indicating that multiple exposures to words and definitions were more valuable than context for word pronunciation and usage. The difference in complexity could be since the stories provided more complex sentences for students to hear, while the sentences provided for the multiple exposures intervention were simple rather than intricate because the intent was to help students with understanding of word meaning rather than to build more complex understanding. Again, the results regarding complexity could be due to chance since the complexity scores were not statistically significant.

Two studies were not supported by the findings in this study related to the general impact of multiple exposures and context on word pronunciation and meaning for

students. In one study it was noted that the context group "demonstrated significantly better expressive vocabulary knowledge" than those who did not receive the context instruction (Nash, H., & Snowling, M., 2006 p. 349). In the present study this was not the case. Though context intervention supported greater gains in the complexity of student's sentences, it did not produce significant gains in understanding of word meaning. The other study not supported by this research is one by Biemiller and Boote where they stated that instruction of word meanings in context is more effective than no-context instruction of word meanings (2006, p. 2). Even when the context group was compared to the group of students who did not receive any intervention, the context group did not show greater gains in word meanings. Since the context intervention used the same story taught in class, a beneficial further study would be to research if using a different story for context intervention would improve student understanding of word meanings.

Though two studies were not supported by the current research, one idea mentioned by Bitchner (2004) was supported. In his research Bitchner mentioned the "Context Availability Hypothesis" that claims that contextual information associated with contexts in which vocabulary has been encountered is more accessible for concrete vocabulary than abstract vocabulary (p. 90-91). This pertains well to this study because, part of the struggle the English Language Learners face in learning the new vocabulary for the intervention assessments is that many of the words are abstract and cannot be represented with a picture. It could be that the context intervention was not as effective because most of the words were abstract.

Question two considers if multiple exposures and/or context positively affect word pronunciation and/or understanding of word meaning for English Language

Learners. It then asks if that impact is the same for English Only students. This study reveals that the positive impact that multiple exposures and context provide for English Language Learners is not the same for English Only students. Multiple exposures and context positively affect word pronunciation and understanding for English Language Learners, while English Only students did not benefit from any context intervention. This could be because English Only students may have needed more complex and/or increased time interventions to demonstrate significant gains.

English Language Learners in this study benefited most from multiple exposures to vocabulary words rather than from context intervention. This may be because the context is not as accessible for English Language Learner's more limited understanding of English. However, English Language Learners with the interventions (either multiple exposures or context) showed greater growth than the English Only students in all areas of word understanding assessed in this study, while English Language Learners who did not receive any intervention showed less growth than any of their English Only peers (those with or without the intervention). Thus, had the English Language Learners not received the intervention, they would not have made more gains than their English Only peers. They would still be at a disadvantage in vocabulary learning. Teachers of English Language Learners should use this study to remind them of the importance of including multiple exposures and context instruction when teaching vocabulary to English Language Learners.

The many studies that mentioned "Matthew Effects" expressed concern for the gap in vocabulary experienced by less proficient readers (Baumann, J. F., & Kame'enui, E.J. (Eds.), 2004; Beck, I. L. McKeown, M. G., & Kucan, L.,2002; Ehri, L. C., &

Rosenthal, J., 200;, Ehri, L. C., & Rosenthal, J., 2007; Kleeck, A. V., Stahl, S. A., & Bauer, E. B. (Eds.)., 2003; Newton, E, Padak, N. D., & Rasinski, T. V. (Eds.)., 2008; O'Connor, R. E., 2007; Justice, L. M., Meier, J., & Walpole, S., 2005; Penno, J. F., Wilkinson, I. A. G., & Moore, D. W., 2002; Swanborn, M. S. L., & Glopper, K., 2002; Swanborn, M. S. L., & Glopper, K., 1999). In the current study, students of CELDT level one (those with the least amount of vocabulary knowledge) made the greatest gains in word pronunciation and meaning from the interventions. Table 11 shows the statistical significance of the scores, and Figure 3 shows how much more improvement CELDT level one students made with the help of the interventions. Their average improvement scores were greater than all other students involved in the study. The interventions of multiple exposures and context in this study helped bridge the deficit gap that English Language Learners face in vocabulary. Not only did the interventions bridge the gap between English Language Learners limited English vocabulary knowledge and the vocabulary knowledge of their English Only peers, but also with the interventions the English Language Learners made even greater gains than their English Only peers (both those who received context intervention and those who did not) in vocabulary pronunciation and meaning. Thus, the present study establishes that the vocabulary gap can be bridged with CELDT one English Language Learners. It also shows that for the CELDT one students in this particular study, quick differences can be made in vocabulary acquisition with multiple exposures and context intervention. Therefore, early intervention strategies, such as those supported by this study, can help bridge the literacy gaps described in the Matthew Effects Model.

The findings of this study in relation to English Language Learners and English Only students supported two studies. In one study by Swanborn and Glopper (2002), it was noted that low-ability readers hardly learned any words incidentally. This conclusion was supported by the observation in the current study that the English Language Learners who did not receive any interventions showed fewer gains in word pronunciation and meaning than all their peers. Thus, they did not learn the pronunciation or meaning of the vocabulary words incidentally. Additionally, the English Language Learners in the study did not even learn the pronunciation and meaning of the vocabulary words with the research-based effective direct instruction in the classroom. In contrast, all the English Language Learners who received intervention (either multiple exposures or context) made greater gains than English Only students or English Language Learners with no intervention in all areas of word understanding tested in this study: pronunciation, usage, and complexity. The findings reveal that English Language Learners need more exposures to vocabulary words than they receive in class if they are going to overcome the vocabulary deficit they face when they enter school.

Zahar, Cobb, and Spada (2002), concluded that frequency of exposures to vocabulary words appears to be three to four times more important for beginning readers than for advanced students. This conclusion that multiple exposures are more important for beginning readers held true for the current study. English Language Learners in group two who received multiple exposures to vocabulary words, their definitions, and simple model sentences showed greater gains in word pronunciation and meaning than all the other English Language Learners *and* the English Only students in this study. This finding implores teachers of English Language Learners to include specific instruction in

key vocabulary, provide multiple exposures to those words, and include enough focused exposures to context to provide a frame of reference for students. When teachers provide these extra interventions, English Language Learners can not only catch up but also perhaps even surpass their English-speaking peers who do not face a disadvantage in vocabulary knowledge.

Question three deals with the concept of multiple exposures and context in relation to the different CELDT levels. In considering multiple exposures, there were only enough students in each group to discuss findings for CELDT levels one, three, and four. It can be concluded that multiple exposures to words and their definitions did not help students of CELDT level four, but helped students of CELDT level one and three in the areas of word pronunciation and in using the word correctly in a sentence. These areas of word understanding are the only ones considered since the complexity results were not statistically significant (See Appendix G). Students of CELDT level one (i.e. students who know the *least* amount of English) benefited most from the multiple exposures and context interventions. This may be since CELDT 1 students are more dependent on multiple exposures and context and would not be able to give a sentence for new vocabulary words unless provided with an example that they hear often, since they don't yet have the broad vocabulary knowledge available to create their own complete sentences. The findings in the current study reveal that struggling English Language Learners who know the least amount of English can overcome their disadvantage in vocabulary knowledge if provided multiple exposures to the specific vocabulary they need to learn.

The finding that CELDT one English Language Learners made greater gains in word understanding from multiple exposures to words rather than from context supports several studies (O'Connor, 2007; Zahar, Cobb, and Speda, 2001; Justice, Meier, and Walpole, 2005). O'Connor (2007) states that struggling readers need more frequent small doses of instruction so that they learn words well enough that they can read them effortlessly. Lower CELDT one students in the multiple exposures group received frequent small doses of instruction, which included the pronunciation of each word, the definition of each word, and a model sentence with each word. In this study the small doses aspect of O'Connor's finding could be the key, since the lower CELDT one students who received the context intervention actually had more exposures to the vocabulary words, however they did not make more gains in word understanding. This could be since the context provided too much information for students with such a depressed English vocabulary. In agreement with the finding that those lower CELDT one students who received multiple exposures intervention made even greater gains than their peers with or without intervention in every area of word understanding tested is a finding from Zahar, Cobb, and Speda (2001). In their conclusions, Zahar, Cobb, and Speda noted that frequency appears to be three to four times more important for beginners than for advanced students. Likewise, the beginning students in the current study benefited more from the interventions than the advanced students. Justice, Meier, and Walpole (2005), also discovered in their findings that "children with depressed skills made greatest gains with elaborated word meanings," where elaborated word meanings indicates that the "adult reader provided the meaning of the word followed by an example of its use in a sentence" (p. 29). In the current study the multiple exposures intervention

was just as Justice, Meier, and Warpole (2005) described their elaborated word meanings (e.g. providing the meaning of the word and an example of its use in a sentence). The findings of Justice, Meier, and Warpole were the same as in the current study: those with less vocabulary made the greatest gains from multiple exposures to words, their definitions, and model sentences with the words.

The present study reveals that the intervention of context did not help English Only students make gains in any area of word understanding: pronunciation, use in a sentence, or the complexity of the sentence they stated. The same was true for students of CELDT four. However, these findings were not statistically significant. Of statistical significance, however, was that CELDT one students who had context intervention saw greater gains in all areas of word understanding, when compared with those students of the same CELDT one level who did not receive any intervention.

Students of lower CELDT in this study benefited most from multiple exposures, yet also experienced gains from context. The impact of multiple exposures and context *does* vary with CELDT level. According to the data, students of lower CELDT benefit more from the interventions than students of higher CELDT. Not only did the interventions help the CELDT one students, but also they surpassed all other students in every area of word understanding tested in this study. Teachers of English Language Learners would be amazed that such simple attention to providing multiple exposures to words, including their definitions, model sentences, and context could bring those who know the least English vocabulary to the top of the class in vocabulary knowledge: reading, pronunciation, and meaning.

The multiple exposures intervention yielded the greatest gains for English Language Learners in this study, and helped lower English Language Learners (CELDT 1) surpass everyone else in growth in word learning. The only other group of students who made greater gains than the CELDT 1 English Language Learners with multiple exposures intervention was the CELDT 1 group of students who received context intervention, and the only area where these students made greater gains was in word recognition (i.e. reading words). This finding suggests that through the context intervention students were exposed to the printed words multiple times, enabling them to better recognize the word when reading it, and because they heard the word read multiple times on the audio tape, they were able to pronounce the words correctly as well. Surprisingly the context intervention did not help students understand word meaning. This could be because the context intervention used the stories from the curriculum to provide the context. So rather than adding to the depth of understanding of the words, the context intervention was meant to reinforce the context presented in class.

Thus, a further study in relation to context would be to research the effects of context intervention on English Language Learners in comparison with English Only students and then compare if multiple exposures to the *same* context benefit any one group more than the other and in what aspects of word learning the benefits come, or if providing greater depth of word understanding through *multiple* contexts brings more benefit to either group. In the current study, only lower CELDT students benefited from the context intervention. They improved in word reading and pronunciation but not complexity, which would indicate that the context itself was not the benefit; rather it was

the multiple focused exposures to the printed words and their pronunciation that the context intervention gave students that caused improvement.

It would be helpful to know if providing *various* contexts (e.g. several different stories that include the vocabulary in different ways) improves understanding of word meaning and the complexity of students understanding of the vocabulary, as well as pronunciation and word reading because if varied context brings growth in all aspects of word learning, then teachers should use varied contexts for intervention rather than the same context as was done in the current study. However, if students only improve in understanding word meaning and the complexity of students' understanding of the vocabulary, than teachers would need to determine what aspect of word learning their students need and use that type of context intervention. Beck and McKeown (2007) also noted that children in their study became bored with three times reading the same context with no additional contexts. This was the case for students in the current study, and that is why the context intervention students only showed greater improvements in word reading and pronunciation, not in word meaning or complexity. However, Baumann (2004), in his book *Vocabulary Instruction* brings the opposite idea to the forefront when he discussed that "reading a book several times leads to more word learning than reading several different books once each" (p. 32). The focus of the current study was not on whether multiple exposures to the same context or to various contexts caused greater vocabulary growth, but this would be a beneficial aspect of vocabulary intervention to be researched in the future.

The finding that lower English Language Learners benefited most from multiple exposures supports much of the current research on vocabulary instruction. In the study

by Beck and McKeown, (2007) the students who received multiple exposures to the target words over a span of several days performed better on the assessment given. According to Jerome Shostak (2001), students need repeated encounters with new words if vocabulary instruction is to have a measurable impact on reading. A word needs to be encountered eight times for incidental word learning to occur and the probability of incidentally learning new vocabulary decreases for those who can't read (Carlo, M. S., August, D., McLaughlin, B., Snow, C. E., Dressler, C., Lippman, D. N., et al., 2004). Not only that, but one study by Francis, et. al. (2006, p. 8) found that the number of necessary exposures increases for students learning a second language. "ELLs-and their classmates need between 12-14 exposures to a word and it's meaning" to gain a deep understanding of the word. This finding was certainly the case in the present study. Each student in the multiple exposures intervention was exposed to the vocabulary words five extra times to the times they were exposed to the words in class. Thus, those English Language Learners who surpassed their English Only peers in word understanding were exposed to the vocabulary words at least ten times each week.

In summary, students in the current study benefited from seeing printed words multiple times along with hearing the words, which supports Rosenthal's (2008) conclusions. He states that teachers should include written words as part of vocabulary instruction, and students should pronounce spellings so that students can unitize the words and not have to concentrate on the task of decoding. Rosenthal's (2008) Dual Coding Theory suggests that individuals learn words through two primary means: visual and auditory and that both of these learning modalities work together to contribute to word knowledge. With Rosenthal's (2008) Dual Coding Theory *and* with students in the

current study, children were able to use the spellings to trigger their understanding of the pronunciations. Interestingly, the aspect of word learning that Dual Coding Theory suggests would improve with the visual and auditory support is the pronunciation and reading of the word and the area where students improved greatest from seeing the words more and having their attention drawn to the target words in this study was in word pronunciation and reading.

The finding that students in the study were able to use the written words to trigger their memory of the word's pronunciation and meaning suggests another important further study. Researchers should examine if having students repeat the words as they were read on the tape would improve their word learning any more. If visual and auditory interventions help students remember the pronunciation and meanings of words, could the addition of students repeating the words, definitions, and model sentences provide even greater reinforcement for further growth in word learning? In the current study the intervention just involved students following along while hearing the words, definitions, model sentences, and story, but would the intervention have made an even greater impact on more groups of students if the students had been asked to repeat the words and sentences. Ehri and Rosenthal (2008) noted in their study that spelling became bonded to pronunciations, so if students were pronouncing the words more while seeing their spellings, their word reading would increase. Jaen (2005/2006) also agreed that teachers should pronounce words before writing them or presenting them to be read because pronunciation and spelling are so connected. Additionally, Graves (2006) stated that listening *and* speaking are particularly important for vocabulary growth. O'Connor even notes that oral language, reading words, and reading comprehension are intimately

intertwined, suggesting that the repeating of words has the potential to impact students in major aspects of reading. Roberts and Neal further support the need for this additional research when they explain that linguistic comprehension is the ability to take word meaning and derive a sentence which is an *oral language competence* used in reading comprehension. If this finding is true, then students in the current study should have made even greater gains had they orally repeated the words, definitions, and sentences. It could thus be beneficial for research to indicate whether students repeating vocabulary words, their definitions, and model sentences while seeing them would positively impact their word reading in even greater ways than simply being exposed to the information multiple times.

Some studies (Ehri, 2005; O'Connor, 2007) also concluded that when students hear the words, see the words, and identify the meaning of the word through context, they could learn the word and meaning in one step. Taking the support of printed words and combining it with comprehension support to enhance understanding of both the word pronunciation *and its meaning* was not supported in this study, since students who received context intervention did not make greater gains in word meaning than those who only received multiple exposures to words. However, as previously mentioned, this could be since the context intervention did not provide another context, but rather reinforced the context already presented in class. Thus, it is likely that students did not gain word understanding from the context because the context did not provide any further understanding of the vocabulary. It could also hold true that the multiple exposures intervention which built upon the foundation of context in class could have provided enough context to assist students in learning the meaning as well.

More recent studies (Atay, D., & Kurt, G., 2006; Penno, J. F., Wilkinson, I. A. G., & Moore, D. W., 2002; Stanovich, K. E., 2009, Spring Term) of vocabulary in relation to context are supported by the findings of the current study. Penno, Wilkinson, and Moore (2002) concluded in their study that students who knew the fewest words made the greatest vocabulary gains from context. Stanovich (2009) also noted that based on his research in the 1970's he expected that skilled readers would benefit more from context intervention since he favored Frank Smith's theory that "skilled readers are more reliant on contextual information than on graphic information" (p. 1). To Stanovich's surprise, all his "research results pointed in the opposite direction: it was the poorer readers, not the more skilled readers, who were more reliant on context to facilitate word recognition" (p.1). This brings up a limitation for the current study: Stanovich's observations were based on reading ability, while the conclusions of lower students benefiting more from context in the present study relate to poor vocabulary knowledge. Though much research agrees with a study by Atay and Kurt (2006) where they noted that limited vocabulary was an important predictor in the underachievement of children in reading ability, it would be useful to conduct the same research as the present study but specifically assess reading ability to further make accurate judgment regarding the specific benefits of context on word learning both in relation to context and the popular theory of "Matthew Effects."

Question four asks if age will affect the impact of multiple exposures and/or context on word learning. The findings of this study reveal that multiple exposures to words, their definitions, and model sentences helped older students pronounce words better and impacts their ability to use the words properly in sentences. Older students

who received context intervention made greater gains in every area of word understanding assessed than students who did not receive any intervention. Thus, context intervention positively impacts older students. Teachers should then consider providing older students with more context-based instruction for vocabulary learning. It could prove beneficial to include multiple stories with important vocabulary words to help older students improve in their understanding of the meaning of the word and the pronunciation/reading of the word as well. For students of other age groups there were no significant differences between gains in word understanding with the interventions of multiple exposures and/or context.

The analysis of various age groups in relation to vocabulary yielded results that agreed with one study researched which focused on age and distinctions in vocabulary acquisition. Bus in the book *On Reading Words to Children* noted, "older children with larger vocabularies can learn words from fewer exposures" (p. 19). The older group of students in this study made the most gains from context, and thus support the notion that Bus made that older students can learn vocabulary from fewer exposures. Perhaps younger students did not experience gains in their vocabulary understanding because they still needed more exposures to the vocabulary words.

Contrary to what was expected in the hypotheses, the context intervention was not significantly beneficial for students in this study when compared with students who received multiple exposures intervention. The original hypothesis was that students need to encounter the new vocabulary words more often so that those words can become "high frequency" words that students hear often and use in daily conversation, but after further consideration of the situation at the site, and based on analyzing the assessments that

students struggle with, the addition of context came about. The hypothesis was that the amplified auditory, visual, *and* contextual support should increase student performance on the assessment in both areas of word pronunciation and word meaning. It was also predicted that students who know less English (lower CELDT), would benefit more from any amount of auditory, visual, or contextual support, since they are hearing English words less frequently in general. All aspects of the hypothesis were supported by this study except the prediction that the context intervention would help all students learn *both* the pronunciation and meaning of target vocabulary words. It can be concluded that students who received contextual support showed more growth in the pronunciation of words.

The present study, however, brought a new aspect of vocabulary research to the forefront. There are many studies showing the benefits of context instruction for students, especially those facing vocabulary deficits, and there are many studies displaying the benefits of multiple exposures to vocabulary words for those with depressed vocabulary, but until this study, there was no research comparing both strategies to discover whether multiple exposures or context provide more benefit. This comparison should be studied more in the future, because all teachers know that time in and out of the classroom is precious, and the ability to make research-based decisions about the type of interventions that would be most beneficial for the specific needs of students at their site would be monumental.

Limitations and Recommendations

Several potential weaknesses can be seen in the current study. First, the sampling was narrowed to only students at one elementary school in grade one, and so this study

does not generalize to the larger population. Next, one aspect of the study focused on differences in CELDT level, yet there were not enough students in each CELDT group to analyze the effects of multiple exposures and context intervention on all CELDT levels. Then, the decision to analyze the effects of multiple exposures and context interventions on first grade students included developing a baseline of data to compare with intervention data that would then indicate growth or lack of growth. The limitation here is that the graphic comparisons are based upon growth, yet the reason the topic was studied in the first place was because students in the past struggled at that point in the year and not only failed to show growth in vocabulary knowledge, but also they *declined* in their word learning. Thus, any growth between the baseline scores and the intervention scores shows a change from years past, yet the growth does not indicate whether these students would have learned the words to the same degree if they had not received the interventions.

One limitation for the study was already mentioned in chapter five, that several researchers observations were based on reading ability, while the conclusions of lower students benefiting more from context in the present study relate to poor vocabulary knowledge. Though many studies revealed that vocabulary knowledge is a significant predictor of reading ability, it would be useful to conduct the same study but assess reading ability prior to interventions to further make accurate judgment regarding the specific benefits of context on word learning in relation to vocabulary knowledge and reading ability.

Another limitation to the study was that there were so many aspects of word learning to compare for question three dealing with the specific affects of multiple

exposures and context interventions for various CELDT levels, yet there were so few students in each CELDT group to make significant distinctions and conclusions about the specific impacts of multiple exposures and context intervention on word learning. Since there were no students in some CELDT levels and groups (CELDT 2 group 2, CELDT 5, all groups, and CELDT 6 group 2) at the site involved in the current study those CELDT levels were not considered in the results. It would be beneficial to conduct the same study with more students so that each CELDT level could be addressed, and so that there would be enough students in each group to discover p values and conduct statistical analysis of the data to generalize the results to other populations.

A further study in relation to context would be to research the effects of context intervention on English Language Learners in comparison with English Only students while comparing if multiple exposures to the *same* context benefit any one group more than the other and in what aspects of word learning the benefits come, or if providing greater depth of word understanding through *multiple* contexts brings more benefit to either group. In the current study, only lower CELDT students benefited from the context intervention, and they only improved in word reading and pronunciation, which would indicate that the context itself was not the benefit, but rather it was the multiple focused exposures to the printed words and their pronunciation that the context intervention gave students that caused improvement.

Additionally in relation to context, a limitation of the present study was that students were not assessed on the same vocabulary several months later. Nash and Snowling (2005) in their study concluded that when students who only received definitional explanation of words and students who received context instruction of words

were tested immediately after teaching both groups showed the same growth in words knowledge, but "3 months later the context group demonstrated significantly better expressive vocabulary knowledge" (p. 349). Baumann agrees with the long-term impact of context instruction when he mentions that "when learned in context, words appear to be retained well" (p. 32). The impact of context and multiple exposures intervention should be examined for long-term effects.

In the current study students were not asked to repeat the vocabulary words, definitions, or sentences, but several studies revealed that this could be an advantageous addition to the interventions. It should be examined if having students repeat the words as they were read on the tape would improve their word learning any more. In the current study the intervention just involved students following along while hearing the words, definitions, model sentences, and story. However, would the intervention have made an even greater impact on more groups of students if the students had been asked to repeat the words and sentences? It would be beneficial for research to indicate whether students repeating vocabulary words, their definitions, and model sentences while seeing them would positively impact their word reading. This research would be beneficial to the field of vocabulary since Graves (2006) stated that listening *and* speaking are particularly important for vocabulary growth. Then O'Connor even notes that oral language, reading words, and reading comprehension are intimately intertwined, suggesting that the repeating of words has the potential to impact students in major aspects of reading. If Graves and O'Connor's findings are true, then the deficit in vocabulary that English Language Learners face could be lessened further and faster.

Robert's study (2008) brought another further study idea to mind. Roberts researched storybook reading comparing preschool students who read the stories at home in their primary language versus students who read the stories at home in English. She discovered that "children who received books in their primary language for home reading identified significantly more of the storybook words in English than did children who received English-language storybooks for home reading" (p. 113). She also noted that there was no disadvantage when children switched from one language to the other. After analyzing Robert's study it became apparent that there would be great benefit to English Language Learners for researchers to study if multiple exposures and context interventions as provided in the current study would be more or less effective if sent home in the student's primary language.

Conclusions

Multiple exposures intervention improved student's pronunciation of words and improved their understanding of the meaning of the word. Thus this pilot study can serve as a foundation of research supporting the need for teachers of students facing vocabulary deficits to provide parents with carefully planned multiple exposures intervention aligned with vocabulary teaching in class to improve students' understanding of the pronunciation and meaning of vocabulary words. These results also indicate that teachers cannot neglect providing English Language Learners with as many encounters with vocabulary words, definitions, model sentences, and context so that they can not only bridge the vocabulary deficit they face when entering school, but also surpass their English Only peers in word reading and pronunciation.

In this study, English Language Learners with the interventions (either multiple exposures or context) showed greater growth than the English Only students in all areas of word understanding assessed in this study, while English Language Learners who did not receive any intervention showed less growth than any of their English Only peers (those with or without the intervention). Interestingly, the students with the least vocabulary (CELDT 1 students) showed the greatest growth in all areas of word learning tested: word recognition, usage, and complexity. Based on this finding, if teachers of English Language Learners want their students to overcome the vocabulary deficit they enter school with, then they must provide parents with interventions that give students more exposures to key vocabulary words and provide directions on how to go over these words at home. The deficit seems overwhelming at times, but this research shows that vocabulary deficits that English Language Learners and students of low socio-economic status face when entering school can not only be overcome, but those students with depressed vocabulary can even surpass their peers who do not have a vocabulary deficit if they are provided with multiple exposures interventions.

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Appendix A

Sample Summary Sheet of Raw Data

		Participant	1	2	3
		M/F	m	m	f
		Home Language	2	1	2
		CELDT Level	6	3	6
		Teacher	1	1	1
		Group	1	1	1
		Age (months)	79	72	77
Baseline	A1	WR	100.00%	73.33%	100.00%
		C	46	31	33
		U	100.00%	88.89%	88.89%
	A2	WR	100.00%	46.43%	96.43%
		C	53	49	48
		U	100.00%	88.89%	100.00%
	A3	WR	100.00%	51.52%	90.91%
		C	52	49	45
		U	88.89%	100.00%	88.89%
Intervention	A4	WR	100.00%	33.33%	100.00%
		C	60	50	54
		U	88.89%	100.00%	100.00%
	A5	WR	100.00%	62.07%	100.00%
		C	47	44	60
		U	100.00%	100.00%	100.00%
	A6	WR	100.00%	71.43%	100.00%
		C	47	46	56
		U	100.00%	100.00%	100.00%
Averages	Baseline	WR	100.00%	0.570923521	0.957792208
		C	50	43	42
		U	96.30%	0.925925926	0.925925926
	Intervention	WR	1	0.556102901	1
		C	51.33333333	46.66666667	56.66666667
		U	0.962962963	1	1
	Difference	WR	0	-0.01482062	0.042207792
		C	1	3.666666667	14.66666667
		U	0	0.074074074	0.074074074

Appendix B

Baseline and Experimental Assessments

(Theme 3 Week 1 through Theme 3 Week 3 = Baseline)
(Theme 4 Week 1 through theme 4 Week 3 = Experimental)

Theme 3 Week 1
Data

Word	**Child Said**	**Correct Phonemes**	**Numerical Value**
1. animal	_____	_____	_____
2. flower	_____	_____	_____
3. bird	_____	_____	_____
4. full	_____	_____	_____
5. see	_____	_____	_____
6. cold	_____	_____	_____
7. fall	_____	_____	_____
8. of	_____	_____	_____
9. look	_____	_____	_____

Theme 3 Week 1
Sentence Data

Word **Sentence**

1. animal _____

Analysis

Number of words	Complexity (# of Syllables)	Correct Usage (1=yes 0=no)
_____	_____	_____

Word **Sentence**

2. bird _____

Analysis

Number of words	Complexity (# of Syllables)	Correct Usage (1=yes 0=no)
_____	_____	_____

Word **Sentence**

3. cold _____

Analysis

Number of words	Complexity (# of Syllables)	Correct Usage (1=yes 0=no)
_____	_____	_____

Word **Sentence**

4. fall _____

Analysis

Number of words	Complexity (# of Syllables)	Correct Usage (1=yes 0=no)
_____	_____	_____

Word **Sentence**

5. flower _____

Analysis

Number of words	Complexity (# of Syllables)	Correct Usage (1=yes 0=no)

_____ _____ _____

Word **Sentence**

6. full _____

Analysis

Number of words | Complexity (# of Syllables) | Correct Usage (1=yes 0=no)

_____ _____ _____

Word **Sentence**

7. see _____

Analysis

Number of words | Complexity (# of Syllables) | Correct Usage (1=yes 0=no)

_____ _____ _____

Word **Sentence**

8. of _____

Analysis

Number of words | Complexity (# of Syllables) | Correct Usage (1=yes 0=no)

_____ _____ _____

Word **Sentence**

9. look _____

Analysis

Number of words | Complexity (# of Syllables) | Correct Usage (1=yes 0=no)

_____ _____ _____

Appendix C

Visual to Accompany Audiotape or CD for Intervention

Theme 4 Week 1

come	love
your	father
people	picture
mother	family
children	

Come – to arrive somewhere of move toward a person
I **come** to school everyday.
Can you **come** here?

Your – to belong to you
I like **your** idea.
Please bring **your** jacket.

People – human beings
I like all **people**.

Mother – a female parent *We say mom as a short way to say mother
I love my **mother**.

Children – a son or daughter
I like the **children** in my class.

Love – affection for someone or something
I **love** my mom and dad.
I **love** pizza.

Father – a male parent *We say dad as a short way to say father.
I love my **father**.

Picture – a visual image of a person or object
I draw a **picture** of my favorite animal.

Family – parents and their children
There are many people in my **family**.

Appendix D

Table of Observed Frequencies: Group Comparison WR

Group	Progress	No progress	Total	Expected Progress	Expected No Progress
1	14	20	34	14.17	19.83
2	4	5	9	3.75	5.25
3	7	10	17	7.08	9.92
Total	25	35	60	25	35

Chi Square

Group	Observed	Expected	O-E	(O-E)2/E
1 progress	14	14.17	.17	.002
2 progress	4	3.75	.25	.017
3 progress	7	7.08	-.08	.001
1 no progress	20	19.83	.17	.001
2 no progress	5	5.25	-.25	.012
3 no progress	10	9.92	.08	.001

Chi square = .034
df = 2

Table of Observed Frequencies: Group Comparison C

Group	Progress	No progress	Total	Expected Progress	Expected No Progress
1	21	13	34	20.97	13.03
2	6	3	9	5.55	3.45
3	10	7	17	10.48	6.52
Total	37	23	60	37	23

Chi Square

Group	Observed	Expected	O-E	(O-E)2/E
1 progress	21	20.97	.03	.000004
2 progress	6	5.55	.45	.036
3 progress	10	10.48	-.48	.022
1 no progress	13	13.03	-.03	.000007
2 no progress	3	3.45	-.45	.059
3 no progress	7	6.52	.48	.035

Chi square = .152
df = 2

Appendix E

Table of Observed Frequencies: ELL: WR

Group	Progress	No progress	Total	Expected Progress	Expected No Progress
ELL 1	15	12	27	16.875	10.125
ELL 2	5	3	8	5	3
ELL 3	10	3	13	8.125	4.875
Total	30	18	48	30	18

Chi Square

Group	Observed	Expected	O-E	(O-E)2/E
ELL 1 progress	15	16.875	-1.875	.208
ELL 2 progress	5	5	0	0
ELL 3 progress	10	8.125	1.875	.432
ELL 1 no progress	12	10.125	1.875	.347
ELL 2 no progress	3	3	0	0
ELL3 no progress	3	4.875	-1.875	.721

Chi square = 1.7
df = 2

Table of Observed Frequencies: ELL: U

Group	Progress	No progress	Total	Expected Progress	Expected No Progress
ELL 1	22	5	27	24.1875	3.9375
ELL 2	9	0	9	8.0625	1.3125
ELL 3	12	2	14	12.5416	2.04
Total	43	7	48	44.79	7.29

Chi Square

Group	Observed	Expected	O-E	(O-E)2/E
ELL 1 progress	22	24.1875	-2.1875	.2
ELL 2 progress	9	8.0625	.9375	.11
ELL 3 progress	12	12.5416	.5416	.02
ELL 1 no progress	5	3.9375	1.0625	.28
ELL 2 no progress	0	1.3125	1.3125	1.7
ELL3 no progress	2	2.04	.04	.0007

Chi square = 2.3
df = 2

Table of Observed Frequencies: ELL: C

Group	Progress	No progress	Total	Expected Progress	Expected No Progress
ELL 1	21	6	27	20.812	6.75
ELL 2	6	3	8	6.167	2
ELL 3	10	3	13	10.021	3.25
Total	37	12	48	37	12

Chi Square

Group	Observed	Expected	O-E	(O-E)2/E
ELL 1 progress	21	20.812	.188	.002
ELL 2 progress	6	6.167	.167	.005
ELL 3 progress	10	10.021	.021	.00004
ELL 1 no progress	6	6.75	.75	.083
ELL 2 no progress	3	2	1	.5
ELL3 no progress	3	3.25	.25	.019

Chi square = .609
df = 2

Appendix F

Table of Observed Frequencies: ELL Vs. EO: WR

Group	Progress	No progress	Total	Expected Progress	Expected No Progress
ELL 1	12	15	27	11.7	15.3
ELL 2	5	4	9	3.9	5.1
ELL 3	6	8	14	6.07	7.93
EO 1	2	5	7	3.03	3.97
EO 2	0	0	0	0	0
EO 3	1	2	3	1.3	1.7
Total	26	34	60	26	34

Chi Square

Group	Observed	Expected	O-E	(O-E)2/E
ELL 1 progress	12	11.7	.3	.008
ELL 2 progress	5	3.9	1.1	.310
ELL 3 progress	6	6.07	-.07	.00008
EO 1 progress	2	3.03	-1.03	.35
EO 2 progress	0	0	0	0
EO 3 progress	1	1.3	.3	.069
ELL 1 no progress	15	15.3	.3	.006
ELL 2 no progress	4	5.1	-1.1	.237
ELL 3 no progress	8	7.93	.07	.00007
EO 1 no progress	5	3.97	1.03	.267
EO 2 no progress	0	0	0	0
EO 3 no progress	2	1.7	.3	.053

Chi square = 1.3
df = 5

Table of Observed Frequencies: ELL Vs. EO: C

Group	Progress	No progress	Total	Expected Progress	Expected No Progress
ELL 1	17	10	27	16.65	10.35
ELL 2	6	3	9	5.55	3.45
ELL 3	8	6	14	8.63	5.37
EO 1	4	3	7	4.32	2.68
EO 2	0	0	0	0	0
EO 3	2	1	3	1.85	1.15
Total	37	23	60	37	23

Chi Square

Group	Observed	Expected	O-E	(O-E)2/E
ELL 1 progress	17	16.65	.35	.007
ELL 2 progress	6	5.55	.45	.036
ELL 3 progress	8	8.63	-.63	.092
ELL 1 no progress	4	4.32	-.32	.012
ELL 2 no progress	0	0	0	0
ELL3 no progress	2	1.85	.15	.012
EO 1 progress	10	10.35	-.35	.012
EO 2 progress	3	3.45	-.45	.059
EO 3 progress	6	5.37	.63	.074
EO 1 no progress	3	2.68	.32	.038
EO 2 no progress	0	0	0	0
EO 3 no progress	1	1.15	-.15	.02

Chi square = .362
df = 5

Appendix G

Table of Observed Frequencies: CELDT 1 WR

Group	Progress	No progress	Total	Expected Progress	Expected No Progress
1-1	4	3	7	4.9	2.1
1-2	1	0	1	.7	.3
1-3	2	0	2	1.4	.6
Total	7	3	10	7	3

Chi Square

Group	Observed	Expected	O-E	(O-E)2/E
1-1 progress	4	4.9	.9	.165
1-2 progress	1	.7	.3	.129
1-3 progress	2	1.4	.6	.257
1-1 no progress	3	2.1	.9	.386
1-2 no progress	0	.3	.3	.3
1-3 no progress	0	.6	.6	.6

Chi square = 1.837
df = 2

Table of Observed Frequencies: CELDT 1 C

Group	Progress	No progress	Total	Expected Progress	Expected No Progress
1-1	3	4	7	3.5	3.5
1-2	1	0	1	.5	.5
1-3	1	1	2	1	1
Total	5	5	10	5	5

Chi Square

Group	Observed	Expected	O-E	(O-E)2/E
1-1 progress	3	3.5	.5	.071
1-2 progress	1	.5	.5	.5
1-3 progress	1	1	0	0
1-1 no progress	4	3.5	.5	.071
1-2 no progress	0	.5	.5	.5
1-3 no progress	1	1	0	0

Chi square = 1.142
df = 2

Table of Observed Frequencies: CELDT 3 U

Group	Progress	No progress	Total	Expected Progress	Expected No Progress
1-1	6	4	10	7.22	2.8
1-2	5	0	5	3.61	1.4
1-3	2	1	3	2.17	.8
Total	13	5	18	13	5

Chi Square

Group	Observed	Expected	O-E	(O-E)2/E
1-1 progress	6	7.22	1.22	.206
1-2 progress	5	3.61	1.39	.535
1-3 progress	2	2.71	.71	.186
1-1 no progress	4	2.8	1.2	.514
1-2 no progress	0	1.4	1.4	1.4
1-3 no progress	1	.8	.2	.05

Chi square = 2.891
df = 2

Table of Observed Frequencies: CELDT 3 C

Group	Progress	No progress	Total	Expected Progress	Expected No Progress
1-1	8	2	10	7.22	2.8
1-2	3	2	5	3.61	1.4
1-3	2	1	3	2.17	.8
Total	13	5	18	13	5

Chi Square

Group	Observed	Expected	O-E	(O-E)2/E
1-1 progress	8	7.22	.78	.084
1-2 progress	3	3.61	.61	.103
1-3 progress	2	2.17	.17	.013
1-1 no progress	2	2.8	.8	.229
1-2 no progress	2	1.4	.6	.257
1-3 no progress	1	.8	.2	.05

Chi square = .736
df = 2

Table of Observed Frequencies: CELDT 4 WR

Group	Progress	No progress	Total	Expected Progress	Expected No Progress
1-1	3	1	4	2.67	1.33
1-2	1	2	3	2	1
1-3	4	1	5	3.33	1.67
Total	8	4	12	8	4

Chi Square

Group	Observed	Expected	O-E	(O-E)2/E
1-1 progress	3	2.67	.33	.04
1-2 progress	1	2	1	.5
1-3 progress	4	3.33	.67	.13
1-1 no progress	1	1.33	.33	.08
1-2 no progress	2	1	1	1
1-3 no progress	1	1.67	.67	.269

Chi square = 2.019
df = 2

Table of Observed Frequencies: CELDT 4 U

Group	Progress	No progress	Total	Expected Progress	Expected No Progress
1-1	4	0	4	3.67	.33
1-2	3	0	3	2.75	.25
1-3	4	1	5	4.58	.42
Total	11	1	12	11	1

Chi Square

Group	Observed	Expected	O-E	(O-E)2/E
1-1 progress	4	3.67	.33	.03
1-2 progress	3	2.75	.25	.02
1-3 progress	4	4.58	.58	.07
1-1 no progress	0	.33	-.33	.33
1-2 no progress	0	.25	-.25	.25
1-3 no progress	1	.42	.58	.8

Chi square = 1.5
df = 2

Table of Observed Frequencies: CELDT 4 C

Group	Progress	No progress	Total	Expected Progress	Expected No Progress
1-1	4	0	4	3.33	.67
1-2	2	1	3	2.5	.5
1-3	4	1	5	4.17	.83
Total	10	2	12	10	2

Chi Square

Group	Observed	Expected	O-E	(O-E)2/E
1-1 progress	4	3.33	.67	.135
1-2 progress	2	2.5	.5	.1
1-3 progress	4	4.17	.17	.007
1-1 no progress	0	.67	.67	.67
1-2 no progress	1	.5	.5	.5
1-3 no progress	1	.83	.17	.035

Chi square = 3.212
df = 2

Appendix H

Table of Observed Frequencies: AGE: C

Group	Progress	No progress	Total	Expected Progress	Expected No Progress
(70-74) 1	6	3	9	6.9	2.1
(70-74) 2	3	1	4	3.1	.93
(70-74) 3	0	1	1	.8	.23
(75-79) 1	12	3	15	11.5	3.5
(75-79) 2	2	0	2	1.5	.5
(75-79) 3	7	2	9	6.9	2.1
(80-85) 1	8	2	10	7.6	2.3
(80-85) 2	3	0	3	2.3	.7
(80-85) 3	5	2	7	5.4	1.64
Total	46	14	60	46	14

Chi Square

Group	Observed	Expected	O-E	(O-E)2/E
(70-74) 1 progress	6	6.9	.9	.12
(70-74) 2 progress	3	3.1	.1	.103
(70-74) 3 progress	0	.8	.8	.8
(75-79) 1 progress	12	11.5	.5	.06
(75-79) 2 progress	2	1.5	.5	.167
(75-79) 3 progress	7	6.9	.1	.001
(80-85) 1 progress	8	7.6	.4	.02
(80-85) 2 progress	3	2.3	.7	.21
(80-85) 3 progress	5	5.4	.4	.03
(70-74) 1 no progress	3	2.1	.9	.39
(70-74) 2 no progress	1	.93	.07	.005

(70-74) 3 no progress	1	.23	.77	2.6
(75-79) 1 no progress	3	3.5	.5	.07
(75-79) 2 no progress	0	.5	.5	.5
(75-79) 3 no progress	2	2.1	.1	.005
(80-85) 1 no progress	2	2.3	.3	.039
(80-85) 2 no progress	0	.7	.7	.7
(80-85) 3 no progress	2	1.64	.36	.3

Chi square = 6.12

df = 8