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Curriculum Vocabulary Acquisition Of 4th Graders Using A Language-sensitive Teaching Approach

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CURRICULUM VOCABULARY ACQUISITION OF 4th GRADERS USING A
LANGUAGE-SENSITIVE TEACHING APPROACH

by

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A thesis submitted in partial fulfillment of the requirements
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ABSTRACT

The purpose of this pilot study was to determine if a direct, explicit method of teaching vocabulary with a Vocabulary Scenario Technique-Language Sensitive protocol (VST-LS) would yield gains in the vocabulary knowledge of 4th grade students greater than those seen in 4th grade students receiving vocabulary instruction typical to some general education classrooms. VST-LS is a detailed description of procedures intended to be used by a teacher in a general education classroom for direct vocabulary instruction. The VST-LS protocol provides for 14 word encounters involving listening, reading, writing, and speaking. Forty-one 4th grade students consisting of 18 males and 23 females participated in the study. All participants were attending a suburban elementary school in a large urban-suburban school district.

Two 4th grade teachers at the suburban elementary school agreed to participate in the study. One of the teachers who agreed to participate in the study had previously participated in a Vocabulary Scenario Technique pilot study (Ehren, Zadroga, & Proly, 2010); therefore, her 4th grade classroom was designated as the treatment group and the second 4th grade classroom was designated as the comparison group. The treatment group received direct vocabulary instruction by a graduate student speech language pathologist (SLP) using the VST-LS protocol. The comparison group received vocabulary instruction by a 4th grade teacher using word study activities typical to some general education classrooms. Both the treatment group and the comparison group were taught 32 preselected curriculum vocabulary words across four consecutive weeks. Eight

words were taught per week, for four weeks, during three thirty minute instruction periods (dosage = 6 hours).

Two pre-test/post-test vocabulary measures, a multiple choice synonym test and a fill-in-the-blank/word-bank sentence test, were used to document both the treatment group and comparison group performances. Both the synonym pre-test and the sentence pre-test were administered to the treatment group and the comparison group one week prior to the commencement of the pilot study. Both the synonym post-test and the sentence post-test were administered to the treatment group and the comparison group one week after the conclusion of the study. A one way analysis of covariance (ANCOVA) was used to examine the treatment effects of the VST-LS protocol in comparison to treatment effects of vocabulary instruction typical to some classrooms.

The ANCOVA testing indicated that there was a statistically significant difference in post-test scores for both the synonym measure, $F(1, 35) = 14.76, p < .001$, and the sentence measure, $F(1, 34) = 43.66, p < .001$, between the treatment condition and the comparison condition, when controlling for pre-test scores on both the synonym measure and the sentence measure. A large effect size was demonstrated, indicated by group, in regard to both the synonym measure, partial $\eta^2 = .30$, and the sentence measure, partial $\eta^2 = .56$. On average, participants in the treatment condition scored higher on both the synonym measure ($M = 24.33, SE = 0.77$) and the sentence measure ($M = 26.24, SE = 0.76$) than did the study participants in the comparison condition (synonym measure: $M = 20.14, SE = 0.77$; sentence measure: $M = 19.03, SE = 0.78$).

The result of the VST-LS pilot study indicated that this method of direct vocabulary instruction was more successful in generating vocabulary gains in 4th grade students than was vocabulary instruction typically seen in general education classrooms. Additionally, the result indicated that the VST-LS protocol has potential as a viable, efficient method for teachers to use when directly teaching curriculum vocabulary words to 4th grade students in general education classrooms. A summary of the findings, limitations of the study, and suggestions for the direction of future research are discussed.

Dedicated to my parents

Leonard and Jean Spielvogel

Thank you for everything.

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LIST OF NOMENCLATURE

Language Intensive Protocol - A protocol based on the Vocabulary Scenario Technique (Ehren, 2008) intended to be used by speech-language pathologists' for direct vocabulary intervention in a classroom or therapeutic setting. The protocol provides for 24 word encounters involving listening, reading, writing, and speaking (Ehren, Zadroga, & Proly, 2010).

Language Sensitive Protocol – A protocol based on the Vocabulary Scenario Technique (Ehren, 2008) intended to be used by a teacher in a general education classroom for direct vocabulary instruction. The protocol provides for 14 word encounters involving listening, reading, writing, and speaking.

Morphology- “In language and reading, morphology refers to the study of the structure of words, particularly the smallest units of meaning in words: morphemes” (Kieffer & Lesaux, 2007).

Scaffolding- “an interactional mechanism for learning because the more capable teacher or speech-language pathologist provides graduated assistance to novices learners in order for them to achieve higher levels of conceptual or communicative competence” (Silliman, Bahr, Beasman, & Wilkinson, 2010).

Scenario- a two to five sentence story used in the Vocabulary Scenario Technique vocabulary instruction. The stories are developed to reflect student experiences and elucidate the meaning of the word (Ehren, 2010).

Tier 2 words- “words that are high frequency for mature language users and are found across a variety of domains” (Beck, McKeown, & Kucan, 2002).

CHAPTER ONE: INTRODUCTION

Statement of the Problem

Vocabulary knowledge is crucial for oral and written language development, and in turn, academic success (Beck et. al., 2002; Bromley, 2007; Harmon, Hedrick, & Wood, 2005; Hart & Risley, 2003). The United States has mandated that learning to read is a top educational priority (No Child Left Behind Act; 2001) and research has determined that vocabulary knowledge is a consequential element of proficient reading ability (Davis, 1944; Joshi, 2005; Montgomery & Hayes, 2005; Rupley & Nichols, 2005). Bromley (2007) noted that 70-80% of reading comprehension can be directly linked to vocabulary (i.e., word meaning); vocabulary and reading comprehension have a reciprocal relationship: word knowledge provides a platform for reading comprehension and reading provides a platform for vocabulary growth.

While research has illuminated the complementary relationship between vocabulary and reading comprehension, research has also determined that a definitional approach (i.e., instruction with a list of words paired with definitions), to vocabulary instruction to be ineffective and obsolete (Beck et. al., 2002; Berne & Blachowicz, 2009; Greenwood, 2002; Phillips, Foote, & Harper, 2008). Specifically, Stahl (1986) found the definitional approach to have a “nonsignificant” impact on reading comprehension. Yet, the definitional approach remains the predominate approach in general education classrooms (Berne & Blachowicz, 2009; Phillip et. al., 2008). Teachers have also indicated that they are unsure what method of vocabulary instruction should replace the

long-standing definitional approach (Berne & Blachowicz, 2009). The critical importance of vocabulary knowledge on language, reading, and academic success makes it imperative for future research to determine the most efficient and effective means of providing vocabulary instruction within the classroom setting (Beck & McKeown, 2007; Rupley, 2009; Rupley, Blair, & Nichols, 2009; Rupley & Nichols, 2005; Taylor, Mraz, Nichols, Rickelman, & Wood, 2009).

Purpose of the Study

The primary purpose of this pilot study was to determine if a direct, explicit method of teaching vocabulary with the Vocabulary Scenario Technique-Language Sensitive protocol (VST-LS) will yield gains in the vocabulary knowledge of 4th grade students. The VST-LS protocol was based on the principles of the Vocabulary Scenario Technique [VST] (Ehren, 2008) and is intended for teachers to use in general education classrooms. VST is an explicit instruction technique grounded in scenarios (i.e., 2-5 sentence stories) to teach vocabulary directly to school-age students (Ehren, 2008). The scenarios incorporate new vocabulary into “stories” which reflect student experiences and elucidate word meaning.

The scenarios provide a base for language-focused vocabulary instruction which includes listening, reading, writing, and speaking (Ehren, Zadroga, & Proly, 2010). VST allows the teacher and/or speech-language pathologist to provide scaffolding to students as they experience multiple encounters with the new vocabulary words [Ehren et. al., 2010] (see Appendix H for examples of scenarios). The VST-LS protocol is called a

“language sensitive” instructional tool because it incorporates fourteen listening, reading, writing, and speaking word encounter opportunities to promote vocabulary acquisition.

Ehren et. al., (2010) conducted a VST pilot study using a more language intensive VST protocol (VST-LI) to teach vocabulary to 4th grade students with 24 word encounters per word and 6 words taught per week over 6 weeks for a total of 36 words (dosage = 9 hours). VST-LI is intended to be used by a speech-language pathologist (SLP) to explicitly teach vocabulary to students. Two classrooms at an elementary school in an urban district participated in that study. The two classrooms of 4th grade students, each with approximately 25 students, were either the treatment or control condition. Another 4th grade class was randomly selected from three classrooms to participate in a pre/post test validation group to vet the synonym and sentence measure used in the study. The results for the treatment group in this study were statistically significant, $F(1, 41) = 27.68, p < .001$, partial eta-squared = .40. Due to the statistical significance of the treatment effect, VST-LI shows promise as a viable instruction method to teach vocabulary to 4th grade students.

However, an approach with that intensity, although effective, may not be practical for teachers to implement. Therefore, the current study investigated the efficacy of a less intense protocol, called a “language sensitive” protocol involving 14 word encounters per word with 8 words taught per week over 4 weeks for a total of 32 words (dosage = 6 hours) with 4th grade students in a general education classroom. Therefore, a secondary purpose of this study was to investigate VST treatment intensity (i.e., whether or not 14 word encounters would yield comparable vocabulary gains seen with the VST-LI

protocol). In comparison to the VST-LI protocol, the VST-LS protocol has reduced word encounters per word, in order to allow the teacher to teach more words per week, while still affording the students an opportunity to have multiple encounters with each new word through listening, reading, writing, and speaking. See Appendix F for the VST-LS protocol.

Assumptions

- 1) VST-LS instruction will be provided in a manner that allows vocabulary learning opportunities to be equivalent for all students in the treatment group classroom.
- 2) The word study vocabulary instruction will be provided in a manner that allows vocabulary learning opportunities to be equivalent for all students in the comparison group classroom.
- 3) The students in both the treatment group classroom and the comparison group classroom will employ their best effort when completing the pre-test/post-test synonym and sentence vocabulary measures.
- 4) The multiple choice synonym test and the fill-in-the-blank/word-bank sentence test will measure vocabulary gains in participating 4th grade students.

Research Questions

- 1) Will 4th grade students receiving VST-LS instruction, with fourteen encounters per word, eight words taught per week over 4 weeks, demonstrate greater gains on a multiple-choice synonym test than 4th grade students taught the same number of words in the same time frame using a vocabulary teaching protocol typically employed by a 4th grade teacher.
- 2) Will 4th grade students receiving VST-LS instruction, with fourteen encounters per word, eight words taught per week over 4 weeks, demonstrate greater gains on a fill-in-the-blank/word-bank sentence test than 4th grade students taught the same number of words in the same time frame using a vocabulary teacher protocol typically employed by a 4th grade teacher.
- 3) Will 4th grade students receiving VST-LS instruction demonstrate comparable gains on both the multiple-choice synonym test and the fill-in-the-blank/word-bank sentence measure.
- 4) Will 4th grade students in the comparison group receiving vocabulary instruction from a teacher demonstrate comparable gains on both the multiple-choice synonym test and the fill-in-the-blank/word-bank sentence measure.

Significance of the Study

The relationship among vocabulary knowledge, academic success, and literacy development has been well established (Berne & Blachowicz, 2008; Bromley, 2007; Montgomery & Hayes, 2005; Spencer & Guillaume, 2006). Once a student falls behind

peers in vocabulary development and early literacy acquisition, the discrepancies in achievement between poor readers and proficient readers increase as they transition into the higher grades; this phenomena is termed the “vocabulary gap” (Beck et. al., 2002; Fisher & Blachowicz, 2005; Coyne et. al., 2007; Kieffer & Lesaux, 2007).

In particular, children entering the fourth grade are faced with escalating literacy demands as they are expected to comprehend increasingly difficult text in order to progress academically (Biancarosa & Snow, 2004). With this increased demand, children who enter the fourth grade with reading comprehension difficulties, possibly precipitated by limited lexicons, demonstrate a recurring and significant drop in their reading scores (Hirsch, 2003). This notable decline in reading scores demonstrated by some students entering the fourth grade has been coined “the fourth grade slump” by a well-known reading researcher, Jean Chall (Hirsch, 2003).

After the fourth grade, the reading scores of students with noted comprehension deficits continue a steady decline as they advance through middle school and high school (Hirsch, 2003). In order to close the “vocabulary gap” and break the cycle of academic failure many American children face as they enter fourth grade, educators and researchers must find a viable means of increasing word knowledge through vocabulary instruction within the classroom setting. Additionally, the amount of vocabulary instruction intensity (i.e., dosage) needed to effectively impact reading comprehension and promote vocabulary gains remains unclear in the research. Conducting research on instructional techniques like VST-LS is a vital step in the development of evidence-based vocabulary instructional protocols which also include research-validated dosage levels. The current

study determined if the VST-LS protocol yielded gains in 4th grade students in a general education classroom, and if the dosage of 14 encounters per word would yield similar vocabulary gains seen in the more language-intensive VST protocol [VST-LI] (Ehren, et. al., 2010).

Limitations of the Study

- 1) The researcher who conducted the study was a graduate student speech language pathologist trained to use the VST-LS protocol to teach vocabulary to the treatment group.
- 2) The students were already assigned to their classrooms at the beginning of the school year, which did not allow the researcher to randomly assign students to the treatment or comparison groups.
- 3) The teacher for the treatment classroom previously participated in the VST-LI (2010) pilot study and therefore, the classrooms as a whole could not be randomly assigned to be either the treatment or the comparison condition. As a result, the classroom for the teacher who had previously participated in the VST-LI (2010) pilot study had to be designated as the treatment condition.
- 4) Due to time constraints (i.e., the study was conducted at the end of the school year), the longevity of vocabulary gains precipitated by VST-LS instruction were not examined by administering the measures (synonym and sentence) to the treatment group after a period of time had elapsed to ensure the stability to the vocabulary gains.

- 5) Pre-test synonym and sentence scores, from both the treatment and comparison group, indicated that the corpus of 32 *Tier 2* words (Beck et. al., 2002) were more than 50% known by the students. If time had permitted, a new corpus of curriculum-based *Tier 2* words (Beck et. al., 2002) would have been selected and vetted for the current study.
- 6) Partial-eta squared, which was generated by the Statistical Package for Social Sciences to represent the “degree of practical significance” when the data were analyzed for the VST-LS study, may be inflated due to the relatively small number of students who participated in the study (synonym measure, $N = 38$; sentence measure, $N = 37$).

CHAPTER TWO: LITERATURE REVIEW

This chapter will review the literature regarding the role vocabulary plays in the development of language, literacy, academic success, reading comprehension, and reading fluency. In addition, this chapter will address the necessity of direct vocabulary instruction in the general education classroom, as well as the importance of determining vocabulary instruction intensity for the development of efficient, effective methods for teachers to employ regularly.

Vocabulary: A Key Ingredient to Literacy

Vocabulary knowledge is a key ingredient to literacy (Beck, McKeown, & Kucan, 2002; Bromley, 2007; Harmon, Hendrick, & Wood, 2005; Jitendra, Edwards, Sacks, & Jacobson, 2004). Literacy encompasses listening, reading, writing, and speaking (Ehren, 2002); and, vocabulary knowledge can be linked to proficiency in all areas of literacy (Berne & Blachowicz, 2008; Bromley, 2007; Montgomery & Hayes, 2005; Spencer & Guillaume, 2006). Consequently, literacy is essential to an individual's ability to succeed academically, economically, and vocationally in the United States (Biancarosa & Snow, 2004; Blachowicz & Fisher, 2004). Oral language is the platform for later reading and writing development, while vocabulary underpins oral language development and literacy (Biemiller, 2001; Hirsch, 2003).

Additionally, oral language, vocabulary knowledge, and reading have a reciprocal relationship: each skill builds upon the other and promotes growth respectively (Coyne

et. al., 2007). The vocabulary used by students when speaking and listening provides a base for the vocabulary they will later use to read and write (Bromley, 2007). Stahl & Fairbanks (1986) determined that having a large vocabulary (oral and written) positively influenced student comprehension and produced higher achievement test scores. Crow (1986) posited that a person's receptive vocabulary (i.e., understanding of a word in listening and reading) is particularly important for reading comprehension. Beck et. al. (2002) asserted that an extensive vocabulary allows students to become educated adults by supporting academic achievement and reading proficiency. Additionally, vocabulary instruction must be combined with decoding and comprehension development in order for a reading program to be effective and balanced (Rupley & Nichols, 2005).

Children who have low vocabulary knowledge are at-risk for reading difficulties upon entering school (Fisher & Blachowicz, 2005). While a significant amount of vocabulary knowledge is acquired through incidental exposure from reading, for students who have limited vocabularies and reading difficulties, incidental exposure alone is not an effective means for them to overcome their deficits as they progress through the early grades (Baumann, 2009; Beck et. al., 2002). Research has demonstrated that if a student enters the fourth grade with a vocabulary deficit, their comprehension of grade-level texts will suffer (Chall & Jacobs, 2003; Kieffer & Lesaux, 2007; NICHD, 2000; RAND Reading Study Group, 2002). When a student is unable to comprehend grade-level reading material, academic failure is often the result (Biancarosa & Snow, 2004). The resultant academic failure documented in many of these students (grades 3-12) can be

directly linked to an insufficient vocabulary (Becker, 1977; Ebbers & Denton, 2008; Fisher & Blachowicz, 2005).

When examining academic failure precipitated by reading comprehension deficits, the role of vocabulary must be addressed. The inter-student “vocabulary gap” that appears as children advance through school is a well-documented phenomenon. Children who enter school with a vocabulary deficit due to a myriad of reasons (e.g., poverty, lack of world experiences, disability, and learning English as a second language) lag behind in literacy when compared to children who enter school with an average to large vocabulary. Unfortunately, once this “vocabulary gap” is established, and literacy development is depressed, deficits are extremely difficult for students with limited lexicons to overcome (Beck et. al., 2002; Biemiller, 2003; Juel, 1988; Justice & Pullen, 2003; Montgomery Hayes, 2005; Spencer & Guillaume, 2006).

The “Matthew effect”.

One notable theoretical explanation for the inability for the majority of students to overcome the “vocabulary gap” is the “Matthew effect”. The “Matthew effect”, named after the Gospel according to Matthew, describes the educational phenomenon of the “rich getting richer and the poor getting poorer” (Merton, 1968; Stanovich, 1986; Walberg & Tsai, 1983). In relation to vocabulary and reading proficiency, students who have rich, early literacy experiences (e.g., print exposure, literacy-rich environments) may have an academic “cumulative advantage” over students who had poor early literacy experiences (Stanovich, 1986). For instance, Nagy and Anderson (1984) speculated that

children who have low reading motivation read an estimated 900,000 fewer words than children who are average readers. Children who struggle to read for a variety of reasons have truncated vocabulary growth due to the fact that their “reading volume” is significantly less when compared to students who are proficient readers (Stanovich, 1986). As a result, children who are good readers also have good vocabularies; good readers read more, which in turn promotes further vocabulary growth [i.e., rich getting richer] (Stanovich, 1986).

Notably, children who struggle to read often have reduced vocabularies and derive less pleasure from reading; readers who struggle to read inevitably read less, which in turn impedes vocabulary growth [i.e., poor getting poorer] (Stanovich, 1986). Furthermore, children who are good readers shape their environment to further advance their literacy [e.g., asking for books as presents, associating with children who like to read, and choosing to read over other leisure activities] (Stanovich, 1986). On the other hand, children who are poor readers are not self-motivated to adjust their environment to promote literacy experiences (Stanovich, 1986).

Children who had rich, early literacy exposure appear to have several additional advantages over children with a dearth of early literacy exposure. First, good readers have more contact with written language as they progress through school, which expands their domain knowledge and promotes the ability to infer meaning for novel vocabulary words (Stanovich, 1986). Secondly, good readers may be able to acquire words into their lexicon from context with more competence than students who are poor readers (Stanovich, 1986). The “Matthew effect” attempts to explain the vocabulary and reading

discrepancies among school age children. If the “Matthew effect” provides a legitimate explanation for the reading failure seen in a percentage of school age children, then it further substantiates the necessity for direct vocabulary instruction in the general education classroom. Without explicit instruction, readers who struggle may be primed for difficulty in all aspects of literacy, including reading fluency and reading comprehension (Rupley, 2009; Stahl & Bravo, 2010).

Vocabulary and reading fluency.

Vocabulary growth also significantly impacts a companion reading pillar noted in the No Child Left Behind (2001) and Reading First Legislation (2002): reading fluency. Reading fluency is essential for students who are learning to read; likewise, reading fluency is also essential when students are reading to learn (Rupley, 2009). Reading fluency entails reading accuracy, reading smoothness, and reading at a reasonable pace (Montgomery & Hayes, 2005). Fluent readers draw from larger vocabularies and understand more encountered words, which in turn allows them to read at a quick pace (Bromley, 2007). In order for students to become fluent readers, they must have solid automatic word recognition (Montgomery & Hayes, 2005). Successful readers have already mastered decoding skills which allows the reader’s working memory to focus on the comprehension process (Boulware-Gooden, Carreker, Thornhill, & Joshi, 2007; Hirsch, 2003).

Readers who struggle often develop deficits in reading fluency, demonstrating an inability to ‘chunk’ phrases into comprehensible units (Rupley, 2009). Readers in the

early stages must acquire a stockpile of sight words in order to reduce processing pressures (Montgomery & Hayes, 2005). Readers with smaller vocabularies lag behind their peers in the number of words they know automatically (e.g., sight words); this lack of sight words increases the demands on cognitive processes, which in turn makes reading for information laborious and tedious (Montgomery & Hayes, 2005). As in all other language and literacy areas impacted by lack of vocabulary, children who are disfluent readers tend to avoid reading; this reading avoidance starts an intractable cycle of reading and academic failure (Harmon et. al., 2005; Montgomery & Hayes, 2005).

Vocabulary and reading comprehension.

In addition to the critical importance of vocabulary on reading fluency, a strong vocabulary is also critical to reading comprehension (Berne & Blachowicz, 2008; Biemiller, 2003; Bromley, 2007; Davis, 1944; Stahl & Bravo, 2010; Taylor et. al., 2009; Verhoeven & Van Leeuwe, 2008). Reading comprehension can be defined as an individual's ability to understand the meaning of the written word (Tannenbaum, Torgesen, & Wagner, 2006). Reading comprehension and vocabulary knowledge have a synergistic relationship: vocabulary is necessary for comprehension, while comprehension serves to further enlarge the vocabulary (Bromley, 2007; Kieffer & Lesaux, 2007; Rupley et. al., 1999).

As textbooks become increasingly complex, reading comprehension becomes highly dependent on vocabulary knowledge (Becker, 1977; Coyne et. al., 2007; Richek, 2005; Simmons, Hairrell, Edmonds, Vaughn, Larsen, Willson, Rupley, & Byrns, 2010).

Hirsch (2003) noted that in order for meaningful reading comprehension to occur, students must know 90-95% of the words of a written text. When a student understands 90-95% of the words in a required text, they are able to infer the meaning of the 5-10% of the words which are unfamiliar to them (Hirsch, 2003). Additionally, children with limited vocabulary knowledge have reduced ability to infer meaning when they are presented with unfamiliar words in texts (Rupley et. al., 1999). This lack of lexical and processing flexibility impedes the reader who struggles from validating learned concepts as well as acquiring new concepts (Rupley et. al., 1999); this chain reaction solidifies the struggling reader's poor comprehension and reinforces the reading deficit.

The Fourth Grade Slump

As students conclude the third grade, they are expected to synthesize their vocabulary knowledge, decoding skills, fluency, and cognitive processes which promote comprehension (Becker, 1977; Chall & Jacobs, 2003). Researchers and educators have repeatedly observed depressed reading scores among a segment of students, particularly those from low SES families, as they enter the fourth grade (Chall & Jacobs, 2003; Kieffer & Lesaux, 2007). This notable decline in reading scores has been termed the "fourth grade slump" (Hirsch, 2003). By the time students enter the fourth grade, they are expected to apply their previously learned literacy skills to aid in comprehension of increasingly complex texts (Chall & Jacobs, 2003). Those students with limited lexicons are faced with curriculum reading material which is too complex to comprehend (Biemiller, 2003).

Many of the complex and unfamiliar concepts introduced at the 4th grade level are difficult for even proficient readers to grasp (Biancarosa & Snow, 2004; Harmon et. al., 2005). However, proficient readers have the ability to draw from previous domain knowledge (i.e., topic knowledge) while using reasoning skills to infer meaning from recondite text (Hirsch, 2003). On the other hand, readers who struggle are ill-equipped to comprehend the content material required for academic success, and as mentioned previously, these readers are often unable to apply metacognitive skills to improve comprehension (Harmon, et. al., 2005). Kieffer & Lesaux (2007) cite the introduction of academic vocabulary into the curriculum as a “particular source of difficulty” for students entering the fourth grade. Baumann & Graves (2010) delineate five distinct types of academic words encountered by upper elementary and middle school students: domain-specific vocabulary, general academic vocabulary, literary vocabulary, metalanguage, and symbols.

In particular, domain-specific academic vocabulary and general academic vocabulary create immediate challenges for both readers who are proficient and readers who struggle as they enter the upper-elementary grades. Domain-specific academic vocabulary includes words found in content area textbooks (e.g., median, mode, standard deviation), and are considered to be low-frequency words (Baumann & Graves, 2010; Marzano & Pickering, 2005). General academic vocabulary (e.g., context, evaluate, integrate), which is also found in content area texts, will be encountered by students with moderate frequency (Baumann & Graves, 2010).

Upon entering the fourth grade, proficient readers with solid foundational literacy skills will begin to acquire academic vocabulary which will aid in their comprehension, and mastery of, academic material that is specific to content areas (Baumann & Graves, 2010). However, struggling readers, as well as proficient readers with weaker foundational literacy skills (e.g., decoding, fluency, vocabulary knowledge), will experience difficulty comprehending grade-level texts (Biancarosa & Snow, 2004; Kieffer & Lesaux, 2007). Ultimately, students who have deficits in vocabulary and reading proficiency are put on a path of academic failure as they enter middle school and high school (Harmon et. al., 2005).

The Complexity of Word Knowledge

Further complicating the impact of vocabulary on the reading proficiency and comprehension of upper elementary school students is the fact that word knowledge is multidimensional and complex (Beck et. al., 2002). Knowing the definition of a word does not mean that the word is known by the student (Greenwood, 2002). In addition to the word's literal definition, it is necessary to know how the word relates to other words and concepts, how it operates differently across contexts, and how morphology transforms the word as needed (Coyne, McCoach, Loftus, Zipoli, & Kapp, 2009; Kieffer & Lesaux, 2007). Students have acquired both vocabulary breadth (i.e., the number of definable words accessible to the student) and depth of vocabulary (i.e., the extent to which words in the lexicon are known) when they are able to understand the multiple aspects of word knowledge (Kieffer & Lesaux, 2007; Stahl & Bravo, 2010).

Beck et. al. (2002) further elucidated the complex concept of word knowledge by dividing word knowledge into two distinct categories: extent of knowledge and qualitative differences. Extent of knowledge includes the following subcategories: no knowledge, general sense, narrow-context bound, having knowledge (known but not readily usable), and rich-decontextualized knowledge. Additionally, Beck and colleagues (2002) expand on qualitative categories, using Cronbach's 1942 description; Cronbach's (1942) qualitative categories include generalization (definable), application (select appropriate use), breadth (multiple meanings known), precision (uses properly consistently), and availability (actual use across modalities). The complex and abstruse nature of word knowledge must be taken into account by educators and researchers as they develop strategies to both teach and assess vocabulary (Beck et. al., 2002).

Research-Based Vocabulary Instruction: An Overview

Recently, there has been a renewed interest in general classroom vocabulary instruction generated, in part, by the Reading First Initiative (2002) which designated vocabulary as a foundational pillar for reading comprehension. Due to this renewed interest, surveyed teachers on RTEACHER listserv, an online community resource for elementary school educators, indicated that they want district-wide vocabulary programs which would provide uniform instruction across classrooms and would replace the definitional approach (Berne & Blachowicz, 2009). It is unlikely that there will ever be a single instructional method that will sufficiently promote vocabulary learning across grade levels; however, research has revealed guidelines that shape effective, direct

vocabulary instruction to promote word knowledge in elementary, middle, and high school students (Beck et. al., 1982; McKeown et. al., 1983; Beck et. al., 2002; Duff et. al., 2008, Stahl, 1986, Stahl & Fairbanks, 1986). Research has demonstrated that direct/explicit vocabulary instruction can increase reading comprehension when instruction combines definitional information, contextual information, and encourages cognitive processing through multiple, interactive encounters with the word (Baumann, 2009; Beck et. al., 2002; Stahl & Fairbanks, 1986).

Direct and explicit vocabulary instruction.

Research has established that direct and explicit instruction is a viable means of teaching vocabulary and is a necessary component of an integral reading program (Baumann, 2009). Vocabulary instruction is direct and explicit when it involves “active, reflective, and meaningful interactions” between the teacher and the student (Rupley et. al., 2009). Additionally, direct and explicit vocabulary instruction combines opportunities for teacher/student exchanges and opportunities for scaffolding (i.e., modeling, demonstrating, and/or explaining) from the teacher (Rupley et. al., 2009). In essence, the role of the teacher to “facilitate learning” is paramount for direct and explicit vocabulary instruction (Taylor et. al., 2009).

Coyne, McCoach, Loftus, Zipoli, Ruby, Crevecoeur, & Kapp (2010) examined the impact of an 18 week direct/extended vocabulary instruction program on word knowledge and generalized language/literacy. The researchers conducting this study also examined if pre-intervention receptive vocabulary levels were correlated to performance

on post-intervention measures. The vocabulary instruction provided was direct and extended; 80 kindergarten students participated as the treatment group and 44 students participated as the no-treatment control. All of the students who participated in the study attended elementary schools that predominately serve a population considered at-risk for reading failure.

The students were taught 54 vocabulary words during the 18 week period. Definitional information was provided during story read-aloud sessions; sessions occurred twice a week for 30 minutes each (dosage = 18 hours). The read-aloud sessions were interactive and students were provided with an opportunity to hear the new word used in context after a definition was provided. Additionally, the students were asked to say the new vocabulary word before they were provided an opportunity to interact with the words through structured activities. Posttest measures included targeted word knowledge, listening comprehension, metalinguistic skill (i.e., the ability to make inferences when encountering an unfamiliar word), and general vocabulary ability. Researchers used the Peabody Picture Vocabulary Test, 3rd Edition [PPVT-III] (Dunn & Dunn, 1997) to measure general vocabulary knowledge pre and post intervention.

Result of the regression analyses (Type I error rate set at $p < .10$), indicated that there were significant differences between the treatment groups and the control group for target word knowledge (corrected $p < .01$), on the post-test administration of the PPVT-III (and overall vocabulary knowledge (corrected $p = .07$). The findings of this study paralleled a growing body of evidence that direct vocabulary instruction is beneficial for both word learning and listening comprehension. Additionally, the researchers concluded

that the result of the study indicated that vocabulary instruction may also promote word learning independence among students (i.e., increased metalinguistic awareness).

Simmons et. al. (2010) investigated the effects of explicit and direct multiple-strategy methods on the reading comprehension and vocabulary development of fourth grade students. Three experimental conditions were examined: comprehension (C), content vocabulary (V), and typical practice (TP). Nine hundred and eleven fourth-grade students from 61 social studies classes participated. Teachers instructing students in the C and V conditions were asked to include 90 minutes of strategy instruction a week for 18 weeks (dosage = 27 hours). Additionally, teachers in the experimental conditions engaged in 18 hours of professional development.

During the first 6-week period, 4-6 words were taught per week, and the words were chosen according to their importance to comprehending content text. Teachers used researcher-developed vocabulary maps to review definitions, view illustrations, root word identification, practice with the word in context, associate new words with related vocabulary, and use the word in a sentence or definition. Students were afforded multiple exposures to each new vocabulary word (number of encounters was not specified by researchers) through word association games, summary activities, and activities which required the students to create sentences using multiple vocabulary words.

During the second 6-week phase, “anticipation guides” were used to activate the background knowledge of the students. During the third 6-week phase, students were taught to use context and morphological clues in order to infer the meaning of the new vocabulary words. Four numbers were reported for each outcome variable and predictor

variable: the unstandardized path weight (B), the standard error, standardized path weight (B) as an ES in standard deviation units, and the significance level. Results indicated that when compared to the “typical practice” model, the comprehension condition and the vocabulary condition groups outperformed the “typical practice” model on the Social Studies Vocabulary Subtest. For the “comprehension condition”, the standardized path coefficient [ES (B)] was .50 ($B = 1.72, p = .02$). The standardized path coefficient from vocabulary to the content assessment was .54 ($B = 1.86, p = .03$). The standardized path coefficient from vocabulary to the *Curriculum-Based Vocabulary Assessment* (CBA-V) was, .74 ($B = 5.91, p < .001$). Specifically for vocabulary gains, at posttest, students in the vocabulary condition knew approximately six more words than did the students in the “typical practice” condition on the CBA-V. Additionally, small to moderate effect sizes were seen in both the comprehension condition (ES = .31) and the vocabulary condition (ES = .36) on the *Test of Reading Comprehension, Social Studies Vocabulary Subtest* (TORC-3 SS).

Coyne et. al. (2007) conducted two separate studies (Study One and Study Two) to examine vocabulary intervention for kindergarten students. In Study One, the researchers compared extended explicit vocabulary instruction (i.e., teaching that included both contextual and definitional information, multiple exposures to target words in varied contexts, and experiences with the target words to promote deeper processing of word meanings) to “incidental exposure” to the study’s targeted words (i.e., students in this control condition heard the targeted words during storybook reading, but the words were not directly taught). In Study Two, the researchers compared extended explicit

vocabulary instruction with embedded vocabulary instruction (i.e., simple definitions were provided within the context of the story).

In Study One, 31 students participated in the study (i.e., 15 males, 16 females; 20 Caucasian, 11 Hispanic). The average age of the participants was 5:10 and the mean Peabody Picture Vocabulary Test (PPVT) score was 98.52 ($SD = 14.44$). Vocabulary words were taught within the context of storybook reading; instruction was interactive and allowed for deeper processing and multiple encounters with target words. Extended explicit vocabulary instruction occurred 5 minutes per word, for a total of 15 minutes per word, across three story book readings and also included opportunities for students to interact with the target words beyond the storybook reading time. Students' expressive definition performance on words taught with extended explicit instruction was significantly higher than their performance on the incidental exposure words, $F(1, 30) = 104.36$, $p < .001$. A similar statistical significance was seen on receptive definitions measures, $F(1, 30) = 40.96$, $p < .001$. Additionally, statistical significance was seen for extended instructional words on the context measure, $F(1, 30) = 29.45$, $p < .001$.

Study Two compared extended explicit vocabulary instruction to embedded instruction. Thirty-two participants were included in Study Two (22 males, 10 females; 23 Hispanic, 5 African American, 2 Asian, and 2 Caucasian). The average age was 5:11 and the mean PPVT score was 95.81 ($sd = 9.89$). Extended direct vocabulary instruction was the same in Study Two as in Study One; embedded instruction included simple definitions of words encountered in the story. As in Study One, students who received extended direct vocabulary instruction showed significantly higher scores than those

students receiving embedded vocabulary instruction, $F(1, 30) = 93.073, p < .001$.

Students receiving extended instruction in Study Two also scored higher on receptive definition measures, $F(1, 30) = 21.05, p < .001$; they also scored higher on the context measure, $F(1, 3) = 30.87, p < .001$. The results indicated that explicit vocabulary instruction increased word knowledge in kindergarten children, and explicit vocabulary instruction out-performed both embedded instruction and incidental exposure.

Pany, Jenkins, and Schreck (1982) examined the impact effects of direct vocabulary instruction on the word knowledge and reading comprehension of “average” fourth grade readers, learning disabled fourth graders, and remedial fourth grade readers. Three separate experiments were employed; the same twenty-four vocabulary words were in each other three experiments. Twelve fourth graders (8 females, 4 males; ages 9-10 years) participated in Experiment 1 and were considered to be “average” fourth graders who were reading at a fourth grade level or above. Experiment 1 had four treatment conditions: meanings from context, meanings given, meanings practiced, and no meanings control.

In the “meanings from context” condition, students did not receive direct instruction; students read two sentences, one sentence contained the target word and the second sentence contained a synonym for the target word. In the “meanings given” condition, students read a sentence which contained the target word, then the researcher provided both the meaning of the target word and a sample sentence using the targeted word in a manner in which the student may have heard it used in their daily lives. In the “meanings practiced” condition, students read a single target word and then the

researcher provided a synonym and sample sentence which used the target word; the students then repeated the target word and synonym. In the “no-meanings control” condition, students read the target word which was printed on an index card. The result of the data analyses revealed that the direct instructional method that had the most teacher-provided instruction (i.e., meanings practiced) outperformed the other two direct conditions where teacher-provided instruction was reduced (i.e., meanings from context and meanings given). All three direct teacher-provided measures out-performed the “no meanings” control group where teacher-provided instruction was not provided. “Meanings Practiced” means were significantly higher than “Meanings Given” ($p < .01$). “Meanings Practiced” and “Meanings Given” means were larger than the means of “Meanings Form Context” and “No-Meanings Control” ($p < .01$).

Experiment 2 examined the effectiveness of the three instructional conditions from Experiment 1 when applied to remedial readers. Six students participated in Experiment 2 (4 fourth and fifth grade females; 2 sixth grade males; ages = 10-13 years). Similar conditions were applied to Experiment 2 from Experiment 1. Results of the analysis indicated that the “Meanings Practiced” condition produced significant pre to posttest gains on all dependent measures (i.e., isolated-word, multiple choice, sentence anomaly, sentence paraphrase, isolated word delayed, multiple choice delayed) used in the study, $F(1,35) = 9.72, p < .01$. No significant gains were observed for either the “No-Meanings Control” or the “Meanings in Context” conditions on any dependent measure, $F(1, 35) = 2.84, p > .05$.

Experiment 3 examined whether or not vocabulary instruction which exactly mirrored the “Meanings Practiced” condition instruction from Experiment 1 and 2 improved reading comprehension of passages. Ten fourth graders (6 males, 4 females; ages = 10-12 years) participated in the study. Two conditions, synonym instruction (similar to the “Meanings Practiced” instruction provided in Experiment 1 and Experiment 2) and no instruction control, were compared. Twenty-four vocabulary words used in Experiment 1 and 2 were used. Results of analyses indicated that the direct vocabulary instruction (i.e., synonym instruction) positively impacted the reading comprehension of passages in fourth grade students: $t(9) = 4.8, p < .01$.

The researchers concluded that both “average” students and students with disabilities benefited the most from the “Meanings Practiced” and “Synonym” conditions where direct teacher-provided vocabulary instruction was at the highest treatment intensity level when compared to the “Meanings Given”, “Meanings From Context” and “No-Meanings” conditions where vocabulary instruction was “less intense” (i.e., “Meanings Given” or absent (Meanings From Context and No-Meanings)). Additionally, the researchers concluded that direct vocabulary instruction is a viable method to help students expand their vocabulary knowledge, particularly if the students have disabilities or have limited lexicons.

Ultimately, research has demonstrated that direct and explicit vocabulary instruction is a vital instructional method through which students are encouraged to be actively involved in the process of acquiring new words into their lexicons (Rupley & Nichols, 2005; Taylor et. al., 2009). However, the question of appropriate treatment

intensity (i.e., instructional dosage) for direct and explicit vocabulary instruction remains unclear. It is important to understand the level of dosage required to influence vocabulary knowledge, as well as reading comprehension, while still taking into consideration the limited amount of time teachers have to devote to vocabulary instruction (Baumann, 2009).

Explicit vocabulary instruction and treatment intensity.

While research has delineated components which are necessary in order for vocabulary instruction to enhance reading comprehension (Coyne et. al., 2010; Coyne et. al., 2007; Taylor et. al., 2009; McKeown et. al., 2009; Stahl & Fairbanks, 1986), research has yet to establish the specific parameters of vocabulary instruction treatment intensity; the question of “how much” exposure to a word is necessary to impact vocabulary knowledge and reading comprehension remains unclear. The question of dosage for vocabulary instruction efficacy is important for researchers to answer because duration of treatment, commonly used by SLPs, does not provide information about the proper intensity needed for the “active ingredient” (i.e., the procedures believed to enhance new learning or behavior) to be most effective. Currently, in the literature, the number of word encounters investigated in regard to vocabulary knowledge range from 1 word encounter (Webb, 2007) to 40 word encounters (Beck, Perfetti, & McKeown, 1982). In order to examine treatment intensity of the “active ingredient”, treatment episodes (i.e., number and types of word encounters during vocabulary instruction) must be defined and quantified (Warren et. al., 2007).

Beck & McKeown (2007) conducted two studies that investigated instruction intensity which involved “rich” vocabulary instruction to increase the oral vocabulary of low SES kindergarten and first graders. Study 1 included four kindergarten classrooms and four first grade classrooms ($n = 121$). The students in Study 1 were all African American and 82% of the participants qualified for free or reduced-cost lunches. Text Talk (Beck & McKeown, 2001; McKeown & Beck, 2003), a read aloud vocabulary intervention, was used as a vehicle to conduct rich vocabulary instruction. The teachers selected Tier 2 words (Beck et. al., 2002) from the story and conducted vocabulary instruction after the story was read. Additionally, the teachers would explain the meanings of the selected words as they were encountered during the read-aloud. The result indicated that both the instructed kindergarten group, $F(1, 45) = 15.93, p = .000$, and the instructed first grade group, $F(1, 51) = 7.25, p = .010$, showed greater gains in vocabulary than the comparison kindergarten group and the comparison first grade group.

In Study 2, additional instruction was added to the intervention of Study 1. The additional instruction was termed ‘More Rich Instruction’ and included increased word encounter frequency and duration. The children in Study 2 were African American and 81% qualified for reduced-cost or free lunches. Three kindergarten classes and three first grade classes participated in Study 2. Students received instruction for six words per week; they received instruction similar to Study 1 on three of the six words, but received More Rich Instruction on the final three of the six words. The authors determined that 6.6 minutes of instructional time was spent per word on the Rich Instruction words, while 27.6 minutes was spent per word on More Rich Instruction words. The authors also

estimated that students experienced 5 encounters per word of Rich Instruction words and 20 encounters per word of More Rich Instruction words. While gains were seen in both treatment conditions, gains were nearly doubled during the More Rich Instruction during which student's experienced longer durations and more encounters with the words. The number of More Rich Instruction words known was significantly higher than Rich Instruction words known ($F(1, 35) = 69.47, p < .001$).

Webb (2007) investigated the effects of word encounters on the vocabulary knowledge of 121 Japanese students who were learning the English language. The impact of 1, 3, 7, and 10 word encounters was investigated. Participants of the study were randomly assigned to four separate treatment conditions. The participants in treatment condition 1 encountered the target word one time, the participants in treatment condition 3 encountered the target word three times, the participants in treatment condition 7 encountered the target word seven times, and the participants in treatment condition 10 encountered the target words ten times. The control group did not have any exposure to the target vocabulary words.

In this study, dosage was viewed within the context of incidental vocabulary learning through progressive word exposure treatment conditions. Ten dependent measures were used to assess vocabulary knowledge. Analyses of data indicated that treatment condition 10 (i.e., ten word encounters) demonstrated significant gains when compared to treatment condition 1 (i.e., one word encounter) on all measures of word knowledge presented in the study. Three encounters yielded greater learning on every measure when compared to one word encounter, while seven encounters yielded similar

gains on receptive measures, but demonstrated larger gains on measures of production vocabulary knowledge. Ten word encounters demonstrated significantly larger gains than did seven word encounters on four of the ten measures (receptive and productive). The researcher concluded that, while there was not a specific number of repetitions that could guarantee vocabulary learning in individuals who were learning English as a second language, ten encounters with a word during reading may have a significant impact on vocabulary growth.

McKeown, Beck, Omanson, & Pople (1985) conducted a study to investigate the impact of two separate components of vocabulary instruction on word knowledge and use. The two components investigated were 1) nature of the instruction and 2) frequency of instructional encounters. The participants of the study were 4th graders from three separate schools located in an urban school system; the school district in which the study was conducted serves a predominately low SES demographic and was 70% African American. Three classrooms were selected to be treatment groups and one classroom was selected to be the control group. Three intervention types were investigated: traditional definitional, rich instruction, and extended/rich instruction. The researchers conducted 12 instructional lessons for 30 minutes for a period of two weeks (dosage = 6 hours) and taught 24 words. Two frequency conditions were established: high = 12 instructional encounters for six words and low = 6 instructional encounters for six words.

Rich instruction included a seven day cycle that included definitional information and usage activities for both the high frequency and low frequency target words, student created log-sheets for their vocabulary words, sentence completion activities, word

association tasks, compare/contrast tasks, and true-false mastery tests (given on the 7th day of each cycle). Extended/rich instruction mirrored rich instruction, but students were afforded the opportunity to earn points to become a ‘word wizard’ if they could provide evidence that they had used, or encountered, targeted vocabulary words beyond the 30 minute intervention period. During traditional/definitional instruction, students were provided with definitions and synonyms for targeted vocabulary words. The control group did not deviate from their typical language-arts curriculum during the course of the two week study.

The analyses of the data revealed that all the types of instruction were better than no instruction at all, and that frequency of word encounters had the greatest impact on gains than did instructional type. Additionally, students who received extended/rich instruction had quicker reaction times to high and low encounter words ($p < .05$) than did the students who received rich or traditional/definitional instruction. Students who received traditional/definitional and rich instruction responded faster to high encounter words ($p < .05$). In regard to context interpretation, a post hoc test showed that extended/rich and rich instruction groups performed at the same level and were reliably greater than that of the traditional-instruction group, $p < .01$. In regard to the influence of vocabulary instruction on story comprehension, five comparisons between the common-words story and the high and low-encounter-word stories for all three instructional methods revealed reliable differences in story comprehension, $t(21) > 2.0$, $p < .05$.

The researchers concluded that the traditional/ definitional approach was sufficient to promote word knowledge, but did not necessarily impact comprehension.

Additionally, the researchers concluded that more word encounters created greater gains in word knowledge, access to word meanings, context interpretation, and story comprehension (i.e., the higher the amount of word encounters, the greater the gains in all areas assessed). In regard to treatment type, extended/rich was more successful in aiding students when making semantic related decisions and recalling stories than were the other two types of instruction (i.e., traditional/definitional or rich).

Beck et. al. (1982) conducted a study to investigate the impact that word knowledge had on lexical access and reading comprehension. A vocabulary program was created for the study; 104 target words were selected and taught during 75 daily lessons which were 30 minutes in duration. The researchers created two frequency conditions (some = 10-18 word encounters; many = 26-40 word encounters). The participants of the study were low SES fourth graders from an urban school district. In regard to vocabulary knowledge, all main effects and all two way interactions were shown to be significant, but the authors noted that the significant three way interaction between Group X Test X Word Type, $F(2, 88) = 32.85, p < .001$, was the most important result from the analysis because a contrast indicated that the largest component of this interaction was the contrast of 'none' versus 'some' and 'many' for the participants, $F(1, 44) = 139.19, p < .001$. Additionally, the authors noted that the comparison between 'some' and 'many' word encounters was significant, $F(1, 44) = 7.88, p < .01$. The result of the study indicated that the vocabulary intervention influenced vocabulary knowledge, semantic knowledge, and reading comprehension amongst low SES fourth grade students.

Researchers in the area of vocabulary instruction must continue to examine treatment intensity in order to insure treatment efficacy (Baumann, 2009; Warren et. al, 2007). Determining appropriate treatment intensity in order for vocabulary instruction to impact both vocabulary knowledge gains and reading comprehension is a complex issue that needs to be resolved, which makes it is a critical area for future research (Baumann, 2009). Determining vocabulary treatment efficacy is imperative for educators and clinicians as they endeavor to quell the growing population of students who are primed for reading failure.

Summary

A student's vocabulary breadth and depth are intrinsic to reading comprehension, reading fluency, and academic success (Beck et. al., 2002; Davis, 1944; Rupley, 2009). Vocabulary research has been successful in creating a body of knowledge that delineates necessary components (i.e., definitional information, contextual information, and multiple word encounters) of vocabulary instruction that are critical in order to significantly impact reading comprehension (Beck et. al., 1983; Beck et. al., 2002; Coyne et. al, 2010; Lovelace & Stewart, 2009; McKeown et. al., 1985). Additionally, vocabulary researchers have begun the difficult task of determining appropriate vocabulary instructional dosage that will impact vocabulary knowledge and reading comprehension while still remaining sensitive to tight curriculum time-constraints imposed on teachers working in the public school system (Beck & McKeown, 2007; Beck et. al., 1983; McKeown et. al, 1985). Incidental learning of vocabulary is not a

sufficient means of vocabulary acquisition for many students entering public school, which makes direct, explicit vocabulary instruction a necessity in order for these students to succeed academically, socially, and vocationally (Baumann, 2009; Beck et. al., 2002). Ultimately, researchers have an obligation to continue to define the parameters of vocabulary instruction, as well as treatment intensity, in order to best serve students at-risk for reading and academic failure.

CHAPTER THREE: METHODOLOGY

This chapter will delineate the methodology of the Vocabulary Scenario Technique – Language Sensitive pilot study. All of the areas of methodology listed below will be discussed:

- 1) A general description of the study location and specific participant characteristics for treatment and comparison groups.
- 2) A description of teacher qualifications for both the treatment and comparison groups.
- 3) Data gathering procedures will be described, including a description of the VST-LS protocol and materials, the vocabulary instructional method to be used by the comparison group teacher, VST-LS treatment fidelity procedures, and the comparison group treatment verification procedures.
- 4) The method used to obtain the corpus of vocabulary words to be taught, pre/post test measures with rationale for development, and a proposed analysis of data.
- 5) Data analysis procedures.

Description of the Population

The study took place at a suburban elementary school in a large urban-suburban school district. The school has 61 teachers, all of whom are considered to be “highly qualified” according to the Orange County Public School (OCPS) Improvement Plan,

2010-2011. The school population is approximately 965 students (49% White, 34% Hispanic, 10% African American, 8% Asian, and 1% other). In 2009, 29% of the student population was eligible for both free and reduced lunch. In June 2010, 90% of the students at the school obtained a Level 3 or above score on Florida Comprehensive Assessment Test (FCAT) Reading [FCAT scores are rated 1 through 5 with 5 being the high score; a student must earn a score of 3 to advance to the next grade] (<http://fcat.fldoe.org/fcatscor.asp>), 73% made gains in reading, and 62% of the students who were ranked part of the 25% lowest scores made gains in reading. In the same period, 92% of students at the elementary school scored at a Level 3.5 or above on the FCAT Writing.

Description of treatment group.

Twenty students participated in the treatment group. The treatment group included ten females and ten males. Ethnicity of the treatment group was as follows: nine students were Caucasian, six students were Hispanic, four students were African-American, and one student was Native American. Four students received ESL (English as a Second Language) services. One student was eligible for Specific Learning Disabled Services and received speech and language intervention. FCAT Reading Scores (3rd grade) were as follows: one student scored a 2, two students scored a 3, ten students scored a 4, four students scores a 5, and three students did not have available scores. The classroom teacher for the treatment group had six years teaching experience and has only taught 4th grade. She has a B.S. in Elementary Education and an ESOL endorsement.

Description of comparison group.

Twenty-one students participated in the comparison group. The comparison group included thirteen females and eight males. Ethnicity of the comparison group was as follows: six students are Caucasian, eleven were Hispanic, two were African-American, and one was Asian. Four students received ESL services. One student was listed as specific learning disabled and language impaired; this student received speech-language services for language. One student was listed as speech-impaired and received speech-language services. One student was listed as gifted. FCAT Reading Scores (3rd grade) were as follows: two students scored a 1, four students scored a 3, nine students scored a 4, three students scored a 5, and three students had unavailable scores. The comparison group teacher has five years teaching experience and has only taught the 4th grade. The teacher had a Bachelors degree in English with a specialization in children's literature and a Masters degree in Elementary Education. The comparison group teacher also held an ESOL endorsement.

Data Gathering Procedures

The VST-LS pilot study was conducted across four consecutive weeks. The same thirty-two preselected vocabulary words were taught to both the treatment and comparison groups. Both the treatment and comparison groups were taught the same eight preselected words each week for a total of thirty-two words learned. Vocabulary instruction for both the treatment group and the comparison group was conducted for thirty minutes, three times a week, for four weeks (dosage = 6 hours). The treatment

group received VST-LS instruction (described below) from the researcher, a graduate student in speech-language pathology. The comparison group received “typical” vocabulary instruction provided by the classroom teacher whose class was being used as the comparison group. This “typical” instruction is described below in the comparison group section. Both the researcher and the comparison group teacher used no more than thirty minutes a week for vocabulary lesson preparation and thirty minutes a day, three days a week for four weeks for instruction. Prior to the beginning of the study, the VST-LS Data Collection Forms (see Appendix A) were used to record student information and pre-test scores for both the treatment group and the comparison group. At the conclusion of the study, post-test scores were added to the VST-LS Data Collection Forms.

Treatment protocol.

The treatment group received direct, explicit vocabulary instruction by the researcher using the VST-LS protocol (see Appendix F). Materials needed for the four week study include a visual display of the vocabulary scenarios, four different colors of index cards (one for each week) for the students to create “portable word walls”, a regular hole punch to punch holes in the index cards prior to the beginning of the study, metal rings to hold the “portable word walls” together, a decorative hole punch, the VST-LS protocol with scenarios, a list of possible synonyms for target words, VST-LS fidelity check lists, VST-LS data collection forms, and pre/post test measures.

On Day 1 of Week 1 of the study, the index cards for the blank “portable word walls” held together with metal rings were distributed. The “portable word walls” were

used by the students throughout the four week period. The students wrote each target vocabulary word on a separate “portable word wall” index card. Then, the students wrote synonyms for the target word along with a sentence which used the target word that had been generated by a fellow classmate. Each week, eight differently colored index cards were passed out to the students to add to their “portable word walls”. Four preselected words were taught on Day 1 (see Appendix G). The students experienced ten encounters with each of the four words. On Day 2 of Week 1, four preselected words were taught and the students had ten encounters with each of the four words.

At the conclusion of Day 1, the students were shown how to put together their “portable word walls” with the provided metal rings. This activity was not included in the thirty minutes of vocabulary instruction. On Day 3, the students received a review of the eight words taught on Day 1 and Day 2. The researcher facilitated four encounters with each of the eight words. On Day 3, when a student was able to explain the meaning of a word and use it in a sentence, the researcher used the decorative hole punch to punch a hole in the “portable word wall” where the word was written. This process was repeated across four consecutive weeks until thirty-two words were taught during thirty minute teaching sessions, three times per week (dosage = 6 hours).

Comparison group instruction.

The comparison group teacher taught the same thirty-two vocabulary words in a manner which was “typical” of her vocabulary instruction. According to the comparison group teacher, the students learned the thirty-two words by engaging in a word study

activity that involved several steps (see Appendix J). The first step was to define the word by looking it up in the dictionary or a text book. Once the word was defined, the students determined if there were any prefixes or suffixes that can aid them in understanding the meaning of the word. Next, the students were asked to use the word in a meaningful sentence and discuss how the word was used in the sentence. Whenever possible the students “acted out” the word. Finally, once the students had a “good grasp” of the word, the teacher and students used the word as many times as they could for the rest of the week.

Corpus of Words

The same thirty-two words were taught to both the treatment and the comparison group (see Appendix G). The thirty-two words were selected from the original thirty-six used in a previous VST-LI pilot study (Ehren et. al., 2010). The researcher who conducted the pilot study selected 128 tier-two words (Beck et. al., 2002) from science and social studies text books. A panel of five 4th grade teachers then was asked to select a corpus of words from the 128 words that would be the most important for comprehension of curriculum material. The panel of teachers narrowed the corpus of words to a list of 80.

A synonym test was developed from the corpus of 80 words and was administered to a 4th grade classroom which was not participating as either a treatment or control group. Based on the results of the synonym test, a corpus of 48 words was selected, which met the criteria of more than 50% of the 4th grade students not knowing the word.

The synonym test was then given to the treatment group and the control group. After the researcher who conducted the pilot study analyzed the results of the tests given to the treatment group and control group, the researcher then created a corpus of thirty-six words from the words which were missed most frequently. For the current study, four words were deleted from the original thirty-six corpus of words. The researcher from the VST-LS pilot study examined the synonym and sentence pre-tests for both the treatment and control groups and selected the four words for deletion which were “most known” out of the thirty-six (i.e., students scored correctly on these four words more than the other thirty-two words).

Instrumentation

Students in both the treatment group and the comparison group were given two pretest/posttest vocabulary measures. The National Reading Panel (2000) reported that researcher-developed vocabulary measures are “more sensitive” to vocabulary gains achieved through vocabulary instruction than can be determined by the administering of standardized measures. The synonym test (see Appendix B & D) was developed for, and used in, the VST-LI pilot study (Ehren et. al., 2010). The fill-in-the-blank/word-bank sentence test (see Appendix C & E) was developed for the current study as a second pretest/posttest measure; the sentence test was based on information gleaned from *Assessing Vocabulary* by Read (2001). Fill-in-the-blank sentence tests with word-banks are considered to be a reasonable method by which to assess vocabulary learning gains (Read, 2001). However, due to the nature of the corpus of words, it was not syntactically

feasible to position the “blank” at the end of each sentence as was demonstrated in Read’s (2001) *Assessing Vocabulary*.

During the development of the sentence measure, the thirty-two target vocabulary words were separated into sections based upon part of speech (i.e., adjectives, nouns, verbs) in order to reduce “parts of speech” clues. Additionally, verbs were further separated by tense (i.e., all past-tense verbs were placed together in one segment of the sentence measure). Sentences were constructed in a manner that would minimize syntactic clues. The sentences were also constructed in a manner that reduced syntactic demands (i.e., syntactic structure was deliberately simplistic).

A foil was created for each target vocabulary word in each of the seven sections. Foils were determined using the guidelines set forth by the National Assessment Governing Board [NAGB] (2011), a 26-member panel of educators, testing experts, lawmakers, and curriculum experts, which sets policies for National Assessment of Educational Progress (NAEP); according to the NAGB, vocabulary assessment foils can include: 1) a word that has a more common meaning than the target word, but must be ignored due to context clues, and 2) other words that look or sound similar to the target word. For the purposes of the sentence measure, foils used in each section were appropriate for the part-of-speech represented by that section (i.e., noun foils for noun target words).

Once the fill-in-the-blank/word-bank measure was completed, it was administered to a general education fourth grade class (N=20) in the same school that the VST-LS pilot study took place. After the administered pilot tests were scored, each question and foil

was analyzed to determine whether or not it would be included in the final version of the sentence measure. Any sentences that were problematic, syntactically or contextually, were reworded or replaced. Any foils that were problematic due to the fact that they could be reasonably used in place of the target word in any of the sentences were replaced. A final fill-in-the-blank/word-bank measure was created from the information gleaned from the results of the piloted sentence test.

Synonym and sentence measure administration.

The pre-tests were administered to both the treatment and the comparison groups during the week directly preceding Week 1 of the study. The synonym measure and the sentence measure were administered on separate days during the week directly preceding Week 1 of the study. The questions on both the synonym and sentence measures were scrambled in order to create post-test measures. Post-test synonym and sentence measures were administered to both the treatment group and the comparison group during the week directly following Week 4 of the study. The sentence test and the synonym measures were administered to both groups on separate days.

Fidelity of Treatment

VST-LS Fidelity Checklists (see Appendix I) were used to ensure the fidelity of treatment that was provided to the treatment group. The VST-LS included a checklist for Day 1, Day 2, and Day 3. The checklists allowed an independent rater, who was trained in the VST techniques, to check “yes” or “no” to determine if the specified four words

have been taught on Day 1 and Day 2, and if ten encounters had been provided for each of the four words. The Day 3 fidelity checklist provided the independent rater to check “yes” or “no” to determine if the specified eight words have been reviewed, and if four encounters for each word has been provided. All three checklists provided an area for making comments or for noting if additional encounters were provided.

The checklists also monitor if the specified cues were provided to the students as well as confirming the period of time instruction was provided. The fidelity checks were conducted across all three thirty minute VST-LS teaching sessions in both week two and week four, for a total of 50% of the study. The graduate student SLP recorded all thirty minutes VST-LS instructional sessions during the four week study; the recordings were used by the school SLP, who is familiar with VST procedures, to conduct fidelity checks. The result of the fidelity checks using the VST-LS fidelity checklists indicated that fidelity of treatment was at 95% and approximately 14-15 word encounters were noted for week two and week four.

Comparison Group Instruction Verification

A verification checklist was created based on the typical vocabulary instruction model provided to the researcher by the comparison group teacher (see Appendix J). The school speech-language pathologist conducted intervention verification checks on the comparison group once a week for each of the four consecutive weeks of the study (total = 4). Two of the four intervention verification checks were conducted in person (i.e., the school speech-language pathologist was present in the classroom while the comparison

group teacher taught the vocabulary words). Two of the four intervention verification checks were conducted through recordings provided by the comparison group teacher and examined by the school speech-language pathologist.

The result of the four intervention verification checks indicated that, according to the sampling, the comparison group teacher taught the corpus of thirty-two words (eight words per week) during the four consecutive weeks of the study. The comparison group teacher conducted vocabulary instruction three times a week for no more than thirty minutes per session (i.e., 1.5 hours per week). And, the comparison group teacher consistently used the vocabulary instructional method that she indicated was typical for her prior to the beginning of the study (i.e., defining the words, identifying prefixes and suffixes, using the words in a sentence, and “acting out” the words if applicable).

Data Analyses

The following section will delineate the parameters of the data analyses conducted for the VST-LS pilot study:

1. Statistical Package for the Social Sciences (SPSS) was used to check data for duplicate entry, entry differences, and out of range scores following the initial entry of data.
2. A one way analysis of covariance (ANCOVA) was used to determine the differences in synonym and sentence posttest scores based on intervention type (VST-LS – treatment group and “typical” vocabulary instruction – comparison group) when controlling for synonym and sentence pretest scores.

3. A mixed-model analysis of variance (mixed-model ANOVA) test was employed to jointly analyze research question three and research question four. The mixed-model ANOVA was used to determine whether students made different gains in either the synonym or the sentence test for either the treatment or comparison group. The analysis was two dimensional: first, it addressed whether student gains differed between the measure types (synonym or sentence), and secondly, whether the gains differed similarly within the treatment group as in the comparison group.

CHAPTER FOUR: RESULTS

This chapter will describe the analyses of data collected during the VST-LS study conducted across four consecutive weeks. The primary purpose of this pilot study was to determine if a direct, explicit method of teaching vocabulary with the Vocabulary Scenario Technique-Language Sensitive protocol (VST-LS) will yield gains in the vocabulary knowledge of 4th grade students. A secondary purpose of this study was to investigate VST treatment intensity (i.e., whether or not 14 word encounters would yield comparable vocabulary gains seen with the VST-LI protocol). The VST-LS pilot study is a quasi-experimental pretest-posttest comparison group design which posed four research questions discussed below.

Prior to the analyses of the four research questions, the homogeneity of the pre-test scores for both measures (synonym and sentence) was examined, and it was determined that the treatment group and the comparison group were equivalent prior to the commencement of intervention (VST-LS and Typical Instruction). One student from the treatment group was excluded from the synonym measure analyses due to the fact that the student did not have a pre-test score (N=19). Two students from the comparison group were excluded from the synonym measure analyses due to the fact that the students did not have either a pre or post-test score (N=19).

One student from the treatment group was excluded from the sentence measure analyses due to the fact that the student did not have a pre-test score (N=19). Three students from the comparison group were excluded from the sentence measure analyses

due to the fact that the students did not have either a pre or post-test score (N=18). Students in both the treatment and comparison groups who did not have scores for both pre and post-test measures because they were absent on the days that the tests were administered were not included in the analyses (i.e., treated-only analysis). At the conclusion of the study, thirty-seven students were included in the analyses for the synonym measure, and thirty-eight students were included in the analyses for the sentence measure. VST-LS fidelity of treatment was at 95% and approximately 14-15 word encounters were noted for week two and week four.

Analysis: Research Question One

Research question one: will 4th grade students receiving VST-LS instruction, with fourteen encounters per word, eight words taught per week, demonstrate greater gains on a multiple-choice synonym test than 4th grade students taught the same number of words in the same time frame using a vocabulary teaching protocol typically employed by a 4th grade teacher. A one-way analysis of covariance (ANCOVA) was conducted to determine if 4th grade students who received VST-LS vocabulary instruction demonstrated greater gains on a multiple-choice synonym test than did 4th grade students who received vocabulary instruction typically seen in a classroom setting.

The ANCOVA determined the mean difference between post-test performance on the multiple-choice synonym measure between 4th grade students in the two different intervention types (treatment or comparison) while controlling for the students' performance on the pre-test measure. The dependent variable was 4th grade students'

(N=38) performance on the post-test multiple-choice synonym measure, the independent variable was intervention group (treatment or comparison), and the covariate was 4th grade students' (N=38) performance on the pre-test multiple-choice measure.

The assumptions of multicollinearity, normality, and homogeneity were tested in order to establish the viability of the use of ANCOVA to test research question one. In regard to multicollinearity, the ANCOVA model was run with a term representing the interaction between the independent variable (i.e., intervention group) and the covariate (i.e., pre-test performance on the multiple-choice synonym measure). The result indicated that pre-test was an appropriate covariate for the ANCOVA due to the fact that there was not an interaction effect between intervention group and the covariate, $F(1,34) = 0.36, p = .55$.

In regard to the establishment of the assumption of curve normality, the distribution of the residual value was examined for skewedness (i.e., symmetry of the curve) and kurtosis (i.e., peakedness of the curve). Additionally, the value Shapiro-Wilk formal test of normality was examined. The assumption of normality was satisfied due to the fact that skewedness (-0.60) and kurtosis (0.26) were between -2 and 2, and the result of the Shapiro-Wilk test was non-significant: $W(38) = 0.97, p = .31$. The result of Levene's Test of Equality of Error Variances, $F(1,36) = 0.01, p = .99$, provided sufficient evidence to claim homogeneity of variance between the treatment group and the comparison group post-test performance.

ANCOVA testing for research question one indicated that there was a statistically significant difference in post-test multiple-choice synonym score between the comparison

and treatment groups when controlling for pre-test multiple-choice synonym score: $F(1, 35) = 14.76, p < .001$. Additionally, there was also a large effect size degree of practical significance indicated by the group type: partial $\eta^2 = .30$. Thirty percent of the variability in post-test multiple-choice synonym score could be explained by the group to which the student belonged. The covariate of pre-test multiple-choice synonym score was also significant, $F(1, 35) = 15.59, p < .001$, which further confirmed its value of remaining in the model.

On average, those in the treatment group scored higher ($M = 24.33, SE = 0.77$) than those in the comparison group ($M = 20.14, SE = 0.77$), while controlling for pre-test score (17.32). Table 1 depicts the result of the ANCOVA and Table 2 depicts the descriptive statics for intervention effect on the multiple-choice synonym test.

Table 1. ANCOVA Results, Intervention Effect on Synonym Test (N = 38)

Source	<i>df</i>	<i>F</i>	η^2	<i>p</i>
Intervention Group	1	14.76**	.30	< .001
Synonym Pre-Test	1	15.59**	.31	< .001
<i>S</i> within-group error	35	(10.98)		

Note. Value enclosed in parentheses represents mean square error. *S* = subjects.

* $p < .05$. ** $p < .01$.

Table 2. Descriptive Statistics, Intervention Effect on Synonym Test (N = 38)

Group	<i>M</i>	<i>SE</i>	95% Confidence Interval	
			Lower	Upper
Treatment (<i>n</i> = 19)	24.33	0.77	22.78	25.88
Comparison (<i>n</i> = 19)	20.14	0.77	18.59	21.70

Note. Covariate evaluated at Synonym Pre-Test = 17.32.

Analysis: Research Question Two

Research question two: Will 4th grade students receiving VST-LS instruction, with fourteen encounters per word, eight words taught per week, demonstrate greater gains on a fill-in-the-blank sentence test than 4th grade students taught the same number of words in the same time frame using a vocabulary teaching protocol typically employed by a 4th grade teacher. A one-way analysis of covariance (ANCOVA) was used to determine if 4th grade students who received VST-LS vocabulary instruction demonstrated greater gains on a fill-in-the-blank/word-bank sentence test than did 4th grade students who received vocabulary instruction typically seen in a classroom setting,.

The ANCOVA was used to determine the mean difference between post-test performance on the fill-in-the-blank/word-bank sentence measure between 4th grade students in the two different intervention types (treatment or comparison) while controlling for the students performance on the pre-test measure. The dependent variable was 4th grade students' (N=37) performance on the post-test fill-in-the-blank/word-bank sentence measure, the independent variable was intervention group (treatment or

comparison), and the covariate was 4th grade students' (N=37) performance on the pre-test sentence measure.

The assumptions of multicollinearity, normality, and homogeneity were tested in order to establish the viability of using ANCOVA to test research question two. To determine multicollinearity for research question two, the ANCOVA model was run with a term representing the interaction between the independent variable (i.e., intervention group) and the covariate (i.e., pre-test performance on the fill-in-the-blank/word-bank sentence measure). The result indicated that pre-test was an appropriate covariate for the ANCOVA due to the fact that there was not an interaction effect between intervention group and the covariate, $F(1,33) = 1.14, p = .29$.

In regard to the establishment of the assumption of curve normality, the distribution of the residual value was examined for skewedness and peakedness, as well as the value of the Shapiro-Wilk formal test of normality. The assumption of normality was satisfied due to the fact that skewedness (-0.15) and kurtosis (0.82) were between -2 and 2, and the result of the Shapiro-Wilk test was non-significant: $W(37) = 0.97, p = .29$. The result of Levene's Test of Equality of Error Variances, $F(1,35) = 2.02, p = .16$, provided sufficient evidence to claim homogeneity of variance between the treatment group and the comparison group post-test performance.

The results of the ANCOVA testing for research question two indicated that there was a statistically significant difference in post-test fill-in-the-blank/word-bank sentence measure scores between the treatment and comparison groups when controlling for the pre-test fill-in-the-blank/word-bank sentence test score: $F(1, 34) = 43.66, p < .001$.

Additionally, there was also a large effect size indicated by the group type: partial $\eta^2 = .56$. Fifty-six percent of the variability in post-test fill-in-the-blank/word-bank sentence score could be explained by the group to which the student belonged. The covariate of pre-test fill-in-the-blank/word-bank sentence scores were also significant, $F(1, 34) = 54.90, p < .001$, which further confirmed its value of remaining in the model. On average, those in the treatment group scored higher ($M = 26.24, SE = 0.76$) than those in the comparison group ($M = 19.03, SE = 0.78$), while controlling for pre-test score (17.54). Table 3 depicts the result of the ANCOVA and Table 4 depicts the descriptive statics for intervention effect on the sentence measure.

Table 3. ANCOVA Results, Intervention Effect on Sentence Test (N = 37)

Source	<i>df</i>	<i>F</i>	η^2	<i>P</i>
Intervention Group	1	43.66**	.56	< .001
Sentence Pre-Test	1	54.89**	.62	< .001
<i>S</i> within-group error	34	(10.98)		

Note. Value enclosed in parentheses represents mean square error. *S* = subjects.

* $p < .05$. ** $p < .01$.

Table 4. Descriptive Statistics, Intervention Effect on Sentence Test (N = 37)

Group	<i>M</i>	<i>SE</i>	95% Confidence Interval	
			Lower	Upper
Treatment (<i>n</i> = 19)	26.24	0.76	24.69	27.78
Comparison (<i>n</i> = 19)	19.03	0.78	17.44	20.62

Note. Covariate evaluated at Sentence Pre-Test = 17.54.

Analysis: Research Questions Three and Four

Research question three: will 4th grade students receiving VST-LS instruction demonstrate comparable gains on both the multiple-choice synonym test and the fill-in-the-blank/word-bank sentence measure?

Research question four: will 4th grade students in the comparison group receiving vocabulary instruction from a teacher demonstrate comparable gains on both the multiple-choice synonym test and the fill-in-the-blank/word-bank sentence measure?

A mixed-model analysis of variance (mixed-model ANOVA) test was employed to jointly analyze research question three and research question four. The mixed-model ANOVA was used to determine whether students made different gains in either the synonym or the sentence test for either the treatment or comparison group. The analysis was two dimensional: first, it addressed whether student gains differed between the measure types (synonym or sentence), and secondly, whether the gains differed similarly within the treatment group as in the comparison group. Pre-post difference score served

as the dependent variable in this analysis, measure type (synonym or sentence) served as the repeated measure, and intervention group (treatment or comparison) served as the independent variable.

Prior to the commencement of the analysis, several steps were taken to ensure that a mixed-model ANOVA was the appropriate analysis to answer these questions. The first step was to determine if the pre-test measures (synonym and sentence) were equivalent. A dependent *t*-test was run for all participants in the VST-LS study (both treatment and comparison groups) to determine whether or not the multiple-choice synonym or fill-in-the-blank sentence measure pre-test scores differed significantly for the same student. The test, $t(36) = 0.04, p = .97$, indicated that, on average, there was not a significant difference in pre-test performance for the two measures (synonym pre-test: $M = 17.57, SD = 3.97$; sentence pre-test: $M = 17.54, SD = 5.80$) for individual students. Due to the fact that the pre-test synonym measure and the pre-test sentence measure were equivalent, the pre-test scores were then averaged to produce a performance starting point for each study participant.

Secondly, performance cut-points were established. In order to circumvent questions regarding differences in variability between participants in the treatment group versus participants in the comparison group, each intervention condition (treatment or comparison) was isolated from the other. For each intervention condition, averaged pre-test scores were segmented into quartiles and grouped accordingly; all groups contained between four and six students.

Thirdly, in order to determine homogeneity of variance among the difference scores, quartile group was used as the independent variable for a total of four tests. Each of the four tests were run for the difference variables for the pre-post difference in synonym and sentence scores for both the treatment group and the comparison group. The result of the four tests indicated that difference scores were acceptable for analysis due to the fact that none of the groups indicated heterogeneity in variability for difference scores among study participants in different portions of the beginning range of test performance (Synonym Test, Treatment Group: $F(3, 15) = 1.60, p = .23$; Synonym Test, Comparison Group: $F(3, 14) = 0.91, p = .46$; Sentence Test, Treatment Group: $F(3, 15) = 0.89, p = .47$; Sentence Test, Comparison Group: $F(3, 14) = 0.85, p = .49$)

The assumptions of normality and homogeneity were tested in order to establish the viability of answering research question three and four using a mixed-model ANOVA. In order to test normality for these questions, both a residual value to the synonym variable and a residual value for the sentence variable were used. Skewedness, kurtosis, and the Shapiro-Wilk test were used to determine normality. Results indicated that there was sufficient evidence to state that the assumption for normality was satisfied [synonym: skewness (-0.28), kurtosis (-0.25), Shapiro-Wilk test was non-significant: $W(37) = 0.98, p = .61$; sentence: skewness (0.12), kurtosis (0.63), Shapiro-Wilk test was non-significant: $W(37) = 0.98, p = .84$]. With regard to homogeneity, the result of Levene's Test of Equality of Error Variances [synonym: $F(1, 35) = 0.37, p = .55$; sentence: $F(1, 35) = 0.48, p = .49$] provided for adequate verification that the variances of the dependent variables (i.e., sentence and synonym test score gains). Three separate

comparisons were established when jointly analyzing research questions three and four: within-subjects testing, between-subjects testing, and interaction between type of test and intervention group.

Between-subjects testing.

When testing for between-subject effects, differences in score gains were examined by intervention condition irrespective of type of test given. The analysis revealed that there was a statistically significant difference between the overall gains ($F(1, 35) = 0.14, p = .71$). Furthermore, the analysis indicated that there was a negligible effect size indicated by the test type (partial $\eta^2 = .004$). Less than one percent of the variability in difference score could be explained by the intervention condition (treatment or comparison). The average gains made amongst study participants in the treatment group were significantly higher ($M = 7.68, SE = 0.73$) than was seen in the comparison group ($M = 2.25, SE = 0.75$) regardless of testing type (synonym or sentence).

Within-subject testing.

When testing for within-subject effects, differences in score gains were examined regardless of intervention condition (treatment or comparison). The analysis revealed that there was not a statistically significant difference between the score gains made for the synonym test and for the sentence test ($F(1, 35) = 0.14, p = .71$). Additionally, analysis revealed an inconsequential effect size indicated by the test type (partial $\eta^2 = .004$). Less than one percent of the variability in difference score could be explained by

the type of test taken by the participants. Within-subject effects indicate that the average gains made on the fill-in-the-blank sentence measure were slightly greater ($M = 5.09$, $SE = 0.61$) than those made on the multiple choice synonym measure ($M = 4.84$, $SE = 0.64$) and that this result was consistent across all participants of the VST-LS study regardless of intervention condition (treatment or comparison). Table 5 depicts the results of the Mixed-Model ANOVA and Table 6 depicts the one-way descriptive statistics.

Table 5. Mixed-Model ANOVA Results, Differences in Pre-Post Gains Between Test Type and Intervention (N = 37)

Source	<i>df</i>	<i>F</i>	η^2	<i>p</i>
Between Subjects				
Intervention Group (I)	1	26.71**	.43	< .001
<i>S</i> within-group error	35	(20.44)		
Within Subjects				
Test Type (T)	1	0.14	.004	.71
T x I	1	6.90*	.17	.01
T x <i>S</i> within-group error	35	(8.21)		

Note. Values enclosed in parentheses represent mean square errors. *S* = subjects.

* $p < .05$. ** $p < .01$.

Table 6. One-Way Descriptive Statistics, Differences in Pre-Post Gains Between Test Type and Intervention (N = 37)

Group	<i>M</i>	<i>SE</i>	95% Confidence Interval	
			Lower	Upper
Intervention Group				
Treatment (<i>n</i> = 19)	7.68	0.73	6.20	9.17
Comparison (<i>n</i> = 18)	2.25	0.75	.72	3.78
Test Type				
Synonym	4.84	0.64	3.55	6.13
Sentence	5.09	0.61	3.86	6.33

Interaction between type of test and intervention group.

An interaction effect was examined to determine if there was variation in gain differences between synonym and sentence measure between the treatment and comparison intervention conditions. Analysis of data reveal that there was a statistically significant difference present ($F(1, 35) = 6.90, p = .01$). Additionally, there was a large effect size indicated by this interaction (partial $\eta^2 = .17$). Seventeen percent of the variability in difference score could be explained by the interaction effect between group and test type. Means indicate that while students in the treatment group made

consistently greater gains than students in the comparison group, there were some discrepancies on which test students made greater gains.

Individual post-hoc paired *t*-tests were run within the treatment group and within the comparison group in order to determine whether or not these differences in gains were significant within each intervention group. Within the treatment group, study participants demonstrated greater gains on the sentence measure ($M = 8.68$, $SE = 0.85$) versus the synonym measure ($M = 6.68$, $SE = 0.89$). The dependent post-hoc *t*-test, $t(18) = -2.04$, $p = .06$, did not indicate that this difference was significant. Within the comparison group, participants demonstrated greater gains on the synonym measure ($M = 3.00$, $SE = 0.91$) versus the sentence measure ($M = 1.50$, $SE = 0.87$). The dependent post-hoc *t*-test, $t(17) = 1.67$, $p = .11$, indicated that this difference was non-significant.

Table 7. Interaction Descriptive Statistics, Differences in Pre-Post Gains Between Test Type and Intervention (N = 37)

Group	Test Type	<i>M</i>	<i>SE</i>	95% Conf Interval	
				Lower	Upper
Treatment ($n = 19$)	Synonym	6.68	0.89	4.88	8.49
	Sentence	8.68	0.85	6.96	10.41
Comparison ($n = 18$)	Synonym	3.00	0.91	1.15	4.85
	Sentence	1.50	0.87	-0.27	3.27

Summary

A one-way analysis of covariance (ANCOVA) test was deemed an appropriate means of answering research question one and two. The ANCOVA testing indicated that there was a statistically significant difference in post-test scores for both the synonym measure, $F(1, 35) = 14.76, p < .001$, and the sentence measure, $F(1, 34) = 43.66, p < .001$, between the treatment condition and the comparison condition, when controlling for pre-test scores on both the synonym measure and the sentence measure. A large effect size was demonstrated, indicated by group, in regard to both the synonym measure, partial $\eta^2 = .30$, and the sentence measure, partial $\eta^2 = .56$. On average, participants in the treatment condition scored higher on both the synonym measure ($M = 24.33, SE = 0.77$) and the sentence measure ($M = 26.24, SE = 0.76$) than did the study participants in the comparison condition (synonym measure: $M = 20.14, SE = 0.77$; sentence measure: $M = 19.03, SE = 0.78$).

A mixed-model analysis of variance (mixed-model ANOVA) was deemed an appropriate means of testing research question three and research question four. The mixed-model ANOVA testing indicated that there was not a statistical significance between the gains made for the synonym measure and for the sentence measure when the within-subject effect was examined, $F(1,35) = 0.14, p = .71$. Additionally, there was an insignificant effect size indicated by measure type, partial $\eta^2 = .004$. All study participants demonstrated slightly higher gains on the sentence measure than the synonym measure, but the difference was not significant. The mixed-model ANOVA testing indicated that there was a statistically significant difference between overall gains

when examining between-subject effects, $F(1,35) = 0.14, p = .71$. However, the effect size was not significant, partial $\eta^2 = .004$. When considering the gains achieved by all of the study participants regardless of intervention condition, participants in the treatment condition demonstrated significantly higher gains ($M = 7.68, SE = 0.73$) than did the participants in the comparison condition ($M = 2.25, SE = 0.75$).

Finally, the mixed-model ANOVA determined that there was a statistically significant difference when testing for an interaction effect, $F(1,35) = 6/90, p = .01$. And, the analysis demonstrated that there was a large effect size, partial $\eta^2 = .17$, indicated by this interaction. However, while participants within the treatment condition demonstrated greater gains on the sentence test versus the synonym test, a dependent post-hoc t test, $t(17) = 1.67, p = .11$, did not indicate that this difference was significant. Additionally, while within the comparison group, the participants demonstrated greater gains on the synonym measure versus the sentence measure, the dependent post-hoc t -test, $t(18) = -2.04, p = .06$, did not indicate that this difference was significant.

CHAPTER FIVE: DISCUSSION

This chapter will discuss the clinical implications of VST-LS with study limitations taken into account. Additionally, this chapter will include suggestions for the direction of future VST-LS research.

Implications

Vocabulary knowledge has been linked to reading comprehension since the early part of the 1900's (Davis, 1944). Recently, the United States government has reiterated the important link between vocabulary and reading comprehension by naming vocabulary as a “foundational pillar” of reading acquisition (NCLBA, 2002). Renewed interest in development of efficacious methods of vocabulary instruction to replace the traditional definitional approach has generated a growing body of research-based knowledge (Beck et. al., 2002; Biancarosa & Snow, 2004; Stahl & Fairbanks, 1986). Research has determined that vocabulary instruction must include definitional information, contextual information, and multiple encounters with the target words (Baumann, 2009; Beck et. al., 2002; Stahl & Fairbanks, 1986). Additionally, research has determined that vocabulary instruction should be direct and explicit which allows for interactive exchanges between the teacher and the students (Baumann, 2009).

From the results of this pilot study, several clinical implications can be derived. First, although it was not possible for the study to be randomized due to the fact that the students were already assigned to their classrooms and one of the teachers had already

participated in a previous VST study, the VST-LS pilot study adds to the body of knowledge in regard to direct and explicit vocabulary instruction that satisfies the research-based guidelines (i.e., definitional information, contextual information, and multiple encounters). The vocabulary gains seen in the treatment group after receiving VST-LS instruction are reflective of gains seen in other studies investigating treatment effects of direct vocabulary instruction (Coyne et. al., 2010; Simmons et. al., 2010, Coyne et. al., 2007). However, while the vocabulary gains seen among students in the treatment condition are encouraging, it must be noted that due to time constraints, it was not possible for the researcher to examine the longevity of the treatment gains by administering both measures several months after the conclusion of the study. Additionally, the large effect sizes (i.e., degree of practical significance) reported for this study must be viewed with caution due to the fact that partial-eta squared can be inflated with relatively small sample sizes.

A second implication of the study was that the current findings indicate that the VST-LS protocol, which can be used to teach students eight new vocabulary words per week, has potential to be an efficacious vocabulary instruction tool for teachers to use in the general education classroom. This is an exciting result in light of the research which has determined that vocabulary acquisition is essential for reading comprehension and academic success (Beck et. al., 2002; Davis, 1944). For many children entering the fourth grade, incidental learning of vocabulary through reading is unlikely (Chall & Jacobs, 2003, Stanovich, 1986), which makes direct vocabulary instruction a necessity if these students are going to compete academically. Regardless of the evidence that

vocabulary instruction is intrinsic to the academic success of many school-aged children, vocabulary instruction is not regularly conducted by teachers in general education classrooms (Berne & Blachowicz, 2009).

Teachers cite two main reasons as to why they don't directly teach vocabulary: curriculum time constraints and not having a specific method to replace the traditional definitional approach (Berne & Blachowicz, 2009). The VST-LS protocol responds to each of these concerns. In regard to the issue of time constraints, vocabulary instruction using the VST-LS protocol is designed to be "time efficient" for teachers in the general education classroom. The researcher provided vocabulary instruction three times a week for thirty minutes (1.5 hours a week) during a time that was typically designated for language arts activities such as independent reading. Teachers could easily use the VST-LS protocol during that time to promote vocabulary gains in their students. Not only would teachers be providing critical vocabulary instruction to students who are at-risk for reading failure, they would also be promoting vocabulary growth for the entire class.

In regard to the issue of a specific method of vocabulary instruction, the VST-LS protocol was designed to be an effective tool for teachers to use that would replace the traditional definitional approach. The result of the data analyses confirmed that the VST-LS protocol is effective in promoting vocabulary gains among 4th grade students. However, what the data analyses cannot provide is information regarding the functionality of the VST-LS protocol in the classroom setting. Not only has the VST-LS protocol showed promise as an effective vocabulary instructional tool for use by teachers in the general education classroom, it has showed promise as a dynamic approach that

encourages students to become enthusiastic about learning vocabulary. Many of the students who received vocabulary instruction with the VST-LS protocol were consistently eager to participate in all of the activities during the four week study. The students enjoyed creating their “portable word walls” and were excited to find out which new color of index card they would be receiving on the first day of the following week.

In fact, the students’ enthusiasm to participate in the VST-LS vocabulary instruction activities made it difficult for the researcher to hold the “encounter dosage” to only 14 encounters per word. Students were consistently excited to share the sentences they created for each of the thirty-two targeted words with the researcher and fellow classmates. While this enthusiasm to participate posed a challenge for the researcher who was specifically examining intensity levels for the VST-LS protocol, a teacher would not be obligated to specific encounter constraints which would allow her to use the enthusiasm generated by the VST-LS protocol to her advantage.

In particular, the students in the treatment condition enjoyed earning “punches” on their “portable word walls” when they demonstrated the ability to use one of the week’s vocabulary words in an original sentence. The researcher acquired several different novelty hole-punchers (e.g., heart, star, bone) and the students were excited to earn a “punch” of their choice. Many students attempted to earn more than one “punch”, but due to the fact that the researcher had to be mindful of limiting word encounters, each student was allowed to earn one “punch” per week. Again, a teacher in the general education classroom would not have this constraint and would be able to use the students’

desire to earn “punches” as a means of bolstering vocabulary learning and vocabulary interest among 4th graders.

A third implication which can be derived from this pilot study relates to intensity (i.e., dosage) of instruction. First, this study added to the knowledge-base regarding vocabulary treatment intensity, which is an important aspect of vocabulary research (Baumann, 2009; Beck & McKeown, 2007; Warren et. al., 2007). Second, the result of this study indicated that a VST protocol which reduced word encounters from 24 encounters to 14 encounters (i.e., VST-LS) provided enough intensity to generate vocabulary knowledge gains on both the synonym and sentence measures. Additionally, the results of this study indicated that it was possible to increase the words taught per week to eight without compromising the effectiveness of VST in promoting vocabulary knowledge gains of 4th grade students in the general education classroom. The results garnered from the VST-LS protocol study demonstrated that it is possible to provide dynamic vocabulary instruction in the general education classroom which is research-based, time efficient, effective, and enjoyable for both the teacher and the students.

A fourth implication of this study is related to the components of effective vocabulary instruction. The data analyses of research question three and four indicated that while instruction provided with the VST-LS protocol, and Typical Instruction provided by a 4th grade teacher, demonstrated gains that were equally distributed between the synonym and sentence measures, VST-LS promoted greater vocabulary gains across the board. It was interesting to the researcher that while the Typical Instruction delivered by the 4th grade teacher contained several components that research has determined are

necessary for effective vocabulary instruction (e.g., definitional information, synonym information, morphological information, and interaction with the words), the VST-LS protocol outperformed Typical Instruction on both the synonym and the sentence measures.

This result further solidifies the significance of studies, such as the current study, which strive to develop evidence-based vocabulary instruction protocols that teachers can readily use in the general education classroom. It cannot be assumed that the inclusion of research-based components into vocabulary instruction will automatically produce the most effective results. The VST-LS protocol also included the research-based components of effective vocabulary instruction, but was designed to provide a specified type and number of encounters for each of the thirty-two words. The students who received vocabulary instruction with the VST-LS protocol were afforded approximately 14-15 specific “language sensitive” listening, reading, writing, and speaking word encounter opportunities with each targeted word. It can be concluded that “how” the components of vocabulary instruction are delivered, as well as the “intensity level” of word encounters, are fundamentally important to the efficacy of any vocabulary instruction method (Beck & McKeown, 1983; Coyne et. al., 2007).

Future Research

While the result of VST-LS protocol demonstrated positive gains in the vocabulary knowledge of 4th grade students within a general education classroom, the protocol must be further vetted through future research. First, future research of the

VST-LS protocol should include a measure specifically designed to analyze gains in passage reading comprehension. Bolstering reading comprehension among students is the ultimate goal of vocabulary instruction, and therefore, the VST-LS protocol must be examined through that lens. Secondly, future research of the VST-LS protocol should increase words taught to 10 words per week with 14 encounters for each word, in order to make the protocol more efficient for use by teachers in the general education classroom.

Thirdly, future research of the VST-LS should include random assignment for participants (if possible), as well as treatment conditions. Fourthly, future VST-LS research should include eta squared statistical information due to the fact that provides a more conservative result when interpreting results particularly with small samples. Finally, future research should examine the efficacy of the VST-LS protocol with students who are at-risk for reading failure due to SES status (e.g., students in Title 1 schools). Students at-risk for reading failure due to low SES are particularly vulnerable in the area of vocabulary and vocabulary instruction, in particular, could increase their level of academic success (Chall & Jacobs, 2003).

APPENDIX A: VST-LS DATA COLLECTION FORM

VST-LS Study Data Collection Form

Name: _____ Class: _____

ID Number: _____

DOB: _____ Gender: Male Female

Special Education Placement(s): _____

Speech-Language Services: _____

Language-Related IEP Goals:

IQ Scores (If Available): _____

ESL Status: _____

FCAT Reading Score (3rd Grade): _____

Days Absent During Treatment Period: _____

Total Hours of Treatment: _____

Vocabulary Test 1 (Pre) Date: _____ Score: _____

Vocabulary Test 2 (Pre) Date: _____ Score: _____

Vocabulary Test 1 (Post) Date: _____ Score: _____

Vocabulary Test 2 (Post) Date: _____ Score: _____

Notes:

APPENDIX B: SYNONYM PRE-TEST

Name: _____

Directions: A *Synonym* is a word that has almost the same meaning as another word. Read each underlined word and circle a word that has the same meaning.

Example: moist

- a. dry
- b. spongy
- c. parched
- d. damp

1.) particular

- a. relaxed
- b. picky
- c. general
- d. steady

2.) reproduced

- a. originated
- b. matched
- c. saved
- d. duplicated

3.) particle

- a. piece
- b. board
- c. gram
- d. weight

4.) environment

- a. house
- b. surrounding
- c. climate
- d. earth

5.) vary

- a. change
- b. conform
- c. make similar
- d. correspond

6.) predator

- a. victim
- b. killer
- c. prey
- d. defender

7.) symmetric

- a. balanced
- b. uneven
- c. synonym
- d. reliable

8.) classify

- a. organize
- b. mark
- c. separate
- d. categorize

9.) specialized

- a. practiced
- b. expanded
- c. focused
- d. wandered

10.) absorb

- a. disperse
- b. gather
- c. soak up
- d. drink

11.) staggered

- a. together
- b. finalized
- c. spread out
- d. out fast

12.) anchor

- a. fasten
- b. release
- c. snag
- d. undo

1T Pre

- | | |
|--|---|
| 13.) <u>constant</u>
a. steady
b. irregular
c. sporadic
d. similar | 20.) <u>enriched</u>
a. enhanced
b. bored
c. won
d. decreased |
| 14.) <u>complex</u>
a. simple
b. complicated
c. evident
d. finalize | 21.) <u>charred</u>
a. undercooked
b. burnt
c. cooked
d. grown |
| 15.) <u>diagram</u>
a. symbol
b. figure
c. line
d. example | 22.) <u>curious</u>
a. energetic
b. indifferent
c. interested
d. confused |
| 16.) <u>decay</u>
a. rot
b. produce
c. lose
d. evaporate | 23.) <u>sequence</u>
a. mix up
b. disarray
c. series
d. connection |
| 17.) <u>necessities</u>
a. requirements
b. desires
c. wishes
d. fluids | 24.) <u>occupied</u>
a. freed
b. engaged
c. opened
d. reserved |
| 18.) <u>gradual</u>
a. abrupt
b. fast
c. steady
d. unbalanced | 25.) <u>unique</u>
a. common
b. foreign
c. ordinary
d. rare |
| 19.) <u>adjust</u>
a. confuse
b. put together
c. continue
d. alter | 26.) <u>industry</u>
a. laziness
b. hard work
c. unemployment
d. vocation |

- 27.) accent
a. mark
b. emphasis
c. blow
d. foreigner
- 28.) exotic
a. common
b. unusual
c. ordinary
d. wealthy
- 29.) qualities
a. personality
b. standards
c. individualism
d. traits
- 30.) destination
a. end
b. start
c. design
d. trip
- 31.) expand
a. contract
b. enlarge
c. create
d. shorten
- 32.) resource
a. product
b. supply
c. deficit
d. reservoir
- 33.) fascinated
a. captivated
b. bored
c. loved
d. blissful

- 34.) official
a. easy
b. authorized
c. proper
d. regulated
- 35.) generation
a. gang
b. age-group
c. destruction
d. relatives
- 36.) migrate
a. stay
b. arrive
c. travel
d. fly

APPENDIX C: SENTENCE PRE-TEST

Name: _____

Sentence Test-T Pre

Directions: Complete the following sentences by choosing the **best** word from the list and writing it in the blank space provided.

Example: I like to _____ ice-cream every day.

Answer: I like to _____ ice-cream every day.

- A. eat
- B. drink
- C. melt
- D. throw

1. Jasmine is _____ about her room always being clean.

2. Kamiko's social studies poster was _____ because she put four items on each side.

3. Panda bears are _____ to the United States.

4. Lisa thought it was _____ that her mother was late picking her up from school.

5. My new puzzle is _____ because it comes with two thousand pieces.

- A. curious
- B. particular
- C. native
- D. pretentious
- E. symmetric
- F. lethargic
- G. spherical
- H. cursory
- I. complex
- J. exotic

6. Marina's silly band is _____ because no one else has it at school.

7. It takes time to complete a big science project because the process is _____.

8. The cool air is _____ when the fan is turned on all day.

9. The teacher only taught math because he _____ in mathematics.

10. Police officers carry _____ badges when they are on duty.

- A. constant
- B. official
- C. specialized
- D. occasional
- E. gradual
- F. conventional
- G. generalized
- H. unique
- I. sudden
- J. filthy

<p>11. Wood will _____ if you do not protect it with paint.</p> <p>12. All the students will _____ to the door when the bell rings.</p> <p>13. Reading books will _____ your knowledge about many subjects.</p> <p>14. Pedro started 4th grade this year and has to _____ to a new teacher.</p>	<p>A. shrivel</p> <p>B. default</p> <p>C. decay</p> <p>D. migrate</p> <p>E. stabilize</p> <p>F. adjust</p> <p>G. abjure</p> <p>H. expand</p>
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<p>15. Students need to _____ as much information from their teacher as they can.</p> <p>16. Keenan will _____ the zoo animals into categories for his science poster.</p> <p>17. The shapes of clouds _____ throughout the day.</p> <p>18. We will use stakes to _____ the tent to the ground.</p>	<p>A. anchor</p> <p>B. weigh</p> <p>C. select</p> <p>D. stagnate</p> <p>E. transfer</p> <p>F. vary</p> <p>G. classify</p> <p>H. absorb</p>
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<p>19. Look at the _____ on the wall to see where the exits are located.</p> <p>20. Doing your homework is one of the _____ of a good student.</p> <p>21. The music _____ is always looking for new musicians.</p> <p>22. The younger _____ have been using computers since they were born.</p>	<p>A. qualities</p> <p>B. faculties</p> <p>C. industry</p> <p>D. diagram</p> <p>E. citizens</p> <p>F. identities</p> <p>G. generation</p> <p>H. template</p>
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2T Pre

23. I _____ the movie so my sister could have a copy.
24. The wood was _____ after it was burned in the fireplace.
25. The kids didn't want to leave the mall because they were _____ with the new 3-D video game.
26. Rasheen _____ the smoothie with protein.
27. My mom _____ my dance classes so I would not get too tired.

- A. staggered
- B. annexed
- C. fascinated
- D. charred
- E. worsened
- F. reproduced
- G. ripped
- H. branded
- I. enriched
- J. provoked

28. My friend speaks English with a cool _____ because she is from Russia.
29. Many plants need a shady _____ in order to grow.
30. My brother is a helpful _____ because he knows a lot about video games.
31. The _____ is a type of animal that will hunt for food.
32. Oliver had to use a magnifying glass to see the _____ on his computer screen.

- A. abacus
- B. speech
- C. resource
- D. predator
- E. accent
- F. recourse
- G. soil
- H. environment
- I. particle
- J. palisade

APPENDIX D: SYNONYM POST-TEST

Name: _____

Directions: A *Synonym* is a word that has almost the same meaning as another word. Read each underlined word and circle a word that has the same meaning.

Example: moist

- a. dry
- b. spongy
- c. parched
- d. damp

1.) qualities

- a. standards
- b. personality
- c. traits
- d. individualism

2.) particle

- a. weight
- b. board
- c. gram
- d. piece

3.) environment

- a. house
- b. earth
- c. climate
- d. surrounding

4.) constant

- a. steady
- b. sporadic
- c. irregular
- d. similar

5.) vary

- a. correspond
- b. conform
- c. change
- d. make similar

6.) complex

- a. finalize
- b. simple
- c. evident
- d. complicated

7.) predator

- a. killer
- b. victim
- c. defender
- d. prey

8.) classify

- a. organize
- b. categorize
- c. mark
- d. separate

9.) absorb

- a. soak up
- b. gather
- c. disperse
- d. drink

10.) staggered

- a. out fast
- b. together
- c. spread out
- d. finalized

11.) diagram

- a. figure
- b. symbol
- c. example
- d. line

12.) decay

- a. evaporate
- b. lose
- c. produce
- d. rot

1C Post

- | | |
|-------------------------|-------------------------|
| 13.) <u>fascinated</u> | 20.) <u>official</u> |
| a. blissful | a. regulated |
| b. captivated | b. proper |
| c. bored | c. authorized |
| d. loved | d. easy |
| 14.) <u>reproduced</u> | 21.) <u>accent</u> |
| a. originated | a. mark |
| b. duplicated | b. blow |
| c. saved | c. foreigner |
| d. matched | d. emphasis |
| 15.) <u>necessities</u> | 22.) <u>destination</u> |
| a. fluids | a. trip |
| b. wishes | b. start |
| c. desires | c. design |
| d. requirements | d. end |
| 16.) <u>enriched</u> | 23.) <u>curious</u> |
| a. won | a. confused |
| b. enhanced | b. interested |
| c. bored | c. indifferent |
| d. decreased | d. energetic |
| 17.) <u>sequence</u> | 24.) <u>expand</u> |
| a. disarray | a. create |
| b. mix up | b. shorten |
| c. connection | c. contract |
| d. series | d. enlarge |
| 18.) <u>unique</u> | 25.) <u>exotic</u> |
| a. rare | a. ordinary |
| b. foreign | b. unusual |
| c. ordinary | c. wealthy |
| d. common | d. common |
| 19.) <u>industry</u> | 26.) <u>resource</u> |
| a. unemployment | a. supply |
| b. hard work | b. deficit |
| c. laziness | c. reservoir |
| d. vocation | d. product |

2C Post

27.) generation
a. age-group
b. gang
c. destruction
d. relatives

28.) occupied
a. opened
b. engaged
c. freed
d. reserved

29.) migrate
a. travel
b. fly
c. arrive
d. stay

30.) particular
a. relaxed
b. steady
c. general
d. picky

31.) specialized
a. expanded
b. wandered
c. practiced
d. focused

32.) anchor
a. snag
b. undo
c. fasten
d. release

33.) symmetric
a. synonym
b. uneven
c. reliable
d. balanced

34.) gradual
a. fast
b. abrupt
c. unbalanced
d. steady

35.) adjust
a. alter
b. put together
c. continue
d. confuse

36.) charred
a. grown
b. cooked
c. burnt
d. undercooked

3C Post

APPENDIX E: SENTENCE POST-TEST

Name: _____

Sentence Test-C Post

Directions: Complete the following sentences by choosing the **best** word from the list and writing it in the blank space provided.

Example: I like to _____ ice-cream every day.

Answer: I like to _____ ice-cream every day.

- A. eat
- B. drink
- C. melt
- D. throw

1. Many plants need a shady _____ in order to grow.
2. My brother is a helpful _____ because he knows a lot about video games.
3. Oliver had to use a magnifying glass to see the _____ on his computer screen.
4. My friend speaks English with a cool _____ because she is from Russia.
5. The _____ is a type of animal that will hunt for food.

- A. speech
- B. soil
- C. predator
- D. abacus
- E. accent
- F. environment
- G. palisade
- H. particle
- I. resource
- J. recourse

6. Kamiko's social studies poster was _____ because she put four items on each side.
7. Jasmine is _____ about her room always being clean.
8. Lisa thought it was _____ that her mother was late picking her up from school.
9. My new puzzle is _____ because it comes with two thousand pieces.
10. Panda bears are _____ to the United States.

- A. exotic
- B. particular
- C. symmetric
- D. native
- E. spherical
- F. pretentious
- G. complex
- H. lethargic
- I. cursory
- J. curious

11. The kids didn't want to leave the mall because they were _____ with the new 3-D video game.
12. Rasheen _____ the smoothie with protein.
13. My mom _____ my dance classes so I would not get too tired.
14. The wood was _____ after it was burned in the fireplace.
15. I _____ the movie so my sister could have a copy.

- A. annexed
- B. staggered
- C. charred
- D. reproduced
- E. ripped
- F. branded
- G. fascinated
- H. enriched
- I. provoked
- J. worsened

16. The cool air is _____ when the fan is turned on all day.
17. It takes time to complete a big science project because the process is _____.
18. The teacher only taught math because he _____ in mathematics.
19. Police officers carry _____ badges when they are on duty.
20. Marina's silly band is _____ because no one else has it at school.

- A. official
- B. specialized
- C. constant
- D. occasional
- E. generalized
- F. unique
- G. sudden
- H. gradual
- I. filthy
- J. conventional

<p>21. Keenan will _____ the zoo animals into categories for his science poster.</p> <p>22. We will use stakes to _____ the tent to the ground.</p> <p>23. The shapes of clouds _____ throughout the day.</p> <p>24. Students need to _____ as much information from their teacher as they can.</p>	<p>A. weigh</p> <p>B. transfer</p> <p>C. anchor</p> <p>D. stagnate</p> <p>E. select</p> <p>F. absorb</p> <p>G. classify</p> <p>H. vary</p>
<p>25. Reading books will _____ your knowledge about many subjects.</p> <p>26. All the students will _____ to the door when the bell rings.</p> <p>27. Pedro started 4th grade this year and has to _____ to a new teacher.</p> <p>28. Wood will _____ if you do not protect it with paint.</p>	<p>A. shrivel</p> <p>B. migrate</p> <p>C. decay</p> <p>D. stabilize</p> <p>E. adjust</p> <p>F. expand</p> <p>G. abjure</p> <p>H. default</p>
<p>29. Look at the _____ on the wall to see where the exits are located.</p> <p>30. The younger _____ have been using computers since they were born.</p> <p>31. The music _____ is always looking for new musicians.</p> <p>32. Doing your homework is one of the _____ of a good student.</p>	<p>A. industry</p> <p>B. diagram</p> <p>C. faculties</p> <p>D. citizens</p> <p>E. identities</p> <p>F. generation</p> <p>G. qualities</p> <p>H. template</p>

3C - Post

APPENDIX F: VST-LS PROTOCOL

<p style="text-align: center;">Intervention Day 1 (30 minutes) TEACH NEW VOCABULARY WITH THE VOCABULARY SCENARIO TECHNIQUE <i>Outcome: Students participate in the technique; create a word card with the new word and a sentence.</i> <i>Note: E=encounter</i></p>			
Materials	Cue	Do	Review
<p>Visual displays of __vocabulary scenarios</p> <p>Index Cards with plain holes already punched</p> <p>Rings</p>	<p>Tell students you have a way to help them understand more words when they are reading. Reading better will help them get better grades and do better on important tests.</p> <p>Say that you expect them to participate actively by watching carefully what you will demonstrate and by answering questions when you ask them.</p> <p>They will also be developing their own portable word wall on index cards</p>	<p>Distribute _____ index cards before beginning. Tell students not to touch them until you say so.</p> <ol style="list-style-type: none"> 1. Display the visual of the vocabulary scenario on the screen. Read the scenario out loud (E1). Highlight the word. Ask the students to predict the meaning of the highlighted word. 2. Assist the students, as needed, to identify the correct meaning of the word from the scenario.(Specify the specific use of the word in this context. You might mention that the word also has other meanings when that is the case but you are not going to go into that now.) 3. Ask the students to think of other words that mean the same thing as _____(the word) (E2). Write the target word and the synonyms on the screen; e.g. Investigate = find out; check out; look into. 4. On the vocabulary scenario visual, replace the target word with the best the synonym the students generated. 5. Have students read chorally the scenario (E3); then have them read it with the synonym. 6. Have them write the word on the front of their 'portable word wall' (E4) [and ask them to think about how they would use the word in a sentence (E5). 7. Elicit two sentences from students (E6, E7). Write the best sentence on the screen. 8. Have students copy the sentence on the back of their 'portable word wall'. (E8). *REPEAT FOR EACH WORD 	<p>"We learned 4 new words today. What were they?"</p> <p>For each word: "What does _____mean? (Call on a student) (E9)</p> <p>All together what does _____mean?" (E10)</p> <p>Tell them where to keep their index cards and that they will be adding to their pack.</p> <p>(Have the teacher distribute the rings for the cards and show students how to put their cards on them)- not part of the 30 minutes.</p>

<p style="text-align: center;">Intervention Day 2 (30 minutes) TEACH NEW VOCABULARY WITH THE VOCABULARY SCENARIO TECHNIQUE <i>Outcome: Students participate in the technique; create a word card with the new word and a sentence.</i> <i>Note: E=encounter</i></p>			
Materials	Cue	Do	Review
<p>Visual displays of __vocabulary scenarios</p> <p>Index Cards with plain holes already punched</p> <p>Rings</p>	<p>Tell students you have a way to help them understand more words when they are reading. Reading better will help them get better grades and do better on important tests.</p> <p>Say that you expect them to participate actively by watching carefully what you will demonstrate and by answering questions when you ask them.</p> <p>They will also be developing their own portable word wall on index cards</p>	<p>Distribute _____ index cards before beginning. Tell students not to touch them until you say so.</p> <ol style="list-style-type: none"> 1. Display the visual of the vocabulary scenario on the screen. Read the scenario out loud (E1). Highlight the word. Ask the students to predict the meaning of the highlighted word. 2. Assist the students, as needed, to identify the correct meaning of the word from the scenario.(Specify the specific use of the word in this context. You might mention that the word also has other meanings when that is the case but you are not going to go into that now.) 3. Ask the students to think of other words that mean the same thing as _____(the word) (E2). Write the target word and the synonyms on the screen; e.g. Investigate = find out; check out; look into. 4. On the vocabulary scenario visual, replace the target word with the best the synonym the students generated. 5. Have students read chorally the scenario (E3); then have them read it with the synonym. 6. Have them write the word on the front of their 'portable word wall' (E4) [and ask them to think about how they would use the word in a sentence (E5). 7. Elicit two sentences from students (E6, E7). Write the best sentence on the screen. 8. Have students copy the sentence on the back of their 'portable word wall'. (E8). <p style="text-align: center;">*REPEAT FOR EACH WORD</p>	<p>"We learned 4 new words today. What were they?"</p> <p>For each word: "What does _____mean? (Call on a student) (E9)</p> <p>All together what does _____mean?" (E10)</p> <p>Tell them where to keep their index cards and that they will be adding to their pack.</p> <p>(Have the teacher distribute the rings for the cards and show students how to put their cards on them)- not part of the 30 minutes.</p>

<p>Intervention Day 3 – 30 minutes</p> <p>TEACH NEW VOCABULARY WITH THE VOCABULARY SCENARIO TECHNIQUE</p> <p><i>Outcome: Students participate in the technique; create a word card with the new word and a sentence.</i></p> <p><i>Note: E=encounter</i></p>			
Materials	Cue	Do	Review
Decorative punch	<p>Remind students of the vocabulary activity you have been doing this week.</p> <p>Today they will learn review the new words</p> <p>Say that you expect them to participate actively by doing the activities you ask them to do.</p> <p>They will get a special hole punch in the vocabulary card if they know the word.</p>	<p>Have teacher seat students in pairs before you start.</p> <ol style="list-style-type: none"> 1. Introduce morphological variations for the ‘portable word walls’ (E 11) 2. Have 2 students to generate sentences using the word. (E12, E13) Ask students to listen and judge whether the sentence is used correctly. Discuss why or why not. 3. Have student pairs alternate asking each other to use a word in a sentence. Take turns so that each student does half the words. (E 14) <p>*REPEAT FOR EACH WORD</p>	<p>When students can explain the meaning of a word and use it in a sentence, punch the corresponding index card with a decorative punch (only for teacher use).</p>

APPENDIX G: CORPUS OF WORDS

VST-LS Pilot Study / Final Word List

Week 1

1. particular
2. reproduced
3. particle
4. environment
5. predator
6. vary
7. symmetric
8. classify

Week 2

1. staggered
2. charred
3. decay
4. migrate
5. exotic
6. unique
7. expand
8. official

Week 3

1. resource
2. fascinated
3. qualities
4. accent
5. adjust
6. enriched
7. gradual
8. diagram

Week 4

1. constant
2. complex
3. anchor
4. specialized
5. industry
6. generation
7. absorb
8. curious

APPENDIX H: VST-LS SCENARIOS

VST- LS Pilot Study – Week 1 Scenarios

1. Tiffany went shopping with her mother for a new dress. They went to many stores and saw lots of nice dresses. Tiffany always found something wrong with each dress. Her mother said, “Boy you are so particular!” We will never find a dress to buy.

(reproduce, reproduces, reproducing)
2. Amanda is a great artist. She did a painting in art class that was really good. Her mother wanted to frame it but so did her grandmother. Amanda reproduced the painting so that her mother and grandmother could each have one.

(particles)
3. Jack worked hard on his science project. Just as he was finished writing the title on the poster board a particle of dirt smudged the letters. He couldn’t believe that happened! The poster wasn’t ruined but it didn’t look great.

(particles)
4. Chris has a very neat and clean room. He always puts away his clothes and keeps his things where they belong. He enjoys a nice environment. He doesn’t want to live in a mess.

(environments)
5. Mr. Brown, the fourth grade teacher, surprised the class by changing the Friday schedule. He wanted to vary activities. He didn’t want students to do the same things all the time.

(varies, varied, varying)
6. Scott loves video games. However, his parents do not allow him to buy games where he pretends to be a predator. They don’t like violence.

(predators)
7. The Butler Family lost many plants this winter due to cold weather. In spring Jesse helped his dad plant new bushes. They planted the same bushes on both sides of the house so that they would have a symmetric design.

(symmetrical as an alternative to symmetric)
8. Rodney loves to skateboard. He also has many other interests. We wouldn’t classify him as a skater. He doesn’t really belong to that group.

(classifies, classifying, classified)

VST-LS Pilot Study – Week 2 Scenarios

1. Fourth graders don't like to take the FCAT! At least the tests are staggered so that students don't have to take them all in one day. It helps to have the tests spread over the week.

(stagger, staggers, staggering)
2. Brad's parents have told him not to play with matches. One day he didn't listen. He burned some papers he didn't need on top of his desk at home. The fire charred the desk. Boy, was his mother angry that his white desk had a black spot on it!

(char, chars, charring)
3. When the flowers in our garden die they fall over. Pretty soon they decay. They turn brown, then waste away.

(decays, decaying, decayed)
4. In the winter flocks of birds migrate to Florida. They fly south for the warm weather. We see them flying over our house when it starts to get cold up north.

(migrates, migrating, migrated)
5. My friend wanted his parents to buy an exotic pet for his birthday. He didn't want a normal animal like dog or a cat. He wanted a monkey.
6. My dad works with wood as a hobby. He made me a unique gift. He made a pen like I have never seen. It was very different.
7. I packed a small bag for our family trip. It's a good thing it will expand. I want to buy things in the cities we visit. The bag will need to get bigger.

(expands, expanding, expanded)
8. Our principal told Amanda that she won the art contest. Amanda didn't get the official letter yet but she knew she was the winner. Soon she'll get a letter from the people in charge of the contest.

VST-LS Pilot Study – Week 3 Scenarios

1. The rules for the science fair are that boys and girls have to do their own work. They can use adults as a resource. Moms and dads can answer questions and help but they can't do the project for the students.

(resources)

2. Jenny got a chance to ride in a hot air balloon. The pilot fascinated Jenny with her moves to fly it. got the balloon to go where she wanted. Jenny watched every action carefully.

(fascinate, fascinates, fascinating)

3. Jack has developed many good qualities as a boy scout. He is loyal, truthful and kind. These are the things people like about Jack.

(quality)

4. Sam's grandmother is from Germany. She has an accent that is different from what we are used to hearing. Her way of speaking English has a touch of German to it.

(accents)

5. Stacey has a new baby brother. She loves him but it is hard getting used to having a little one in the house. She is trying to adjust. She now has to share her parents with the baby. It will take time to get used to the change.

(adjusts, adjusting, adjusted)

6. Zach's mother buys him cereal that is enriched with vitamins. He gets a lot of vitamins this way. His cereal has good things added to it.

(enrich, enriching, enriches)

7. Rinaldo started to play baseball this year. He won't become a baseball star overnight. His progress will be gradual. If he keeps up his hard work, he will become a good player.

8. In science we learned about the earth's layers. Our teacher had us draw a diagram to remember the names of the parts. This kind of drawing is helpful in studying.

(diagrams)

VST-LS Pilot Study – Week 4 Scenarios

1. I have a new puppy that cries all night. The sound is constant. She never stops crying!
2. Our teacher showed us how to do long division problems. Oh boy, are they complex! There are many steps and it is easy to get lost. They are the hardest math problems we have seen.
3. Paul Moore went fishing with his dad. Mr. Moore drove the boat out to a spot in the lake where fish hang out. He wanted to anchor the boat where they would catch the most fish. They picked this spot to stop the boat and keep it in one place.

(anchors, anchoring, anchored) or (anchor/anchors as nouns)

4. Jamie's grandmother was a doctor. She is not working now. Years ago she specialized in babies. She was known for working with very young children.

(specialize, specializes, specializing)

5. Melissa's grandfather worked in the car industry. He worked thirty years for a company that made sports cars. He liked making cars.

(industries)

6. Many kids today have cell phones. Their grandparents may not have had them when they were young. The older generation may still not have cell phones. Some of this group of people may not even want them.

(generations)

7. My cat knocked over the milk that was on the kitchen counter. My mom grabbed a lot of paper towels to absorb the milk. It was a good thing that the towels soaked up the milk, or we would have had a mess.

(absorbs, absorbing, absorbed)

8. My cat knocked over the milk because he was curious about the bag that was sitting on the counter. He really wanted to know what was in that bag. The milk just got in the way.

APPENDIX I: VST-LS FIDELITY CHECKLISTS

Fidelity Check VST –LS Day 1		Date:	Observer:
Feature	Yes	No	Comments
Cue provided including:			
• bridge from previous lesson			
• orientation to today's lesson			
• expectations regarding performance			
Lesson includes 10 encounters for Word 1			
E1 T reads scenario aloud to the class			
E2 S offers synonym			Additional Es:
E3 All read scenario and reread with synonym			
E4 All write the word on the front of their cards			
E5 T ask S to think about using word in a sentence			
E6 E7 T elicits 2 sentences from students			
E8 All copy sentence on cards			
Lesson includes 10 encounters for Word 2			
E1 T reads scenario aloud to the class			
E2 S offers synonym			Additional Es:
E3 All read scenario and reread with synonym			
E4 All write the word on the front of their cards			
E5 T ask S to think about using word in a sentence			
E6 E7 T elicits 2 sentences from students			
E8 All copy sentence on cards			
Lesson includes 10 encounters for Word 3			
E1 T reads scenario aloud to the class			
E2 S offers synonym			Additional Es:
E3 All read scenario and reread with synonym			
E4 All write the word on the front of their cards			
E5 T ask S to think about using word in a sentence			
E6 E7 T elicits 2 sentences from students			
E8 All copy sentence on cards			
Stdents complete word card:			
• front of card			
• back with scenario			
Visual display used for scenarios			
Review provided, including:			
• E 9 T asks "who can tell me what _____ means in their own words?" (for all 3)			
• E 10 T says to S "all together, what does _____ mean?" (for all 3)			
• Orientation to next VST lesson			
Lesson is 30 minutes			

Fidelity Check VST-LS Day 2		Date:	Observer:
Feature	Yes	No	Comments
Cue provided including:			
• bridge from previous lesson			
• orientation to today's lesson			
• expectations regarding performance			
Lesson includes 10 encounters for Word 1			
E1 T reads scenario aloud to the class			
E2 S offers synonym			Additional Es:
E3 All read scenario and reread with synonym			
E4 All write the word on the front of their cards			
E5 T ask S to think about using word in a sentence			
E6 E7 T elicits 2 sentences from students			
E8 All copy sentence on cards			
Lesson includes 10 encounters for Word 2			
E1 T reads scenario aloud to the class			
E2 S offers synonym			Additional Es:
E3 All read scenario and reread with synonym			
E4 All write the word on the front of their cards			
E5 T ask S to think about using word in a sentence			
E6 E7 T elicits 2 sentences from students			
E8 All copy sentence on cards			
Lesson includes 10 encounters for Word 3			
E1 T reads scenario aloud to the class			
E2 S offers synonym			Additional Es:
E3 All read scenario and reread with synonym			
E4 All write the word on the front of their cards			
E5 T ask S to think about using word in a sentence			
E6 E7 T elicits 2 sentences from students			
E8 All copy sentence on cards			
Students complete word card:			
• front of card			
• back with scenario			
Visual display used for scenarios			
Review provided, including:			
• E 9 T asks "who can tell me what _____ means in their own words?" (for all 3)			
• E 10 T says to S "all together, what does _____ mean?" (for all 3)			
• Orientation to next VST lesson			
Lesson is 30 minutes			

Fidelity Check VST -Day 3		Date:	Observer:	
Feature	Yes	No	Comments	
Cue provided including:				
• bridge from previous lesson				
• orientation to today's lesson as a review				
• expectations regarding performance				
Lesson includes 4 encounters for Word 1				
E11 T introduces morphological variations.				
E12, E13 S generate 2 sentences; All judge correct use.				
Lesson includes 4 encounters for Word 2				
E11 T introduces morphological variations.				
E12, E13 S generate 2 sentences; All judge correct use.				
Lesson includes 4 encounters for Word 3				
E11 T introduces morphological variations.				
E12, E13 S generate 2 sentences; All judge correct use.				
Review provided, including:				
• E14 S pairs ask each other for use in sentence				
• Orientation to next VST lesson				
• Hole punch known cards of known words				
Lesson is 30 minutes				

APPENDIX J: INSTRUCTION VERIFICATION CHECKLIST

Instruction Verification Checklist

Week # _____ **Day #** _____ **Date** _____

Step 1 _____ Define the word by looking it up in the dictionary or a text book.

Step 2 _____ Once the word is defined, the students will determine if there are any prefixes or suffixes that can aid them in understanding the meaning of the word.

Step 3 _____ The students will be asked to use the word in a meaningful sentence and discuss how the word was used in the sentence.

Step 4 _____ The students will "act out" the word (if possible).

Step 5 _____ Once the students are familiar with the word, the teacher and students use the word as many times as they can for the rest of the week.

Instruction time: _____

Number of Words Taught: _____

APPENDIX K: IRB APPROVAL LETTER



University of Central Florida Institutional Review Board
Office of Research & Commercialization
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: 407-823-2901 or 407-882-2276
www.research.ucf.edu/compliance/irb.html

Approval of Exempt Human Research

From: **UCF Institutional Review Board #1**
FWA00000351, IRB00001138

To: **Joanna H. Spielvogel**

Date: **April 01, 2011**

Dear Researcher:

On 4/1/2011, the IRB approved the following activity as human participant research that is exempt from regulation:

Type of Review: Exempt Determination
Project Title: Curriculum Vocabulary Acquisition of 4th Graders using a
Language-Sensitive Teaching Approach.
Investigator: Joanna H. Spielvogel
IRB Number: SBE-11-07569
Funding Agency:
Grant Title:
Research ID: NA

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these changes affect the exempt status of the human research, please contact the IRB. When you have completed your research, please submit a Study Closure request in iRIS so that IRB records will be accurate.

In the conduct of this research, you are responsible to follow the requirements of the Investigator Manual.

On behalf of Kendra Dimond Campbell, MA, JD, UCF IRB Interim Chair, this letter is signed by:

Signature applied by Joanne Muratori on 04/01/2011 09:44:19 AM EST

IRB Coordinator

LIST OF REFERENCES

- Allington, R. L. (1984). Content coverage and contextual reading in reading groups. *Journal of Reading Behavior*, 16, 85-96.
- Apthorp, H. S. (2006). Effects of a supplemental vocabulary program in third-grade reading/language arts. *The Journal of Educational Research*, 100(2), 67-79.
- August, D., Carlo, M., Dressler, C., Snow, C. (2005). The critical role of vocabulary development for English language learners. *Learning Disabilities Research & Practice*, 20(1), 50-57.
- Baumann, J. F. & Graves, M. F. (2010). What is academic vocabulary? *Journal of Adolescent & Adult Literacy*, 54(1), 4-12.
- Baumann, J. F. (2009). Intensity in vocabulary instruction and effects on reading comprehension. *Topics in Language Disorders*, 29(4), 312-328.
- Beck, I. L. & McKeown, M. G. (2007). Increasing young low-income children's oral vocabulary repertoires through rich and focused instruction. *The Elementary School Journal*, 107(3), 251-271.
- Beck, I. L. & McKeown, M. G. (1983). Learning words well: a program to enhance vocabulary and comprehension. *The Reading Teacher*, 36(7), 622-625.
- Beck, I. L., McKeown, M. G., & Kucan, L. (2002). *Bringing words to life: Robust vocabulary instruction*. New York: Guilford Press.
- Beck, I. L., Perfetti, C. A., & McKeown, M. G. (1982). Effects of long-term vocabulary instruction on lexical access and reading comprehension. *Journal of Educational Psychology*, 74(4), 506-521.
- Becker, W. C. (1977). Teaching reading and language to the disadvantaged- What we have learned from field research. *Harvard Educational Review*, 47, 518-543.
- Berne, J. I. & Blachowicz, C. L. Z. (2008). What reading teachers say about vocabulary instruction: voices from the classroom. *The Reading Teacher*, 62(4), 314-323.
- Biancarosa, G. & Snow, C. (2004). Reading next – A vision for action and research in middle and high school reading. A report to the Carnegie Corporation of New York (2nd Ed.). Washington, DC: Alliance for Excellent Education.
- Biemiller, A. (2003) Vocabulary: Needed if more children are to read will. *Reading Psychology*. 24, 323-335.

- Biemiller, A. (2001) Teaching vocabulary: Early, direct, and sequential. *American Educator*, 25(1), 24-28, 47.
- Biemiller, A. & Boote, C. (2006). An effective method for building meaning vocabulary in primary grades. *Journal of Educational Psychology*, 98(1), 44-62.
- Bos, C. S. & Anders, P. L. (1990). Effects of interactive vocabulary instruction on the vocabulary learning and reading comprehension of Junior-High learning disabled students. *Learning Disability Quarterly*, 13(1), 31-42.
- Boulware-Gooden, R., Carreker, S., Thornhill, A., & Joshi, R. M. (2007). Instruction of metacognitive strategies enhances reading comprehension and vocabulary achievement of third-grade students. *The Reading Teacher*, 61(1) 70-77.
- Brabham, E. G. & Villaume, S. K. (2002). Vocabulary instruction: concerns and visions. *The Reading Teacher*, 56(3), 264-268.
- Bromley, K. (2007). Nine things every teacher should know about words and vocabulary instruction. *Journal of Adolescent & Adult Literacy*, 50(7), 528-537.
- Bryant, D. P., Goodwin, M., Bryant, B. R., & Higgins, K. (2003). Vocabulary instruction for students with learning disabilities: a review of the research. *Learning Disabilities Quarterly*, 26, 117-128.
- Chall, J. S., & Jacobs, V. A. (2003, Spring). The classic study on poor children's fourth grade slump. *American Educator*, 14-15, 44.
- Cherry-Cruz, T. (2001, December 26). Enhancing literacy through the techniques of storytelling. *The ASHA Leader*.
- Coyne, M. D., McCoach, D. B., & Kapp, S. (2007). Vocabulary intervention for kindergarten students: comparing extended instruction to embedded instruction and incidental exposure. *Learning Disabilities Quarterly*, 30, 74-88.
- Coyne, M. D., McCoach, D. B., Loftus, S., Zipoli, R., & Kapp, S. (2009). Direct vocabulary instruction in kindergarten: teaching for breadth versus depth. *The Elementary School Journal*, 110(1), 1-18.
- Coyne, M. D., McCoach, D. B., Loftus, S., Zipoli, R., Ruby, M., Crevecoeur, Y. C., & Kapp, S. (2010). Direct and extended vocabulary instruction in kindergarten: investigation transfer effects. *Journal of Research on Educational Effectiveness*, 3, 93-120.
- Cronbach, L. J. (1942). An analysis of techniques for diagnostic vocabulary testing. *Journal of Educational Research*, 36, 206-217.

- Crow, J. T. (1986) Receptive vocabulary acquisition for reading comprehension. *The Modern Language Journal*, 70, 242-250.
- Cunningham, A. E. & Stanovich, K. E. (1997). Early reading acquisition and its relation to reading experience and ability 10 years later. *Developmental Psychology*, 33(6), 934-945.
- Davis, F. B. (1944). Fundamental factors of comprehension in reading. *Psychometrika*, 9(3), 185-197.
- Dougherty-Stahl, K. A. & Bravo, M. A. (2010). Contemporary classroom vocabulary assessment for content areas. *The Reading Teacher*, 63(7), 566-578.
- Duff, F. J, Fieldsend, E., Bowyer-Crane, C., Hulme, C., Smith, G., Gibbs, S., & Snowling, M. J. (2008). Reading with vocabulary intervention: evaluation of an instruction for children with poor response to reading intervention. *Journal of Research in Reading*, 31(3), 319-336.
- Ebbers, S. M. & Denton, C. A. (2008). A root awakening: vocabulary instruction for older students with reading difficulties. *Learning Disabilities Research & Practice*, 23(2), 90-102.
- Ehren, B. J. (2002, April 16) Getting into the adolescent literacy game. *The ASHA Leader*.
- Ehren, B. J. (2008) STRUCTURE You Reading, Winter Springs, FL: Student Success Initiatives.
- Ehren, B. J., Zadroga, C., & Proly, J. L. (2010). Value added by SLPs to vocabulary instruction with older students. ASHA Convention 2010 presentation.
- Fisher, P. J. & Blachowicz, C. L. Z. (2005). Vocabulary instruction in a remedial setting. *Reading & Writing Quarterly*, 21, 281-300.
- Gierut, J. A. (2001). Complexity in phonological treatment: clinical factors. *Language, Speech, and Hearing Services in Schools*, 32, 229-241.
- Greenwood, S. C. (May/June, 2002). Making Words Matter: Vocabulary Study in the Content Areas. *The Clearing House*, 75(5), 258-263.
- Harmon, J. M., Hedrick, W. B., Wood, K. D. (2005). Research on vocabulary instruction in the content areas: implications for struggling readers. *Reading & Writing Quarterly*, 21, 261-280.
- Hirsch, E. D. (Spring, 2003). Reading comprehension requires knowledge – of words and the world. *American Educator*, 10-13, 16-22, 28-29.

- Jitendra, A. K., Edwards, L. L., Sacks, G., Jacobson, L. A. (2004). What research says about vocabulary instruction for students with learning disabilities. *Council for Exceptional Children*, 70(3), 299-322.
- Joshi, R. M. (2005). Vocabulary: a critical component of comprehension. *Reading & Writing Quarterly*, 21, 209-219.
- Justice, L. M. & Pullen, P. C. (2003). Promising interventions for promoting emergent literacy skills: three evidence-based approaches. *TECSE*, 23(3), 99-113.
- Kahmi, A. G. (2003, April 15). The role of the SLP in improving reading fluency. *The ASHA Leader*.
- Kieffer, M. J. & Lesaux, N. K. (2007). Breaking down words to build meaning: morphology, vocabulary, and reading comprehension in the urban classroom. *The Reading Teacher*, 61(2), 134-144.
- Lovelace, S. & Stewart, S. R. (2009). Effects of robust vocabulary instruction and multicultural text on the development of word knowledge among African American children. *American Journal of Speech-Language Pathology*, 18, 168-179.
- Marzano, R. J., & Pickering, D. J. (2005). *Building academic vocabulary: a teacher's manual*. Alexandria, VA: Association for Supervision and Curriculum Development.
- McKeown, M. G., Beck, I. L., Omanson, R. C., & Pople, M. T. (1985). Some effects of the nature and frequency of vocabulary instruction on the knowledge and use of words. *Reading Research Quarterly*, 20(5), 522-535.
- Merton, R. (1986). The Matthew effect in science. *Science*, 56-63.
- Montgomery, J. K. & Hayes, L. L. (2005). Literacy transition strategies for upper elementary students with language disabilities. *Communication Disorders Quarterly*, 26(2), 85-93.
- Nagy, W. E., & Anderson, R. C. (1984). How many words are there in printed school English? *Reading Research Quarterly*, 19, 304-330.
- National Assessment Governing Board (2011). *Reading framework for the 2011 National Assessment of Educational Progress*. Washington, DC: American Institutes for Research.

- National Institute of Child Health and Human Development. (2002). *Report of the National Reading Panel. Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction* (NIH Publication No. 00-4769). Washington, DC: U.S. Government Printing Office.
- Nelson, J. R. & Stage, S. A. (2007). Fostering the development of vocabulary knowledge and reading comprehension through contextually-based multiple meaning vocabulary instruction. *Education and Treatment of Children*, 30(1), 1-22.
- No Child Left Behind Act of 2001, Pub. L. No. 107-110. 115 Stat. 1425 (2002)
- Phillips, D. C. K., Foote, C. J., & Harper, L. J. (2008, Summer). Strategies for effective vocabulary instruction. *Reading Improvement*, 62-68.
- Rand Reading Study Group (2002) *Reading for understand: Toward an R&D program in reading comprehension*. Santa Monica, CA: RAND.
- Read, J. (2000). *Assessing vocabulary*. Cambridge, England: Cambridge University Press.
- Richek, M. A. (2005). Words are wonderful: Interactive, time-efficient strategies to teach meaning vocabulary. *The Reading Teacher*, 58(5), 414-423.
- Rupley, W. H. (2009). Introduction to direct/explicit instruction in reading for the struggling reader: phonemic awareness, phonics, fluency, vocabulary, and comprehension. *Reading & Writing Quarterly*, 25, 119-124.
- Rupley, W. H., Blair, R. T., Nichols, W. D. (2009). Effective reading instruction for struggling readers: the role of direct/explicit teaching. *Reading & Research Quarterly*, 25, 125-138.
- Rupley, W. H., Logan, J. W., Nichols, W. D. (1999). Vocabulary instruction in a balanced reading program. *The Reading Teacher*, 52(4), 336-346.
- Rupley, W. H. & Nichols, W. D. (2005). Vocabulary instruction for the struggling reader. *Reading & Writing Quarterly*, 21, 239-260.
- Simmons, D. Hairrell, A., Edmonds, M., Vaughn, S., Larsen, R., Willson, V., Rupley, W., & Byrns, G. (2010). A comparison of multiple strategy methods: effects on fourth-grade students' general and content-specific reading comprehension and vocabulary development. *Journal of Research on Educational Effectiveness*, 3(2), 121-156.

- Spracher, M. M. (2000, April 25). Learning about literacy: SLPs play key role in reading, writing. *The ASHA Leader*.
- Spencer, B. H. & Guillaume, A. M. (2006). Integrating curriculum through the learning cycle: content-based reading and vocabulary instruction. *The Reading Teacher*, 60(3), 206-219.
- Stahl, S. (1986). Three principles of effective vocabulary instruction. *Journal of Reading*, 29(7), 662-668.
- Stahl, S. & Fairbanks, M. (1986). The effects of vocabulary instruction: a model-based meta-analysis. *Review of Educational Research*, 56(1), 72-110.
- Stanovich, K. E. (1986). Matthew effects in reading: some consequences of individual differences in the acquisition of literacy. *Reading Research Quarterly*, 21, 360-407.
- Tannenbaum, K. R., Torgesen, J. K., & Wagner, R. K. (2006). Relationships between word knowledge and reading comprehension in third-grade children. *Scientific Studies of Reading*, 10(4), 381-398.
- Taylor, B. D., Mraz, M., Nichols, W. D., Rickelmean, R. J. & Wood, K. D. (2009). Using explicit instruction to promote vocabulary learning for struggling readers. *Reading & Writing Quarterly*, 25, 205-220.
- Ukrainetz, T. A. & Fresquez, E. F. (2003). "What isn't language?": a qualitative study of the role of the school speech-language pathologist. *Language, speech, and hearing services in schools*, 34, 284-298.
- Verhoeven, L. & Van Leeuwe, J. (2008). Prediction of the development of reading comprehension: a longitudinal study. *Applied Cognitive Psychology*, 22, 407-423.
- Walberg, H. J., & Tsai, S. (1983). Matthew effects in education. *American Educational Research Journal*, 20, 359-373.
- Warren, S. F., Fey, M. E., & Yoder, P. J. (2007). Differential treatment intensity research: a missing link to creating optimally effective communication interventions. *Mental Retardation and Developmental disabilities research reviews*, 13, 70-77.
- Webb, S. (2007). The effects of repetition on vocabulary knowledge. *Applied Linguistics*, 28(1), 46-65.